Contents

14 Material Assets – Agriculture

14.1 Introduction

This chapter of the EIAR consists of an appraisal of the proposed N6 Galway City Ring Road, hereafter referred to as the proposed road development, under the heading of material assets - agriculture.

This chapter initially sets out the methodology followed (**Section 14.2**), describes the receiving environment (**Section 14.3**), and summarises the main characteristics of the proposed road development which are of relevance for material assets – agriculture (**Section 14.4**). The evaluation of impacts of the proposed road development on material assets-agriculture are described (**Section 14.5**). Measures are proposed to mitigate these impacts (**Section 14.6**) and residual impacts are described (**Section 14.7**). The chapter concludes with a summary (**Section 14.8**) and reference section (**Section 14.9**).

This chapter has utilised the information gathered during the previous phases of the proposed road development to inform the material assets-agriculture impact appraisal. **Sections 4.12**, **6.5.7** and **7.6.7** of the **Route Selection Report** considered the material assets agriculture constraints within the scheme study area and compared the potential material assets - agriculture impacts of the proposed route options respectively. These sections of the Route Selection Report contributed to the design of the proposed road development which this chapter appraises.

14.2 Methodology

14.2.1 Introduction

This chapter is prepared having regard to the standard guidelines for environmental assessment published by the EPA in 2002, 2003 and draft guidelines published in 2015 and 2017 and also uses the guidelines for arriving at significance of impact as discussed in the UK Highway Agency Design Manual for Roads and Bridges. The information sources referred to in **Section 14.2.3** below are standard for agricultural impact assessment for new road developments.

14.2.2 Guidelines

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

- EPA (Environmental Protection Agency): Guidelines on the information to be contained in environmental impact assessment reports, (Draft May 2017)
- EPA: Revised Guidelines on the Information to be contained in Environmental Impact Statements, (2002 and Draft, September 2015)
- EPA: Advice Notes For Preparing Environmental Impact Statements, (2003 and Draft, September 2015)

14.2.3 Data Sources and Consultations

The information sources which support this impact appraisal are described in **Table 14.1** below.

Table 14.1: Data sources used for the Agricultural Assessment

Information	Data Source
Agricultural statistics	• Census of Agriculture 2010[1] from the Central Statistics Office (CSO) – used to provide background data on the average size and enterprise mix of farms in County Galway • CSO, Average crop yields from 2008 – 2016 and Teagasc data for grass production at Ballyhaise Agricultural College (2008 – 2016)
Soils	• EPA digital soils data • The 'General Soil Map of Ireland' (1980) • Windshield survey, orthophotography, and on-farm surveys
Land use & farm details	• Land registry mapping data • Farmer interviews • Windshield survey • Orthophotography - used as an aid in examining farm layout and land quality

A consultation letter was sent to the Department of Agriculture, Food and the Marine November 2016.

14.2.3.1 Technical Limitations

The author was able to engage directly with landowners in relation to 145 land parcels[2] (74%) of a total of 195 agricultural land holdings directly affected by the proposed road development. Where landowners could not be contacted directly the following information sources used were:

- Roadside vantage point surveys
- Examination of aerial photography
- Reference to other desk information sources such as Land Registry Mapping, CSO statistics for County Galway and Digital Soil Data

The available data was sufficient for the agricultural impact appraisal along the entire proposed road development.

[1] The Census of Agriculture 2010 is the most up to date survey providing data on farm and enterprise types and size on a per County basis.
[2] Where landowners could not be contacted directly the agricultural consultant wrote to the landowner.

14.2.4 Study Area and Baseline Data Collection

The study area comprises of 195 agricultural land parcels that are directly affected by the proposed road development, a total area of approximately 1,096 hectares. The locations of these land parcels is shown in **Figures 14.1.1** to **14.1.14** and extends from Na Foraí Maola in the west of the study area to Coolagh in the east. Proximity to an expanding city has resulted in many smaller, fragmented holdings and this combined with poor land quality (particularly west of the Corrib) means that the sensitivity of agriculture along the proposed road development is low (48% of land parcels are low or very low sensitivity). Landowner interviews and on-site surveys were conducted by the author in January 2016 – December 2017. Where possible landowners were interviewed and asked to describe their farming enterprise, how the land is being used, how access is provided and to identify sensitive features on their farms such as farm yards, wells/springs and access tracks and gates.

14.2.5 Impact Assessment Methodology

The assessment of agricultural impacts involves:

1. Evaluation of the baseline environment, the types of farms and the sensitivity of the individual farms along the route of the proposed road development
2. Evaluation of the nature and magnitude of the effects on each farm and the effects on farming collectively along the entire route of the proposed road development and within County Galway
3. Having considered the sensitivity of the baseline agricultural environment and the magnitude of effects, the impact significance is predicted for:
    a. each land parcel affected along the route of the proposed road development
    b. agriculture collectively along the proposed road development (i.e. locally within the study area)
    c. agriculture within County Galway (i.e. regionally)

These three elements of the methodology are described in **Sections 14.2.6.1**, **14.2.6.2** and **14.2.6.3**. It is important to note that this agricultural appraisal assesses the changes that will occur to the physical agricultural environment and assumes that, because landowners are compensated for attributable financial losses, their financial status will not change.

14.2.5.1 Evaluation of sensitivity of farms

Each land parcel is evaluated to determine its sensitivity based mainly on the criteria shown in **Table 14.2** below.

Table 14.2: Criteria for categorisation of sensitivity of farms

Farm Enterprise Type	Sensitivity
Stud farm, Equestrian centre	High - Very High
Dairy farm, Intensive equine enterprises	High
Non-dairy grazing livestock enterprises (including beef, sheep and non-intensive equine) and grass cropping enterprise	Medium
Tillage	Medium
Rough Grazing, Bog, Forestry, Woodland (where poor land quality restricts farming practices)	Low - Very low

Each appraisal of sensitivity is subject to professional judgement and evaluation of other site specific factors such as the land quality and importance of the enterprise.

14.2.5.2 Evaluation of impact magnitude

The magnitude of the potential impact is assessed by predicting the change on the affected farm or on agriculture along the route of the proposed road development. For example, if the proposed road development takes 10% of an affected grassland farm, and provided the farm enterprise can continue after the proposed road development is constructed, it is possible to predict that the yield of grass from the farm will be affected by approximately 10%. In order to quantify the magnitude of the impact, typical baseline trends[3] in the agricultural environment are examined and interpreted using the author's professional judgement. Therefore, impacts which result in a 2.5% to 5% variation in yield are considered to create a low magnitude impact on the farm and are similar to natural baseline trends in yield and is considered low magnitude. Between 5% and 10% the magnitude of yield loss is starting to exceed the natural baseline trends and is considered medium. Yield effects which exceed 10% are considered to be high magnitude. Other factors affect the magnitude of impact such as, severance or separation of land, the duration of impact, the quality of land affected and impact on farm yards and other facilities on the farm. **Table 14.3** shows the criteria which are used to indicate the magnitude of impact and each assessment is subjected to professional judgement.

[3] According to CSO data (2008 – 2016) the yield of spring barley and winter wheat will vary by approximately 7.5% from the average mean yield. Similarly, according to Teagasc data for grass production at Ballyhaise Agricultural College (2008 – 2016), the natural trend is for grass production to vary on average by 8% from year to year.

Table 14.3: Indicative criteria for assessment of impact magnitude

Indicative Criteria	Impact Magnitude
• A high proportion of the land permanently taken (e.g. >10%) • A high proportion of farm permanently separated (e.g. > 15 %) • Farm buildings or water sources may be affected permanently	High – Very High
• A medium proportion of the farm permanently taken (e.g. 5% - 10%) • A medium proportion of farm permanently separated (e.g. 7 % - 15%) • Farm buildings or water sources may be affected but can be replaced • Temporary (construction) impacts which have long term effects	Medium
• A small proportion of the farm permanently taken (e.g. 2.5% - 5%) • A small proportion of farm separated or no separation (e.g. 2.5% - 7%) • Farm buildings or water sources generally not affected but if affected can be replaced • Temporary (construction) impacts which have short – medium term effects	Low
• A very small proportion of the farm taken (e.g. <2.5%) • A very small proportion of farm separated or no separation (e.g. <2.5% of the farm) • Temporary (construction) impacts which do not have residual effects	Negligible – Very Low

Impacts that occur during the construction phase will generally have low or very low magnitude because of the short duration (e.g. construction noise and vibration). Medium magnitude impacts may arise during construction where for example there is a long term impact on land drainage as a result of the construction activity.

14.2.5.3 Evaluation of significance of impact

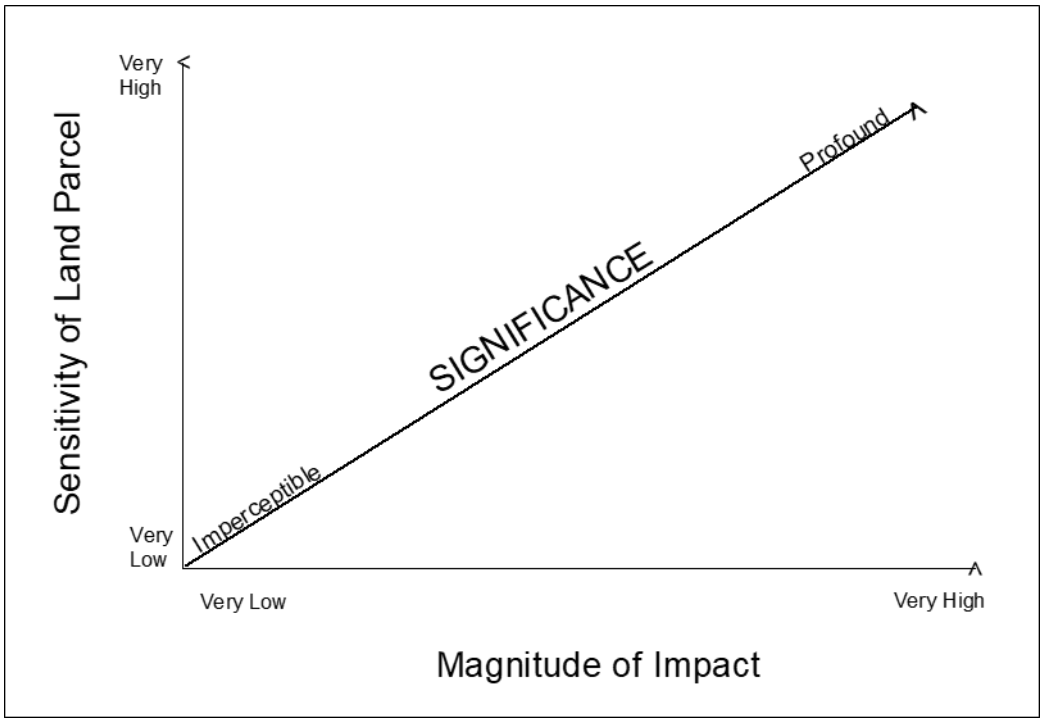
The significance of the impact is determined by evaluating both the magnitude of the impact and the sensitivity of the affected farm. Therefore, an impact which affects a farm with a low sensitivity will not be as significant as a similar magnitude of impact which affects a farm with a high sensitivity.

Section 3.7.3 of the EPA Guidelines on the information to be contained in environmental impact assessment reports (Draft, May 2017) contains guidelines for describing the significance of impacts. These guidelines have been adopted with minor adjustments that are appropriate for agricultural impact assessment. In general the impacts on agriculture are adverse in nature. The comparisons between the EPA guidelines and the criteria used in this appraisal are shown in **Table 14.4**.

Table 14.4: Comparison of significance of impact criteria used in this assessment with the EPA 2015 Guidance

Significance of impacts as per EPA 2017 Guidance	Significance of impacts used in this appraisal
Imperceptible Impact An effect capable of measurement but without significant consequences	**Not Significant Impact** An impact which may result in measurable effects and / or noticeable changes but the consequences are not significant.
Not Significant An effect which causes noticeable changes in the character of the environment without significant consequences	
Slight Impact An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.	**Slight Adverse Impact** An impact which causes noticeable changes in the character and management of a farm in a minor way. The farm enterprise experiences inconvenience as a result of the proposed road development.
Moderate Impact An effect that alters the character of the environment in a manner that is consistent with existing emerging trends.	**Moderate Adverse Impact** An impact which alters the character of a farm in a manner that requires moderate changes in the management and operation of the farm. The farm enterprise can be continued as before but with increased management or operational difficulties.
Significant Impact An effect which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.	**Significant and Very Significant Adverse Impact** An impact which by its character, magnitude, duration or intensity alters a sensitive aspect of the farm. The farm enterprise can be continued, but will require major changes in management and operation of the farm. This would typically occur where the farm was split in two due to separation but where access between the separated portions and the farm buildings could still be achieved effectively. Assuming the enterprise can continue the degree of change in the management and operation of the farm will determine whether the impact is Significant or Very Significant.
Very Significant Impact An effect which by its character, magnitude, duration or intensity alters the majority of a sensitive aspect of the environment.	
Profound Impact An effect which obliterates sensitive characteristics.	**Profound Adverse Impact** An impact which obliterates sensitive characteristics of the farm. The farm enterprise cannot be continued as a result of the proposed road development. This would occur where landtake was of such a scale that the remaining land would not form a viable unit or where separation was of such a nature to make the holding unworkable or where important farm buildings and facilities were removed and could not be replaced. In some situations, the farm enterprise may continue but will require dramatic changes in the future management and operation of the farm, such that the scale and operation of the enterprise is changed dramatically.

Plate 14.1: Significance of Impact on Land Parcel Impacts



Significance of impact is determined by evaluating the magnitude of impacts and sensitivity of the farm. This assessment is subject to variation due to professional judgement on a case by case basis.

14.3 Receiving Environment

14.3.1 Agricultural Enterprise Types

195 land parcels are directly affected by the proposed road development. The locations of these land parcels are shown on **Figures 14.1.1** to **14.1.14**. **Table 14.5** below compares land use along the route of the proposed road development to the statistics for County Galway. The Census of Agricultural (2010) Statistics categorises land use into eight agricultural groups: specialist tillage, specialist dairy, specialist beef, specialist sheep, mixed grazing livestock, mixed crops and livestock, mixed field crops (mainly hay & silage) and other. For this appraisal the number of groups is reduced to five for comparison purposes as follows:

- Mainly Dairy - entirely a dairy farm or the dairy enterprise is the most significant target of the impact). Generally high sensitivity
- Non-dairy grazing livestock and mixed field crops– includes specialist beef cattle, specialist sheep, and mixed farms with cattle, sheep and horses. Generally medium sensitivity
- Mainly tillage - tillage cropping. Generally medium sensitivity
- Mixed crops and livestock - various crops and livestock. Medium sensitivity
- Other (e.g. pigs, poultry, horticultural cropping and equine as the main enterprises). Medium – very high sensitivity

The Census of Agriculture 2010 statistics show that the average size of farms in County Galway is 25.8 hectares. This compares to a national average size of 32.7 hectares. The average size of land parcels along the route of the proposed road development is approximately 6.0 hectares. The small size of land parcels along the proposed road development is a result of the close proximity to Galway City. Many holdings have been subdivided among family members and land has been sold for development. Approximately 21% of land parcels are less than 1 hectare in size and therefore have limited agricultural use. Beef farming is the main enterprise along the route of the proposed road development. Compared to the national average the number of small equine enterprises along the proposed road development is high; these horses are mainly kept for leisure purposes.

Table 14.5: Land Use Statistics along the Proposed Road Development compared to National and Regional Statistics

Farm/Enterprise Category	Total Nos. of affected land parcels within each category	% of farms within each category		
		Land parcels along proposed road development	Farms in Co. Galway	Farms nationally
Mainly Dairy	6	3	3	11
Beef and/or sheep and hay/silage	123 (4 with sheep)	63	95	82.5
Mainly Tillage	0	0	0.5	3.5
Mixed Crops & Livestock	0	0	1	2
Other (Equine)	34 (31 equine)	17.5	0.5	1
Not Farmed	32	16.5	0	0
Total	195	100	100	**100**

Table 14.5 shows that the main farm enterprise along the route of the proposed road development is beef (and sheep). The sensitivity of these land parcels range from very low to medium. There is one high sensitivity beef enterprise (cattle trader – PRO[4] 701) and two high[5] sensitivity dairy enterprises (PRO 239 & PRO 241). The Galway Racecourse (MO[6] 691) is classified as very high sensitivity due to the equine enterprise and regional importance. There are two very high sensitivity equine land parcels (MO 751 & MO 760) and the remaining equine enterprises are medium, low or very low sensitivity enterprises where horses and donkeys are kept mainly for leisure purposes. See **Appendix 14.1** for details of each individual land parcel.

[4] Protected Road Scheme Reference Number
[5] There are six dairy land parcels. Two dairy farmers rent four adjoining land parcels which are classified as medium sensitivity.
[6] Motorway Scheme Reference Number

14.3.2 Soil Types

Soil types along the route of proposed road development are described in detail in **Chapter 9, Soils and Geology** of this EIAR. In general, the soil quality is poorer west of the River Corrib. From the townland of An Baile Nua to Na hAille the dominant soil type is a peaty soil with rock out crops and interspersed with blanket bog. The drainage is poor and the land is wet. From Na hAille to the River Corrib the dominant soil type is a poorly drained mineral soil. East of the River Corrib the quality of land improves from an agricultural perspective; although the quality is variable. Adjoining the River Corrib there is low lying alluvium soils that are subject to flooding. Further east in Menlough and Ballindooley the topography is undulating and the dominant soil type is a mineral brown earth interspersed with a shallow soil with limestone out crop. From Ballindooley to Doughiska the dominant soil is a shallow free draining mineral soil. The topography is flat or gently undulating. This land is good quality grazing land and some of it is suitable for tillage. In general the soil types along the route of the proposed road development are suited to non-intensive grazing by beef cattle.

14.4 Characteristics of the Proposed Development

A detailed description of the proposed road development and construction activities are provided in **Chapter 5, Description of Proposed Road Development** and **Chapter 7, Construction Activities**. This section outlines the characteristics and activities of the proposed road development of relevance to material assets - agriculture.

The proposed road development will consist of a road carriageway, embankments, cut slopes, accommodation works, drainage features and planted/landscaped areas which will traverse agricultural lands. Approximately 219 hectares of land will be acquired from affected land parcels for the proposed road development.

14.4.1 Construction Phase

It is estimated that the construction period will last for approximately 36 months. At the beginning of the construction phase the land to be acquired will be fenced and access across it is restricted. In certain situations, temporary crossing points for livestock and machinery will be allowed until accommodation roads are constructed. Water and power supplies will be disrupted requiring alternative sources and ducting under the proposed road development. Watercourses will be diverted and the carriageway will be lower and higher than the adjoining farm land at different locations. This will disrupt land drainage requiring the construction of culverts and maintenance of the land drainage along the edge of the earthworks for the proposed road development.

Construction of the proposed road development will require activities such as excavation, tunnel work, pilling, rock breaking/blasting and movement of materials within the fenced off works area (ref. **Chapter 7, Construction Activities**). This will generate noise, dust and movement of machinery which will potentially impact on adjoining lands (ref. **Chapter 16, Air Quality and Climate** and **Chapter 17, Noise and Vibration**). The duration of these works will vary. In the worst case

scenario (for example beside an in-situ crushing plant) this disturbance could last the entire construction period for that location, however, in general it is expected that construction activities such as rock breaking/blasting at any one location will last for a period of few days up to a few weeks.

14.4.2 Operational Phase

When the construction phase is complete and the mitigation measures implemented the residual effects of the proposed road development will be permanent. These effects will result in a change in the structure and layout of farms along the route of the proposed road development reducing the size and separating part of farms. A low level of disturbance will be experienced due to traffic. Landowners will be compensated to ensure they are not at a financial loss.

14.5 Evaluation of Impacts

14.5.1 Introduction

The potential impacts on each land parcel along the route of the proposed road development are evaluated and a summary presented in **Tables 14.6** and **14.7**. An assessment of the potential impacts on agriculture along the entire route (i.e. within the study area) is presented in **Sections 14.5.3** and **14.5.4**. The potential cumulative and regional impacts on agriculture are addressed in **Sections 14.5.5** and **14.5.6**.

14.5.2 Do Nothing Impact

Farmers as members of the local community regularly use the existing road network to access schools and shops and to purchase goods and sell produce. Tractors travel on the existing road network to access farms and herds of cattle. Lorries and goods vehicles deliver and collect goods from farms. In the "Do Nothing" scenario the existing traffic congestion will continue to have a small adverse impact on agriculture which is considered to be not significant.

14.5.3 Potential Construction Impacts

General construction noise and vibration and the generation of dust will have no significant or slight adverse impacts. Rock breaking/blasting and piling activities may result in a flight response in livestock but rarely causes a significant impact, particularly with mitigation, and will have no significant or slight adverse impacts. The landtake will result in the acquisition of farm buildings (mostly small sheds and outhouses) on 17 land parcels[7], which will result in temporary impacts because these facilities can be replaced with new buildings on the retained lands. There will be temporary disruption to power and water supplies but with mitigation the impact is not significant or slight adverse. Land drainage will be affected during the construction period where drainage outfalls from agricultural land is intercepted or blocked by the proposed road development. The proposed drainage design insures

[7] Ref Nos PRO/MO 117, 154, 229, 243, 259, 289, 495, 498, 572, 583, 625, 626, 632, 691, 689, 701 & 754

that all drainage outfalls are maintained or redirected to a suitable outfall and with mitigation the impacts are generally not significant.

Once the proposed development boundary fencing is erected the land inside it is no longer available to the landowner. The reduction in land area is a permanent impact and the range of impact due to loss of land ranges from not significant to profound. The proposed road development will cross 62 land parcels causing separation of part of the farm, separating approximately 163 hectares of land and creating 87 new land parcels. During construction temporary crossing points for livestock and machinery will be allowed until accommodation roads are constructed. Land separation is a permanent impact and the range of impact is not significant to significant adverse.

14.5.4 Potential Operational Impacts

The mitigation measures set out in **Section 14.6** will be constructed and implemented during the construction phase. Maintenance of the proposed road development will continue during the operational phase and in a very small number of cases remedial works may have to be carried out during the operational phase (e.g. maintenance of the fenceline along the mainline of the proposed road development). The land loss impact which commences with the fencing off of the acquired land during the construction period is a permanent residual impact that continues in the operational phase. The reduction in size will result in a reduction in farm output and the range of impact is not significant to profound. This impact cannot be mitigated except through compensation. In the longer term landowners may be able to replace the area of acquired land, but generally the replacement land will be separated from the original holding. Similarly, the separation of parts of farms (often referred to a severance) is a permanent impact that can be mitigated by providing access roads to the separated land parcel. This will result in additional travel distances and additional fixed costs on a farm and the range of impact is not significant to significant adverse. Impacts on drainage are generally not significant or slight adverse. The permanent disturbance impact caused by traffic, noise, air emissions and lighting is not significant.

14.5.5 Summary of Potential Impacts

The potential (pre-mitigation) impacts on land parcels along the route of the proposed road development are summarised in **Table 14.6**.

Table 14.6: Summary of Potential (Pre-Mitigation) Impacts

	Numbers of Land parcels				
Significance of Impact	**Mainly Dairy**	**Beef / sheep and hay / silage**	**Other (incl. Equine)**	**Not farmed**	**Totals**
Not significant	2	33	8	16	**59**
Slight	1	22	6	8	**37**
Moderate	-	19	6	6	**31**
Significant	-	35	11	2	**48**

	Numbers of Land parcels				
Significance of Impact	**Mainly Dairy**	**Beef / sheep and hay / silage**	**Other (incl. Equine)**	**Not farmed**	**Totals**
Very Significant	1	6	0	-	**7**
Profound	2	8	3	-	**13**
Total Nos. of Farms	**6**	**123**	**34**	**32**	**195**
	68 land parcels are predicted to have impacts which are significant adverse and greater (35% of all affected land parcels)				

The agricultural study area consists of 195 land parcels and 1,096 hectares of land of which approximately 219 hectares is within the proposed development boundary. Before mitigation, the potential impact on the study area is moderate adverse where in addition to 219 hectares of agricultural land which is acquired an additional, 172 hectares of land is separated without effective access (16% of the total agricultural area).

14.6 Mitigation Measures

14.6.1 Introduction

Mitigation of potential impacts takes place under two headings:

- General mitigation measures – described in **Sections 14.6.2 Construction Phase** and **14.6.3 Operational Phase** below
- Compensation under the Compulsory Purchase System – compensation to farmers for residual damage is part of the statutory process for compensation

14.6.2 Construction Phase

1. The landowner will be provided with access to all separated land parcels during the construction of the proposed road development. Where temporary disruptions to this access occur landowners will be notified in advance.
2. Where existing water and electricity supplies are disrupted during the construction phase an alternative water source or electricity supply will be made available e.g. water tanker or electric cable ducting. If access to surface drinking water sources are permanently restricted alternative groundwater supplies will be provided (or compensation to allow farmer drill his own well).
3. Suitable boundary fencing will be erected to delineate the line of the proposed development boundary and prevent disturbance to adjacent land.
4. A key contact person will be appointed during the construction phase to facilitate communications between affected landowners and to facilitate the re-organisation of farm enterprises by farmers during critical times.
5. Landowners with lands adjoining sites where either rock breaking, blasting or piling takes place will be notified in advance of these activities.

6. The impacts on water quality will be minimised by way of a programme of mitigation measures for surface and ground water sources as described in **Chapters 10, Hydrogeology** and **Chapter 11, Hydrology**.
7. The spread of dust onto adjoining lands will be minimised by way of mitigation measures set out in **Chapter 16, Air Quality and Climate**. Typically, the impact of dust on agricultural grazing livestock is not significant.
8. Where drainage outfalls are temporarily altered or land drains blocked or damaged an adequate drainage outfall will be maintained and land drains will be repaired.

14.6.3 Operational Phase

1. The loss of agricultural land due to the construction of the proposed road development is a permanent loss which cannot be mitigated except through financial compensation.
2. Landowners who lose buildings to the proposed road development will be compensated. Compensation payments will enable farmers to replace buildings.
3. All separated land parcels will be accessible either via the local road network, via accommodation access roads and access tracks.
4. Where existing water and electricity supplies to fields or farm yards are severed, the supply will be reinstated by provision of ducting where possible. Alternatively, where ducting is not feasible a permanent alternative water source or electricity supply will be made available. Compensation payments will enable farmers to replace power and water supplies.
5. Landowners may have to build additional farm facilities (e.g. cattle holding and testing pens) on their separated land. Field boundaries and paddock systems may have to be re-organised to take into account the altered shape of fields. These matters are addressed in the compensation settlements.
6. Water from the proposed road development will be diverted to attenuation ponds before discharging to watercourses or to ground. The drainage design of the proposed road development will intersect existing field drains and carry the drainage water to suitable outfalls.
7. Other injury impacts such as loss of shelter, removal of field boundaries, disruption of farm roads and field paddock systems and the increased potential for trespass on to private land due to the proposed road development are taken into account in this assessment. Statutory compensation will be used to compensate landowners for residual effects and to allow the landowners to execute mitigation measures and re-instatement works on their own land.
8. Landscaping along the proposed road development will minimise the visual impact on farms along the route of the proposed road development and will over time improve shelter in affected farms.

14.7 Residual Impacts

14.7.1 Introduction

Residual impacts are evaluated for each of the farms affected by the proposed road development. The impact on agriculture along the route of the proposed road development and within County Galway is evaluated and cumulative impacts are considered.

14.7.2 Construction Phase

The impacts resulting from the generation of noise, dust and construction traffic are temporary in nature and with mitigation are not significant. Prior to the construction of access roads or access tracks land will be separated by the proposed road development. In such situations points of temporary access will be provided to landowners to allow them to access their separated land parcels during the construction phase. Disturbance due to construction activity will be temporary and the impact is expected to be not significant or slight adverse. Land drainage impacts that are mitigated during the construction phase are not significant.

14.7.3 Operational Phase

The operational phase is considered to be in excess of 30 years and therefore residual effects that occur for this duration are permanent and therefore more significant than the temporary impacts that occur during the 36-month construction phase. Impacts such as loss of land and separation (severance) of land occur during the construction phase but are permanent residual impacts in the operational phase also. The design of the proposed road development will ensure that the land drainage of affected farms is not significantly affected and the significance of impact is not significant or slight adverse. The residual impacts on farms along the route of the proposed road development is summarised in **Table 14.7**.

Table 14.7: Summary of Residual Impacts

	Numbers of Land parcels				
Significance of Impact	**Mainly Dairy**	**Beef / sheep and hay / silage**	**Other (incl. Equine)**	**Not farmed**	**Totals**
Not significant	2	33	9	15	**59**
Slight	1	28	6	9	**44**
Moderate		25	8	8	**41**
Significant	1	28	10		**38**
Very Significant		8	0		**9**
Profound	2	1	1		**4**
Total Nos. of Land parcels	**6**	**123**	**34**	**32**	**195**
51 land parcels are predicted to have an impact which is significant adverse or greater (26% of all affected land parcels)					

The agricultural study area along the proposed road development consists of the area of all land parcels directly affected i.e. approximately 1,096 hectares. Approximately 219 hectares of land will be acquired which is approximately 20% of the study area. Land separation will affect 62 land parcels and 172 hectares of land will be separated – approximately 16% of the affected area. However, after mitigation effective access will be provided to the separated lands. The overall residual impact on agriculture along the proposed road development (i.e. within the study area) is moderately adverse.

14.7.4 Cumulative Impacts

The cumulative impact on regional agriculture is appraised by assessing the impact on agriculture in County Galway due to the landtake for the proposed road development in combination with other recently constructed and planned roads (M6, N17 / N18, N59 Maam Cross to Oughterard and Moycullen Bypass). The planned M6 (M17/M18) Motorway Service Area and the GTS measures (Eastern Galway City Park & Ride, Bearna Greenway, Galway to Oughterard Greenway and Galway City to Oranmore Cycleway) are also considered. These recently constructed and planned projects in combination with the proposed road development will require <1% of the agricultural area of County Galway (346,881 ha). When considered along with upward agricultural productivity trends[8] the cumulative impact on agriculture in County Galway is not significant.

There are cumulative impacts from the recently constructed M6 Scheme on four individual land parcels at the eastern end of the proposed road development. While there are significant cumulative impacts individually on these four[9] land parcels

[8] From 2010 – 2016 cattle numbers and sheep numbers increased 7% and 25% respectively – source CSO Table AAA08 and DAFM website.
[9] MO 751, MO 752, MO 754, and MO 758.

within the study area, the overall cumulative impacts on agriculture is not significant.

14.8 Summary

The proposed road development will traverse an area mainly consisting of small agricultural holdings. The land quality west of the River Corrib is generally poor and although mixed, the quality of land is better east of the River Corrib. The main farming enterprise is beef cattle. There is a relatively high proportion of very low – medium sensitivity equine enterprises along the route of the proposed road development.

The proposed road development will acquire approximately 219 hectares of land from 195 land parcels and will create separated land on 62 land parcels, resulting in the following residual impacts:

- 103 not significant and slight adverse (53% of land parcels along the route of the proposed road development)
- 41 moderate adverse (21% of land parcels along the route of the proposed road development)
- 38 significant adverse (19% of land parcels along the route of the proposed road development)
- 9 very significant adverse (5% of land parcels along the route of the proposed road development)
- 4 profound impacts (2.0% of land parcels along the route of the proposed road development)

The impact on agriculture within the study area is moderate adverse when cumulative effects from land loss due to other road developments are considered. The impact at a regional level (i.e. County Galway) is not significant.

14.9 References

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