3 HUMAN BEINGS – LAND USE

3.1 INTRODUCTION

1 This chapter of the Environmental Impact Statement (EIS) presents an evaluation of the proposed development as set out in Chapter 6, **Volume 3B** of this EIS, in relation to Human Beings – Land Use. The information contained within this chapter considers the land-use of the Meath Study Area (MSA) as defined in Chapter 5, **Volume 3B** of the EIS. In that regard, the evaluation considers the construction, operational and decommissioning aspects of the proposed development in the MSA.

2 This chapter sets out the methodology followed in this evaluation (refer to **Section 3.2**), describes the characteristics of the proposed development (refer to **Section 3.3**), describes the existing land use environment (refer to **Section 3.4**), evaluates potential impacts (refer to **Section 3.5**), sets out mitigation measures proposed (refer to **Section 3.6)** and describes anticipated residual impacts (refer to **Section 3.7**). Potential transboundary impacts are addressed in Chapter 9**, Volume 3B** of the EIS. Potential cumulative impacts and potential interrelationships between environmental factors are dealt with in Chapter 10, **Volume 3B** of the EIS.

3.2 METHODOLOGY

3.2.1 Scope of Evaluation

3 The scope of the evaluation of this chapter of the EIS has been confined to agriculture, forestry and horticulture. The 2012 Corine Land Cover data indicates that within a 1km corridor of the proposed project alignment 97.5% of the land is classified as agricultural (20% arable and 77.5% pasture), less than 2.5% is classified as forestry and woodland and less than 0.02% is classified as peatland. As detailed in **Chapter 2** of this volume of the EIS and also in Chapter 1, **Volume 3B** of the EIS, the proposed development has avoided the largest settlements in the MSA and is located in an area where the land use is primarily agricultural, with associated secondary land uses including food processing as well as rural settlements, enterprises and tourism.

4 The scoping opinion received from the Board (refer to Appendix 1.3, **Volume 3B Appendices** of the EIS) identified the following issues as being relevant to this chapter of the EIS:

- Assess the likely land use impact, including restrictions on existing uses such as agriculture or commercial forestry.

5 The following guidelines were referred to while preparing and writing this appraisal:

- Environmental Protection Agency (EPA) (2002). *Guidelines on the Information to be contained in Environmental Impact Statements;*
- EPA (2003). *Advice Notes on Current Practice (in the preparation of Environmental Impact Statements); and*
- Design Manual for Roads and Bridges (UK) *Vol 11, Section 2 part 5, Determining Significance of Environmental Effects* (2008), published by the UK Highway Authority.

3.2.2 Information Sources

6 The following data sources were used to inform the appraisal:

- Landowner interviews and discussions;
- Road side surveys in August 2011 and August - September 2013;
- Examination of aerial mapping information;
- Land Registry boundary data;
- Ordnance Survey field mapping;
- Central Statistics Office (CSO) data from the 2010 Census of Agriculture and;
- Other sources of information referred to include:
    - *Soils & Subsoils Class* digital data downloaded from the EPA website in September 2013;
    - Corine Land Cover Map of Ireland (2012);
    - Health and Safety Authority Ireland (2013). *Farm Safety Action Plan 2013-2015*;
    - Health and Safety Authority Ireland (2010). *Guidelines for Safe Working near Overhead Electricity Lines in Agriculture*, (http://www.hsa.ie/eng/Publications_and_Forms/Publications/Agriculture_and_Forestry;
    - Electricity Supply Board (ESB) and Irish Farmers Association (IFA) (October 1985). *Code of Practice for Survey, Construction and Maintenance of Overhead Lines in Relation to the Rights of Landowners;*
    - ESB and IFA (September 1992). *Agreement on Compensation for Loss of Tree Planting Rights;*
    - ESB Networks. *Farm Well, Farm Safely* (http://www.esb.ie/esbnetworks/en/safety-environment/safety_farm.jsp)*;* and

- *National Forestry Inventory* (2007) (Republic of Ireland) published by the Forestry Service, Department of Agriculture, Fisheries and Food.

7 The evaluation methodology involves three stages:

- A baseline appraisal was carried out. The type and size of land parcels[5] and their character is described in **Section 3.4.** The methodology of evaluation of sensitivity is explained in **Section 3.2.3**;
- An appraisal of potential impacts during construction, operation and decommissioning phases is carried out. The magnitude of potential impacts is evaluated based on criteria as set out in **Section 3.2.4**; and
- The significance of impact is provided by evaluating the sensitivity of the land parcel and magnitude of impact and is based on the criteria set out in **Section 3.2.5**.

3.2.3 Evaluation of Baseline

8 The land use appraisal for the MSA includes land parcels along the proposed development and along temporary access routes. The existing agricultural, horticultural and forestry environment is evaluated by interviewing landowners (where possible), roadside surveys and by examination of aerial photography and land registry mapping data. The 2010 *Census of Agriculture* provides comprehensive information on agricultural and horticultural farms in counties Cavan and Meath. The character of the agricultural environment is categorised by evaluating the sensitivity of each land parcel along the proposed development.

3.2.3.1 Sensitivity

9 In this evaluation, the main criterion for determining the sensitivity of a land parcel is the enterprise type. Land quality and farming intensity are also considered. The range of sensitivity values range from very low, low, medium, high and very high. The criteria for categorisation of sensitivity are shown in **Table 3.1.**

[5] A land parcel is land owned as determined from the land registry mapping. The land parcel may not be the entire holding of a landowner.

Table 3.1: Criteria for Categorisation of Sensitivity

Sensitivity Category	Enterprise Type	Characteristics
Very High	Experimental Husbandry Farms. Stud Farms (large scale equine, breeding regionally and nationally important horses). Race Horse Training Enterprises.	Rare and important on a regional or national basis. There is limited potential for substitution due to specific facilities and internal farm layout.
	Intensive Livestock enterprises (pigs and poultry), Commercial tree plantations, Intensive Horticultural enterprises.	Very high potential for change if a tower or OHL is located on these enterprises. In the case of pig and poultry farms there is a limited potential for substitution due to difficulty in obtaining suitable alternative sites.
	Commercial Forestry Plantations.	Very high potential for change within a 74m wide corridor of the OHL in commercial forestry.
High	Dairy farms. Equine enterprises (Significant enterprise on the farm but not including intensive Stud Farms).	Any impact that restricts the movement of livestock to and from the farm hub will have a high potential to cause change. These farms generally have a specific grazing paddock layout to allow access to the farm yard – which is difficult to substitute.
Medium	Beef farms, Sheep farms. Equine Enterprises (not a significant enterprise on the farm).	The potential for change is lower than dairy farms because livestock generally do not have to be moved on a daily basis and the grazing layout requirement is less rigid than on dairy farms.
	Tillage and field cropping, grass cropping farms (hay or silage)	Crops and cropping programmes are less sensitive to change in the longer term. There is less restriction on substituting the land in these enterprises.
Low	Rough Grazing and Commonage, Low Stocking rate.	The potential for change is low because the scale or intensity of enterprise is so low that there is a low response to impacts.
Very Low	Little or no agricultural activity e.g. Woodland, Bog.	The potential for change is very low because the scale or intensity of enterprise is so low that there is a very low response to impacts.

(Source: Table 3.1 is based on the EPA guidelines 2002 and the *Design Manual for Roads and Bridges (DMRB) 200*8. The EPA guidelines 2002 define sensitivity as the "*Potential of a receptor to be significantly changed*". The concepts of Importance, Rarity and Potential for Substitution are introduced in Table 2.1 Volume 2, Section 2, part 5 of DMRB 2008).

10 Sensitivity may vary from indicated values due to professional judgement and depending on site specific factors. Examples of such site specific factors include:

- The presence of specialised facilities on affected land parcels e.g. dog training tracks and horse race / training tracks; and
- Where land parcels have livestock or crops which have a value or importance which is above the normal for this type of farm, the sensitivity value may be increased. Possible examples are experimental sites and rare breeds.

3.2.4 Evaluation of Magnitude of Impacts

11 The elements of the proposed development which will cause potential impacts on the agronomy environment are identified in **Section 3.5**. The magnitude of the impact is the scale of impact due to the proposed development and are assigned values ranging from very low to very high. The probability and duration of occurrence is also considered. The criteria and methodology for evaluation of impact magnitude are set out in **Table 3.2**.

Table 3.2: Criteria and Methodology for Evaluation of Impact Magnitude

Magnitude	Determining Criteria
Very High	A permanent restriction on the operation of a land parcel or site where the location of towers or OHL permanently restricts a vital operational aspect of an enterprise. For example a permanent change in land or forest area of approximately 15% (or more) or the removal of critical buildings or the restriction of access to an intensive enterprise (e.g. pigs, poultry, horticulture).
High	A permanent restriction on the operation of a land parcel or site where the location of towers or OHL permanently restricts an important operational aspect of an enterprise. For example a permanent change in land or forest area of approximately 10-15% or the removal of standard cattle or sheep buildings in a conventional farmyard. Construction phase impacts without mitigation could in rare situations have a high magnitude of impact (e.g. significant damage to land drainage, allowing livestock to stray onto public roads).
Medium	A permanent restriction on the operation of a land parcel or site where for example a permanent change in land or forest area of approximately 5-10%. Where access to land or farmyard is restricted but there is alternative access. Where the development of, or expansion of, a farmyard is restricted but there is alternative land available for this development. Construction phase impacts without mitigation will generally result in medium magnitude impacts (for example poor re-instatement of fences of land, rutting along access routes not being reinstated or levelled).
Low	A permanent change in land or forest area of approximately 1-5%. The presence of multiple tower sites and a central alignment of the OHL will tend to give a low impact.
Very Low	A permanent change in land or forest area of approximately 1% (or less). The presence of one tower site in an average sized land parcel and an alignment of the OHL at the edge of the farm will tend to give a very low impact.

(Source: Based on author's experience in assessing magnitude and significance of impacts.)

12 The criteria in **Table 3.2** are indicative and are subject to a qualitative evaluation of impact based on professional judgement. Consideration is also made as to the likelihood, frequency and probability of an impact occurring.

3.2.5 Evaluation of Significance of Project

13 The significance of the impact is the importance of the outcome of the impact or the consequences of the change. The EPA *Advice Notes on Current Practice (in the preparation of Environmental Impact Statements)* (September 2003) contain guidelines for describing the significance of impacts. The significance of impact is determined by evaluating the magnitude of the impact and the sensitivity of the affected land parcel. **Figure 3.1** gives a guide for determining the level of significance of impact.

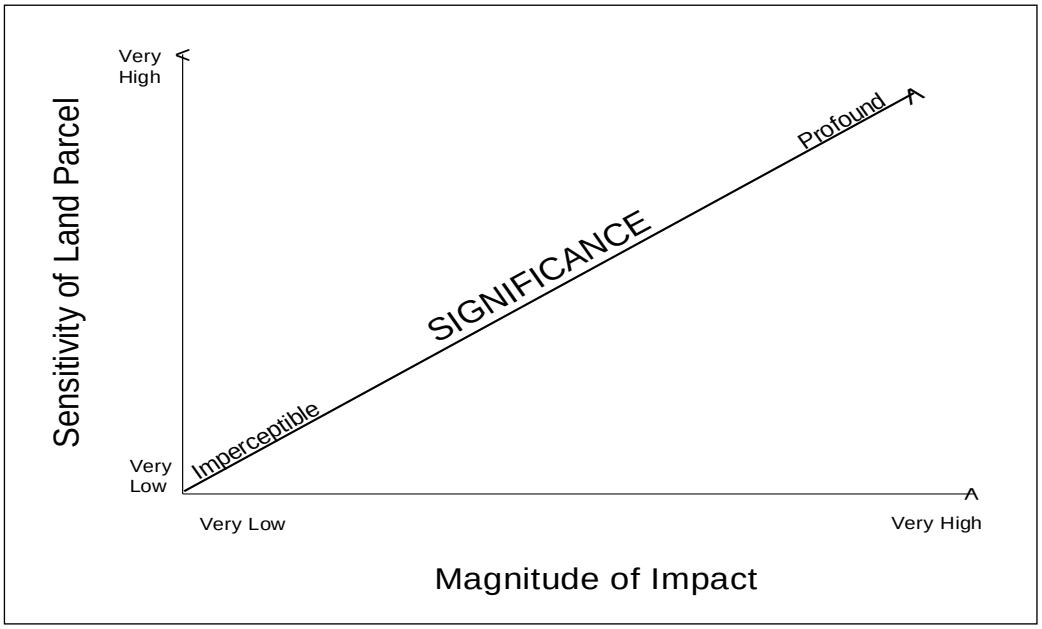

Figure 3.1: Significance of Land Parcel Impacts[6]

14 The significance of the impacts is described as follows:

- An 'Imperceptible' impact is either an impact so small that it cannot be measured or is capable of measurement but without noticeable consequences;
- A 'Slight Adverse' impact causes noticeable changes in the operation of an enterprise on a land parcel in a minor or slight way;

[6] Based on Design Manual for Roads and Bridges (UK) Vol 11, Section 2 part 5, Determining Significance of Environmental Effects (2008, published by the UK Highway Authority).

- A 'Moderate Adverse' impact changes a land parcel causing operational difficulties that require moderate changes in the management and operational resources;
- A 'Major Adverse' impact changes a land parcel so that the enterprise cannot be continued, or if continued will require major changes in management and operational resources; and
- A 'Profound Impact' changes the land parcel in a way that it obliterates the land parcel enterprise.

3.2.6 Consultation

15 The Department of Agriculture, Food and the Marine (DAFM) and ESB were consulted in relation to the proposed development. In addition, all landowners along the proposed route alignment were written to and offered an agricultural assessment. (Refer to the *Public and Landowner Consultation Report* in **Volume 2B** of the application documentation and Chapter 3, **Volume 3B** of this EIS for details on scoping and statutory consultation).

3.2.7 Difficulties Encountered

16 These issues are dealt with in the Public and Landowner Consultation Report in Volume 2B of the application documentation and Chapter 3, Volume 3B of the EIS for details on scoping and statutory consultation. The majority of the landowners along the proposed alignment chose not to engage with the agronomist which presents the following difficulties.

Difficulty Confirming the Full Extent of Landowner's Farms

17 Land registry mapping is available for all of the proposed alignment and along the proposed temporary access routes. Reliance on land registry mapping as the only source of information on land ownership will lead to both an overestimation of the number of farmers affected and an underestimation of the area farmed (e.g. some of the land farmed may be registered in a spouse's name or in a relative's name). The magnitude of impact in this EIS is partly based on the percentage of the land parcel restricted under the towers, at working sites and along temporary access routes. The consequence of underestimating areas of land farmed is that the magnitude of impact tends to be overestimated. This is an acceptable consequence in the context of this proposed development where the impacts are generally low.

Difficulty Confirming Enterprise Types

18 The standard practice in land use assessments is to categorise the baseline sensitivity. Farm enterprise is an important criteria in this categorisation. This information is generally obtained from a combination of landowner interviews, roadside surveys and examination of aerial

photography. The consequence of incorrectly identifying a high sensitive farm as medium sensitive is that the significance of impact would be underestimated (refer to **Figure 3.1**). However the author is satisfied that the evaluation of land parcel sensitivity is adequate based on the following reasons:

- Roadside surveys and examination of aerial photography have accurately identified very high sensitive land parcels (e.g. commercial forests, stud farms, poultry farms, Teagasc experimental husbandry farms and intensive horticultural enterprises with glass houses & poly tunnels);

- The main difficulty encountered is determining whether grass enterprises were medium sensitivity (beef and or sheep) or high sensitivity (dairy and equine) in situations where livestock were not seen on the land parcel. In order to assess sensitivity in these situations other aspects of the land parcel were examined such as, presence of a farm yard, presence of stables, presence of milking facilities, presence of access suitable for a milk lorry, access into adjoining land parcels (if any) and a well-developed farm paddock system;

- An evaluation was conducted for each land parcel; and

- The 2010 *National Census of Agriculture* is referred to, which provides an accurate description of the baseline environment and therefore the expected enterprise mix along the proposed alignment.

Difficulty in Specifying Land Use Mitigation Measures for Inclusion in the Design, Construction and Operation of the Proposed Development

19 The nature of the proposed development is different from road infrastructural projects because farms are not divided and access is not significantly affected. The land utilisation under the OHLs will not change significantly. The impacts are lower than for road infrastructural projects and there is no requirement for constructed accommodation works for land use purposes. In common with other infrastructural projects, this proposed development reduces overall impact by minimising the overall length, minimising the number of towers and avoiding farm yards. Therefore, although engagement with landowners is desirable, the design of the proposed alignment is not as reliant on landowner engagement as road projects. For this development if landowners engaged with the project team then additional land use mitigation could have been provided (e.g. placing towers on some field boundaries) and alternative locations for temporary access routes could be specified. While this may result in outcomes that are more satisfactory for landowners, it would result in a lower impact in a very small number of cases. Therefore the consequence due to limited landowner engagement on the design of the proposed development is not significant from a land use point of view. The construction and operation mitigation measures are informed by the author's own experience as an agricultural consultant and

reference is made to the ESB / IFA agreement. There is no significant consequence due to limited landowner engagement on construction and operation mitigation measures.

3.3 CHARACTERISTICS OF THE PROPOSED DEVELOPMENT

20 The characteristics of the proposed development which have the potential to create impacts on land uses arise from the specific locations of towers and the OHL on lands.

21 During the construction phase, the construction sites around the towers, guarding locations, the stringing sites and the temporary access routes have the potential to cause adverse, albeit largely temporary effects. There will be potential disturbance where trees are located within their falling distance from the OHL infrastructure and where these need to be felled. Forestry plantations within a maximum 74m wide corridor will be cleared. A detailed description of the proposed development and how it will be constructed is presented in Chapters 6 and 7, **Volume 3B** of this EIS.

3.4 EXISTING ENVIRONMENT

3.4.1 Land Use along the Proposed Alignment

22 The MSA is shown in Figures 3.2 - 3.12, **Volume 3D Figures** of the EIS. **Table 3.3** presents and compares the CSO *2010 Agricultural Census* (hereinafter referred to as the 2010 Census) statistics and data from the agricultural evaluation.[7]

Table 3.3: Agricultural and Forestry Statistics for County Meath, the State and Land Parcels evaluated along the Proposed Alignment

	Typical Sensitivity	Statistics for County Meath	State Statistics	Evaluated Land parcels
Average size (ha)	-	42	32.7	26.5
Number of land parcels / farm	-	3.2	3.8	-
Dairy Farms (% of total number)	High	10%	11%	76.5[8]%
Beef, sheep, silage & hay farms (% of total number)	Medium	79%	83%	
Tillage farms (% of total number)	Medium	8%	3%	14%
Mixed crops and livestock farms (% of total number)	Medium	2%	2%	3.5%

[7] Statistics for County Cavan can be found in Chapter 3 of **Volume 3C** of the EIS.
[8] Excluding forestry and based on visual inspections of land parcels along the proposed project alignment and contact with landowners – 8.5% are dairy, 38% are beef and / or sheep, 30% are unconfirmed grass enterprises and hay and silage.

	Typical Sensitivity	Statistics for County Meath	State Statistics	Evaluated Land parcels
Other enterprises (e.g. pigs, poultry, horticultural cropping, equestrian as the main enterprises) (% of total number)	High	1%	1%	6%
Forestry (% of total land area)	Very High	5%	10%	6%
Horticultural area (vegetable crops, fruit, nursery, other crops – Table 7D of 2010 census) (% of total area)	High - Very High	0.4%	0.2%	0.2%

(Source: The data in the last column is based on the author's evaluation of land parcels along the proposed development. Data in the remaining columns is based on the *National Forestry Inventory* (2007) (Republic of Ireland) published by the Forestry Service, Department of Agriculture, Fisheries and Food and 2010 Census of Agriculture (CSO)).

23 The 2010 census data for County Meath gives a good indication of the agricultural and horticultural holdings along the proposed development within County Meath.

- Farms in County Meath are larger than the average farm in the state (42ha vs 32.7ha – Table 1 of 2010 Census);
- Farms in County Meath will have just over three separate land parcels per farm (Table 28 of 2010 Census);
- The standardised economic output per farm (Table 3 of 2010 Census) is €46,500 in County Meath compared to the state average of €30,700 (and €47,400 for surrounding counties);
- On average there are 1.3 standard work units employed on County Meath farms compared to 1.2 work units in the state (Table 38 of 2010 Census). Farming is the sole or major occupation of two thirds of County Meath farmers which is similar to the state (Table 36 of 2010 Census); and
- Compared to the state there is a lower proportion of grass type farms and higher proportion of tillage farms in County Meath. The percentage area of horticultural crops is higher and the percentage area of forestry is lower in County Meath. Table 7D of the 2010 Census indicates that the area sown to potatoes is approximately 1.3% of the total area of County Meath farms compared to 0.2% of the state. Table 8D of the 2010 Census indicates that 10% of farms in County Meath will have brood mares with an average of approximately three mares per farm (this is similar to the state average).

Approximately 0.4% of the land in County Meath is sown with horticultural crops (vegetables, fruit, nursery & other crops) compared with 0.2% of the state area.

24 A total of 180 land parcels are evaluated for impacts along the proposed development. The potential impacts on these land parcels is summarised in **Appendix 3.1, Volume 3D Appendices** of the EIS. The land parcel enterprises evaluated along the proposed alignment are as follows:

- 66 are beef and /or sheep enterprises;
- 15 are dairy enterprises;
- 51 are grass land parcels where the farm enterprise is unconfirmed or are used solely for hay or silage;
- 24 are tillage enterprises;
- Six are mixed crops & livestock enterprises;
- Six are equine enterprises (LMC- 023, 046, 058, 059, 099 and 132);
- Four are other enterprises (one grass plot adjoining a dwelling, 2 poultry and livestock enterprises, one horticultural enterprise (LMC-029)); and
- Eight are forestry enterprises (LMC-067, 105, 110, 157, 170, 171 and 196). LMC-135 is a forestry and equine enterprise.

3.4.2 Soils Types in Land Parcels along the Proposed Alignment

25 In this section reference is made to *Soils & Subsoils Class* digital data downloaded from the EPA website in September 2013[9]. The main soil types of land parcels along the proposed development in the MSA are:

- Approximately 50% of soil in land parcels is a mineral soil EPA Code 1. This is categorised as a deep well drained good quality soil. It is the dominant soil in land parcels between Tower 265 (Altmush / Brittas) and Tower 285 (Drakerath) and between Towers 336 (Halltown) and 373 (Branganstown). This soil type also occurs in parts of Dowdstown, Glebe, Castlemartin and Irishtown.

[9] Prepared by the Teagasc Spatial Analysis Group at Kinsealy Research Centre (in collaboration with EPA, Department of the Environment, Heritage and Local Government, Forest Service and GSI.

- Approximately 30% of soil in land parcels is a mineral soil EPA Code 3. This is categorised as a deep heavy soil which generally has poor drainage characteristics. However this soil can be drained and the majority of this soil type along the proposed development is good quality grassland. It is the dominant soil in land parcels between Towers 237 (Clonturkan) and 256 (Boynagh (ED Kilmainham), between Towers 328 (Betaghstown) and 333 (Irishtown) and between Towers 381 (Martinstown / Derrypatrick) and 410 (Woodland).

- Approximately 10% of soil in land parcels is a mineral soil EPA Code 2. This is categorised as a shallow well drained good quality soil. It is the dominant soil in land parcels between Towers 374 to 381 (Branganstown / Boycetown) and occurs to a lesser extent between Towers 259 (Altmush) and 270 (Brittas), between Towers 345 and 351 (Dunlough / Balbrigh) and near Tower 387 (Derrypatrick).

- Approximately 5% of land in land parcels is bog and wet peaty type soils EPA Codes 4 and 6. These soils occur mainly in land parcels between Towers 286 (Drakerath) and 292 (Fletcherstown).

- Approximately 5% of land in land parcels is described as Alluvial EPA Code 5. These soils occur along rivers and streams and may be of variable quality depending on whether they have been successfully drained or not.

26 The visual evaluation of land parcels along the proposed development in County Meath suggests that the majority of the land is good quality. From Clonturkan to Clooney / Raffin (between Towers 237 and 280) the topography is hilly (southern part of drumlin belt). Between the N52 and Woodland the topography is generally flat or rolling lowland. Artificial land drainage systems are a feature of the land along the line route.

3.4.3 Categorisation of Land Parcels

27 The results of the evaluation and categorisation of agricultural land parcels along the proposed development in the MSA are shown in **Appendix 3.1, Volume 3D Appendices** of the EIS. These land parcels are categorised based on the criteria described in **Section 3.2.3**. The sensitivity of land parcels along the proposed development is as follows:

- 5% (9 No.) are categorised as very high sensitivity. These include one horticultural land parcel (Ref. No. LMC-029), Teagasc experimental husbandry farm (Ref. No. LMC-022) and 6 land parcels where commercial forestry primarily is affected (Ref. Nos. LMC- 067, 110, 157, 170, 171 and 196). Land parcel LMC-135 has a forestry and equine enterprise.

- 14.5% (26 No.) are categorised as high sensitive with 15 dairy enterprises, 2 poultry and other livestock farms (Ref No LMC-111 and LMC-116), 2 beef and forestry enterprise (Ref. No. LMC-105 and LMC-158), 4 equine enterprises (Ref. Nos. LMC-023, 046, 059 and 132 & 214 & 215) and 3 unconfirmed grass enterprises (LMC- 065 & 079, 120 and 137).

- 80% (144 No.) are categorised as medium sensitivity. These are cattle, sheep, grass crops, tillage and mixed grassland and tillage farms. Two equine enterprises are classed as medium sensitivity (Ref. No. LMC-058 and LMC-099).

- 0.5% (1 No.) is categorised as low sensitivity (Ref. No. LMC-096).

3.5 POTENTIAL IMPACTS

3.5.1 Do Nothing

28 In the case of the 'Do Nothing Scenario' there would be no negative impacts on the environment and there would be no change to the existing environment.

3.5.2 Construction Phase

29 The construction phase impacts are those impacts that may potentially affect land parcels during the projected 36 month period of the construction programme. Chapter 7, **Volume 3B** of the EIS describes the five stages of the construction programme for the OHL. The stages are summarised here:

- Stage 1 – Preparatory Site Work (1 – 7 days);

- Stage 2 – Tower Foundations; standard installation (3 – 6 days), pilling installation (5 – 10 days);

- Stage 3 – Tower Assembly and Erection and Preliminary Reinstatement (3 – 4 days);

- Stage 4 – Conductor / Insulator Installation (7 days); and

- Stage 5 – Final Reinstatement of Land (1 – 5 days).

30 Taking the maximum duration of works figures for stages 1 – 5 above, the construction work at one tower should be completed within 32 days or 1 month. However, because the contractor will be working on several tower locations at one time, the construction work will be spread over a six to eight week period at each tower site, up to stage 3. After stage 3 there will be a period of inactivity until stage 4 and 5 works are completed at a later date.

31 In addition to the works along the proposed tower locations and OHL, construction works will also take place within the existing substation site at Woodland. This construction work will take place within the existing site boundary.

3.5.2.1 Construction Traffic

32 The construction vehicles required for stages 1 – 3 are described in Chapter 7, **Volume 3B** of the EIS. Typical vehicles accessing agricultural land are; 4x4 jeep, 360˚ tracked excavator (up to 22 tons), wheeled dumper or track dumper (up to 8 tons), transit van, cement lorry (up to 38 tons) or dumper if ground conditions and terrain are not suitable, goods lorries and tractor and trailer.

3.5.2.2 Construction Impacts

33 The potential impacts during the construction phase are as follows:

- Wheel rutting and compaction along temporary access routes and at construction and winching sites will cause damage to soil at all stages of the construction programme. Rutting will restrict machinery operations such as fertiliser spreading, spraying and harvesting. The damage will be dependent on ground conditions and weather. Damage will be worst at tower construction sites.

- There is the potential for general disturbance to farm enterprises at all stages of the construction programme. Construction activities and traffic could interfere with users of existing and temporary access routes and could generate noise and dust. The movement of construction traffic could disturb livestock. Grazing livestock are generally familiar with the landowner and his machinery and may be disturbed when different machinery and personnel are introduced on to a farm particularly horses, young cattle and suckler cows. As well as the land lost to arable crops and grassland, temporary access routes and construction sites may cause temporary separation or unavailability of land. For example, access for dairy cows to a milking parlour or access for livestock to water sources could potentially be interfered with. In the unlikely event that rock breaking or piling is required the resulting loud sudden noise could cause a 'fight or flight' response in livestock. There is an increased risk of livestock escaping via new temporary access points or due to gates being left open or failure to make fences stock proof. Farming operations may be interrupted or take longer to complete as a result of the construction activity. Landowners may have to spend additional time organising their farm enterprise.

- At construction stage 1 disturbance may occur as a result of the preparation of the tower construction areas and temporary access routes.

- There is an increased risk of spreading animal and crop diseases (soil borne crop diseases) due to personnel and machinery moving between farms at all stages of the construction programme. Construction machinery using existing tracks / roads or accessing land through farm yards increases the risk of spreading farm diseases because the construction machinery may encounter accumulations of animal manure. Construction machinery may inadvertently spread soil borne diseases particularly in potato and vegetable cropped fields.

- The construction of the proposed development may have direct impacts on Area Based Farm Payments (e.g. Areas of Natural Constraint (ANC) Payment Scheme, 2015 Basic Payment Scheme (BPS) and 2015 Greening Payment Scheme). These payments are dependent on the Utilisable Agricultural Area (UAA) which in certain situations will be reduced due to temporary access routes and construction sites. The implementation of Nitrates Regulations on farms is sensitive to reductions in UAA. The payments of other farm schemes such as the Agricultural Environmental Options Scheme (AEOS) and Green, Low-carbon Agri-Environmental Scheme (GLAS) are also based on the UAA. Certain Agri-Environmental Options may be affected by the location of temporary access routes and construction sites (e.g. Species Rich Grassland Option and Traditional Hay Meadow Option). In the case of Area Based Payment Schemes and Nitrates Regulations the reduction in UAA due to the proposed development is generally less than 1-2% of the area farmed and the larger area reductions are generally temporary (e.g. at tower construction sites). In relation to Agri-Environmental Schemes the DAFM will review individual cases on a case by case basis.

- Tree felling in forestry plantations would have a very low to very high impact depending on the proportion of the plantation felled. Opening up the plantation may increase windfalls. Beside the provision of stock proof fencing, the only mitigation is compensation. The cleared land can in certain situations be sown with grass.

- At construction stages 1 and 3 there is the potential for land drains to be disturbed during excavation.

- At the tower construction sites any spillages of fuel oil could contaminate soil and surface water.

- In construction stage 2 spillages of concrete may occur which could contaminate soil and surface water.

- Any potential surface water runoff from soil excavations in to water courses could temporarily contaminate drinking sources for cattle.

- There is one line crossing which will require alterations to existing OHL structures. It is located between towers 307 and 308 (Teltown and Gibstown Demesne in County Meath) where the proposed development will cross the existing Arva - Navan 110 kV line. This will require replacing two existing 110 kV polesets (No. 314 & No. 315) with new wood polesets. The two replacement polesets will be erected immediately adjacent to the butt of the old wood poles and the existing structures will then be retired. Therefore there will be two additional work sites along the existing 110 kV line - similar in scale to guarding locations. The minimum ground clearance for a 110 kV conductor of 7 m will be maintained for the Arva - Navan 110 kV line. The combined impact of the modification to the existing 110 kV line and the construction of the 400 kV line will result in imperceptible impacts on three land parcels (LMC-097B, LMC-097C and LMC-099) and a slight adverse impact on one land parcel (LMC-097A and LMC-098).

34 Where the mitigation measures identified in this EIS are implemented, the significance of these construction phase impacts in **Appendix 3.1**, **Volume 3D Appendices** of the EIS may be summarised as:

- 142land parcels in the MSA are predicted to have an imperceptible impact – 79% of total number;
- 32 land parcels in the MSA are predicted to have a slight adverse impact – 18% of total number;
- Four land parcels in the MSA are predicted to have a moderate adverse impact – 2% of total number (Ref. Nos. 105, 110, 157 and 171 - all forestry plots);
- Two land parcels in the MSA are predicted to have a major adverse impact – 1% of total number (Ref. Nos. 067 and 170 - forestry plots); and
- There are no profound construction impacts.

35 The evaluated significance is relatively low and is dependent on the temporary nature of construction impacts. In line with EPA guidance, temporary impacts have a lower significance than permanent impacts. Without mitigation the impacts would be longer term in nature and therefore the significance would increase dramatically. Construction traffic will have to use existing private farm tracks to access working areas. The impact on land parcels along these tracks is evaluated to be imperceptible.

3.5.3 Operational Phase

36 The potential impacts during the operational phase are as follows:

3.5.3.1 Noise Impacts

37 Noise sources from the OHLs are described in detail in **Chapter 9** of this volume of the EIS. These noise sources include operational noise sources from the OHLs and noise generated during maintenance works.

3.5.3.2 Permanent Disturbance

38 Permanent disturbances as a result of the proposed development are:

- Maintenance works will cause infrequent disturbance during the operational phase (Chapter 7, **Volume 3B** of the EIS). Emergency patrol crews may have to access land, particularly after extreme weather events. Routine maintenance work involves foot patrols to examine OHLs and towers every five years, tower painting at approximately 35 to 40 years and replacement of 25% of shield wire and 5% of insulators at approximately 30 years. Routine maintenance work, as carried out on the existing OHL network, may result in very low levels of disturbance.

- The towers will be a physical obstacle to farm machinery operations. In grassland fields the bases of the towers may be grazed but it will not be possible to reseed or manage them to their full potential. Silage will not be harvested from the area directly under the tower and there will be small inaccessible areas around the tower where silage may not be harvested. In tillage fields there will be uncropped areas under and around the towers;

- The area under the towers may act as a reservoir for weeds species, some of which are referred to in the Noxious Weeds Act and therefore place an extra responsibility on landowners to control them.

- The construction activity at the tower, guarding and stringing sites and traffic along temporary access routes will cause soil damage which will be evident in the medium term during the operational phase.

- The presence of the towers and OHLs will have direct impacts on the operation of farm schemes during the operational phase. Area Based Payments are dependent on the UAA which in certain situations will be reduced due to the presence of towers. The implementation of Nitrates Regulations on farms is sensitive to reductions in UAA. The payments of other farm schemes such as the AEOS and GLAS are also based on the UAA. Certain Agri-Environmental Options may be affected by the location of towers

(e.g. Species Rich Grassland Option and Traditional Hay Meadow Option) and tree planting options may be affected under the OHLs. In relation to Agri-Environmental Schemes the DAFM will review individual circumstances on a case by case basis and if possible alternative sites on the farm will be agreed with the landowner (e.g. for tree planting options).

3.5.3.3 Farmyard Development

39 The presence of the OHL may restrict construction of some agricultural and horticultural buildings.

3.5.3.4 Impact on Commercial Forestry

40 The presence of the OHL will cause a permanent reduction in the area of forestry and tree plantations (which can often be replaced with grass land).

3.5.3.5 Health and Safety Risks

41 The minimum ground clearance to the proposed 400 kV OHL will be 9m and the minimum ground clearance, following modifications, to the existing 110 kV OHLs will be 7m. In general most farm machinery activities can take place safely under these electricity lines (e.g. fertilising, low trajectory slurry spreading, spraying, crop harvesting) but there may be unacceptable risks associated with transporting exceptionally high loads (e.g. bales), irrigating crops with rain guns, high trajectory spreading of slurry and using machinery with loader attachments under the electricity lines.

3.5.3.6 Electric and Magnetic Fields

42 Electric and Magnetic Fields (EMF) are described in **Chapter 5** of this volume of the EIS. There are no known adverse effects on livestock or crops as a result of EMF.

3.5.4 Decommissioning

43 The proposed development will become a permanent part of the transmission infrastructure. The expected lifespan of the development is in the region of 50 to 80 years. This will be achieved by routine maintenance and replacement of hardware as required. There are no plans for the decommissioning of the OHL. In the event that part of, or the entire proposed infrastructure is to be decommissioned, all towers, equipment and material to be decommissioned will be removed off site and the land reinstated. Impacts would be expected to be less than during the construction phase and would be of short term duration.

3.6 MITIGATION MEASURES

3.6.1 Construction Phase

44 During the design phase impacts have been mitigated by minimising the number of towers having regard to requirements imposed by technical and environmental constraints and constructing an OHL development that is structurally sound and safe.

45 Tower sites have been located away from farm yards where possible and all reasonable efforts were made to involve landowners in discussions regarding location of towers.

46 Prior to commencement of work the construction contractors will prepare method statements and work programmes in relation to the detailed phasing of work in line with the phasing outlined in the application documentation. A wayleave agent will be appointed by the contractor to liaise with the landowners along the line route and ensure that their requirements for entry are met so far as is possible and that landowners are made aware of the schedule of works to be carried out on their land.

47 All employees and contractors involved in the construction phase will receive adequate training in particular in relation to issues relating to livestock safety and bio security on farms.

48 Landowners will be notified in advance of the commencement of construction.

49 The contractor will ensure that landowners have reasonable access to all parts of their farm during the construction phase.

50 Disease protocols will be adhered to. As referenced in the ESB / IFA agreement the contractor will comply with any DAFM regulation pertaining to crops and livestock diseases.

51 Where required, fencing will be erected to exclude livestock from construction sites.

52 In most situations mitigation measures for noise will not be required during the construction phase. This is because livestock will quickly adapt to changes in their noise environment. In the unlikely event that rock breaking or pilling are required owners of livestock in adjoining fields will be notified in advance.

53 It will be construction policy to minimise non tracked vehicular access to sites in wet weather. Temporary aluminium or panel tracks will be used in certain situations to prevent damage to soil (see Chapter 7, **Volume 3B** of the EIS).

54 Excavations will be minimised. The locally excavated material will be reinstated surrounding the tower base following construction. All unused excavated fill will be removed from the site and disposed of at a licensed waste facility.

55 Affected land drains will be redirected in a manner that maintains existing land drainage.

56 Where top soil is stripped back it will be replaced. All disturbed field surfaces will be re-instated.

57 Any losses or additional costs incurred by the landowner which are directly attributed to the proposed development, during the construction phase or the operational phase, including additional necessary remedial works and including losses and or additional costs arising from implementation of Area Based Payment Schemes, Nitrates Regulations and Agri-Environmental Schemes will be paid to the landowner as per the ESB / IFA agreement.

58 Mitigation relating to potential effects on water quality and soil contamination due to fuel or concrete spillages are detailed in **Chapters 7** and **8** of this volume of the EIS.

59 Mitigation measures to be outlined in the Construction and Environmental Management Plan (CEMP) in relation to land use will be implemented as part of the construction management. A summary of all mitigation measures are detailed in Chapter 11, **Volume 3B** of the EIS.

3.6.2 Operational Phase

60 The OHL infrastructure will be inspected and maintained as set out in Chapter 7, **Volume 3B** of the EIS.

61 Disease protocols will be adhered to during maintenance works.

62 ESB will provide safety information directly to all affected landowners e.g. HSA *Guidelines for Safe Working near Overhead Electricity Lines in Agriculture* and ESB Networks *Code of Practice for Avoiding Danger from Overhead Electricity Lines in Agriculture*. These publications will enable farmers to fulfil their statutory requirements under Health and Safety Regulations.

63 For general operational noise there is no practical mitigation (refer to **Chapter 9** of this volume of the EIS), but the potential impacts on agricultural activities from noise is negligible. During maintenance works mitigation will involve notification to landowners in advance of any construction activity.

64 Helicopter inspections will be announced in local newspapers and the Farmer's Journal.

65 Other damage and disturbance impacts which cannot be mitigated directly by the contractor will be addressed in the statutory compensation process. For example the land at construction sites and along temporary access routes may require subsoiling, ploughing and reseeding a few years after the construction period, if crop re-establishment is not satisfactory. Annual payments will be paid to landowners for the interference caused by the towers on their land.

3.7 RESIDUAL IMPACTS

66 Agronomy residual impacts are discussed under three headings;

- Residual Impacts at a national and regional level;
- Residual Impacts along the proposed development in the MSA; and
- Residual Impacts on individual land parcels.

3.7.1 Residual Impacts at a National and Regional Level

67 The area of agricultural land (excluding commonage) in County Cavan is 139,374ha and in County Meath is 191,846ha (2010 census data). The combined area of both counties is approximately 7% of the national agricultural area.

- The area of land beneath the towers in County Cavan (within the MSA) will be approximately 0.06ha. There will be short to medium term impacts due to damage to soil on approximately 0.4ha at construction sites and along temporary access routes. The impact is imperceptible based on the low percentage of total area affected.
- The area of land beneath the towers in County Meath will be approximately 3.42ha. When additional wastage is allowed around towers in tillage fields this area increases to 4.2ha. In addition to this 14.6ha of commercial forest (0.15% of the area of forest in County Meath) will be cleared within a 74m corridor centred on the OHL. There will be short to medium term impacts due to damage to soil on approximately 56.5ha at construction sites, guarding locations and along temporary access routes. The impact is imperceptible based on the low percentage of total area affected.
- There will be no significant change in land use due to the location of the proposed OHLs.

68 Overall the significance of residual impact on a regional or national level will be imperceptible.

3.7.2 Residual Impacts along the Proposed Developed within the MSA

69 The impact on the study area (approximately 4,710ha) within the MSA, which consists of all the land parcels (No. 180) along the proposed development, is evaluated to be imperceptible based on the following:

- The area of land beneath and around the tower bases is approximately 4.2ha which is approximately 0.1% of the area of land parcels along the proposed alignment within the MSA.

- There will be short to medium term impacts due to damage to soil on approximately 57ha at construction sites, guarding locations and along temporary access routes and approximately 14.6ha of forestry will be cleared. Therefore there will be direct impacts on approximately 1.5% of the area of land parcels along the proposed alignment within the MSA.

- There will be no significant change in land use under the OHLs on land parcels along the proposed development.

3.7.3 Residual Impacts on Individual Land Parcels

70 The land parcel impacts in the operational phase are due to land use restrictions at tower sites, short to medium term damage caused to land during the construction phase, long term inconvenience and additional safety risk caused by presence of the electricity lines and towers and potential impacts caused to farm yards. Disturbance due to maintenance works will also contribute to land parcel impacts. Construction phase disturbance impacts are general short term (1–3 years) and with mitigation there should be no residual impact. Impacts due to damage to soil are short to medium term (5–15 years; based on author's experience) and with mitigation lands can be restored to pre-construction condition. Impacts due to loss of land beneath the towers and impacts due to OHLs are permanent (>60 years). Intermittent disturbance due to maintenance works during the operational phase is a permanent impact (>60 years). Helicopter inspections will generally cause a 'fight or flight' reaction in livestock, particularly with sensitive animals such as thoroughbred horses and young livestock. The potential impact could be high. Given the rare occurrence of injury from 'fight or flight' events the magnitude of impact with mitigation is low. The OHLs will be an additional safety risk on farms, however the magnitude of impact is generally evaluated to be very low based on the existence of similar OHL infrastructure throughout Ireland. The clearance of trees in commercial forests is a permanent impact (>60 years). Overall magnitude of impacts on individual land parcels tend to be low or very low and the sensitivity of land parcels is medium in the majority of cases (80%). The magnitude and significance of the impact on each land parcel along the proposed development is shown in **Appendix 3.1, Volume 3D Appendices** of the EIS**:**

- There will be imperceptible impacts on 90 land parcels within the MSA – 50% of total number;
- There will be slight adverse impacts on 80 land parcels within the MSA – 44.5% of total number;
- There will be moderate adverse impacts on seven land parcels within the MSA – 4% of total number;
- There will be a major adverse impact on three land parcels within the MSA – 1.5% of total number; and
- There will be no profound impacts.

71 Major adverse impacts arise in land parcel LMC-029 due to the OHL traversing polytunnels in an intensive horticultural enterprise, in land parcel LMC-067 due to the clearance of 20% of a 14ha forest and in land parcel LMC-170 due to the clearance of 31% of a 5.1ha forest. The moderate adverse impacts on three land parcels (Ref. No. 065 & 079, 088 and 132 & 214 & 215) arise where the OHLs oversail the land parcel in a manner that may impact on potential future farm yard development. The moderate adverse impacts on four forestry land parcels (Ref. No. 105, 110, 157 and 171) arise due to clearance of forestry under the OHLs.

3.8 INTERRELATIONSHIPS BETWEEN ENVIRONMENTAL FACTORS

72 Interaction between environmental factors include the following:

- Flora and Fauna - Many farmers participate in Environmental Schemes funded by the Department of Agriculture, Food and the Marine, for example the Agricultural Environmental Options Scheme (AEOS). Environmental Options such as Species Rich Grass, Traditional Hay Meadows and Tree Planting may be affected by the placement of the OHLs and the towers. Therefore there is a potential impact on biodiversity on farms. In addition, if trees are cleared in the vicinity of OHLs there is a potential impact on shelter. Overall, the impact from the proposed development on the biodiversity on farms and the availability of shelter is imperceptible.
- Soils, Geology and Hydrogeology - Soil quality and land drainage will be affected by construction works with a resulting impact on crop growth. Overall, this could have an imperceptible or slight adverse impact on land use.
- Water – During construction there is a potential effect on water quality due to surface run-off. With the appropriate mitigation measures this will not impact on water sources for livestock.

- Air – Quality and Climate - Construction activity may cause dust to be deposited on agricultural land which can affect grazing livestock and quality of crops.

- Air – Noise & Vibration - During construction and operational phase's noise may impact on livestock. Maintenance works and helicopter inspections cause noise that may have an effect on livestock. With appropriate mitigation this impact is imperceptible.

73 After evaluating these interrelationships there are no significant additional impacts.

3.9 CONCLUSIONS

74 The low level of landowner engagement presented some difficulties for the evaluation of the baseline environment, particularly with the identification of grass based enterprises where livestock were not seen. Despite these difficulties a detailed evaluation was carried out on land use along the development in the MSA using roadside surveying and examination of aerial photography. The proposed electricity development within the MSA will have an imperceptible impact on land use arising from the construction of 165 towers on 4.2ha of land, 57ha of soil damage caused by construction activity (one tower will be constructed on ESB property which is non-agricultural) and the clearance of approximately 14.6ha of forestry. The residual impacts are either imperceptible or slight adverse on 95% of the land parcels along the proposed alignment within the MSA. Three (1.5%) moderate adverse impacts and one (0.5%) major adverse impact are due to potential restriction of farm yard development. Four (2%) moderate adverse impacts and two (1%) major adverse impacts occur on forestry land parcels where the trees will have to be cleared within a 74m corridor centred on the OHL.