Environmental Statement

Planning application for two poultry units and associated works at Domgay Hall, Four Crosses, Llanymynech, Powys, SY22 6SN

Prepared for Mr M Evans

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Mr M Evans

Construction of two new poultry buildings and all associated works

Environmental Statement

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Planning Authority

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CHAPTER 1 - INTRODUCTION

Foreword

This Environmental Statement (ES) has been prepared for Mr M Evans by Roger Parry & Partners LLP. It accompanies a planning application for the construction of two new poultry buildings and associated works at Domgay Hall, Four Crosses, Llanymynech, Powys, SY22 6SN.

The proposal amounts to erecting two poultry buildings to the South of the existing poultry buildings at Domgay Hall. A site layout plan is attached to this Environmental Statement at Appendix 1.

The proposal is a sustainable economic development as supported by national, regional and local planning policy. Ona global scale, the development amounts to an expansion of the UK poultry meat production capacity and a step closer to meeting the rising demand for poultry meat in the UK and becoming self-sufficient in poultry meat therefore reducing the need to import foreign produced poultry meat and this reducing greenhouse gas emissions from fossil fuel consumption in transportation of meat across the globe – so called "food miles".

The proposals assessed for the Environmental Impact Assessment (EIA) are for two poultry buildings at Domgay Hall. The two new buildings will increase stock numbers by 40,000 birds. This will also allow a reduced stocking rate across the Domgay broiler unit.

The proposal is to allow the stocking rate within the poultry buildings to be reduced, allowing less birds per building. Major supermarkets have made commitments to reduce the stocking density of their birds to 30kg/m^2. The reduced stocking density is raising welfare standards above the Red Tractor standards, by providing the birds with significantly more space within the buildings.

The ES is the principal written output of the EIA process, and provides the required information on the predicted environmental impacts of the proposal. It has been prepared in accordance with the Town and Country Planning (Environmental Impact Assessment) Regulations 2017. The ES is intended to enable the recipients (such as the Local Planning Authority) to understand the nature of the development and to evaluate the likely environmental impacts in the light of proposed mitigation measures. The ES therefore represents an essential component of the decision making process and presents information in a readily accessible form.

A Non-Technical Summary (NTS) and Technical Appendices accompany the ES and form part of the same document. Other documents making up the planning submissions include:

- Local Planning Authority Application Forms;
- Design and Access Statement
- Ownership Certificates and Notices;

Copies of the full documentation for this planning application have been placed on deposit at the following location, where they may be examined by members of the public during normal office hours: Roger Parry & Partners LLP, The Estates Office, 20 Salop Road, Oswestry, SY11 2NU

The Environmental Statement, in the form of a CD, can be purchased at a cost of £10 from the above address. The Non-Technical Summary is available free of charge from the same address and can be found on Roger Parry & Partners website at: www.rogerparry.net/planning.

1. Introduction

This chapter summarises the nature of the development and its location, introduces the basis for the planning application, explains the general basis and methods used for the Environmental Impact Assessment (EIA), sets out the structures of the Environmental Statement (ES) and introduces the authors of the ES.

1.1 Introduction to the Environmental Statement

As part of the process of making an application for the construction of two new poultry buildings and all associated works, Mr M Evans has employed Roger Parry & Partners to co-ordinate with the compilation of the associated planning application, including provision of an Environmental Impact Assessment (EIA) to be reported in an Environmental Statement (ES).

This chapter summarises the nature of the development and sets out the purpose of the ES.

1.2 Summary of the Proposals

The proposal is to build two sheds at domgay Hall. The new poultry buildings will have associated feed bins and service yard area.

A scheme of landscaping and biodiversity enhancement is incorporated into the design to support the existing landscaping measures on site to reduce the impact of the development on the landscape and visual receptors, and to provide benefits to local ecological networks and habitats.

1.3 Site Location

The site is located to the north east of the village of Four Crosses in the County of Powys; the local authority is Powys County Council. It lies within an existing arable unit adjacent to the farm buildings and existing poultry units.

The surrounding land is exclusively agricultural.

Settlements surrounding the site include Four Crosses, Llandysilio and Llanymynech.

The site is classed as open countryside in the Powys County Council Local Plan.

There is a footpath which runs through the site. An application will be put in to divert this footpath.

1.4 The Applicant

1.4.1 Business Evolution

The farm business trading as E M Evans has been established within the last forty years and is made up of Mr M Evans.

Domgay Hall extends to 234.17 hectares (578.63 acres). The farm operates an arable enterprise and poultry unit.

The farm business has made the decision to extend their poultry enterprise to provide higher welfare standards for the birds. The applicant wishes to enhance the business to create a sustainable future for themselves and their young family.

1.4.2 Management

The business employs 4 full time people.

1.5 Requirement for an EIA: Legislative Background

The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 require that for certain types of development an EIA must be undertaken. The Regulations prescribe the types of development for which EIA is mandatory (Schedule 1 Development) and others which may require an assessment if they have the potential to give rise to significant environmental impacts (Schedule 2 Development).

1.6 Objectives and Purpose of EIA

The objectives of EIA are as follows:

- To identify the potential environmental impacts of a proposed development, taking into account the characteristics of the development and the local environment, and the views of local authorities and statutory consultees with responsibilities for the environment;
- To interpret the nature of potential impacts;
- To identify measures to mitigate adverse impacts; and
- To report the results of the assessment in an ES for submission to the planning authority.

The purpose of an ES is to present the findings of the assessment into the likely significant environmental impacts of the proposed development. This document describes the assessment process, the results of the assessment of the impacts of the development, assesses the significance of the impacts and describes mitigation measures proposed to reduce impacts to acceptable levels.

The ES is intended to enable stakeholders to understand the nature of the development and to evaluate the likely significant environmental impacts. In the case of the local planning authority it will be used in the decision making process as the relevant planning policy supports large scale agricultural development only where there are no unacceptable environmental impacts. The ES therefore serves to aid the decision-making process and to present relevant information in a readily accessible form.

1.7 Method Statement and Assessment Criteria

The Town and Country Planning (Environmental Impact Assessment) Regulations 2017, require (as set out in Part II of Schedule 4) that an ES should include, as a minimum, the following information:

- *"A description of the development comprising information on the site, design and size of the development;*
- *A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects;*
- *The data required to identify and assess the main effects which the development is likely to have on the environment;*
- *An outline of the main alternatives studied by the applicant or appellant and an indication of the main reasons for its choice, taking into account the environmental effects;*
- *A non-technical summary of the information provided under paragraphs 1 to 4".*

Part I of Schedule 4 expands in detail on the contents of an ES that would comply fully with the spirit of the Regulations. This is provided in Appendix 2.

Good practice advises that EIA should be treated as an iterative process rather than as a one-off, post-design environmental appraisal, and that interested parties be consulted at an early stage to identify key impacts and design appropriate mitigation. In this way, the findings from the EIA have been fed into the design process, leading to a project which achieves a 'best fit' within the environment. This approach has been used throughout the EIA of the livestock installation. Where likely significant adverse impacts have been predicted, or sensitive environments were identified, the results of the EIA have been used to influence the construction, location and design of the poultry installation. In this

way it has been possible to reduce or eliminate likely significant impacts through sensitive design and construction methods alone.

In order to evaluate environmental impacts, it is important that assessment criteria are identified. Any impact is assessed by a combination of the degree of alteration from the baseline state (both positive and negative) which can be predicted (i.e. the magnitude of the effect) and the sensitivity of the receptor(s) (e.g. the rarity of a species/habitat, the quality of a view, the type of land use, the presence of people etc.).

Within this ES, thresholds of magnitude and sensitivity are used to make explicit the conclusion of the assessment process in terms of the significance of the impact. Significance is generally based on the structured evaluation of a number of primary criteria:

- the value of the resource (international, national, regional and local level importance);
- the magnitude of the impact;
- the duration of the impact (whether long-term or short-term, temporary or permanent);
- the reversibility of the impact;
- the number and sensitivity of receptors;
- the nature of the impact; and
- Whether the impact is direct or indirect.

For the purposes of undertaking an EIA, the significance of any impact (positive or negative) is generally considered in terms of:

- *No Significance / Negligible* - beneath the levels of perception, within normal bounds of variation or within the margin of forecasting error: a non-detectable change to a location, environment or species;
- *Minor Significance*: a detectable but non-material and non-noteworthy change to a location, environment or species at a local level, relevant quality standards not approached;
- *Moderate Significance*: a material and noteworthy but non-fundamental change to a location, environment or species of local or district importance, relevant quality standards may be approached;
- *Major Significance*: a fundamental change to a location, environment or species of district to regional importance, relevant quality standards exceeded;
- *Extreme Significance*: a fundamental change (e.g. loss) to a location, environment or species of national / international importance, relevant quality standards exceeded by a substantial margin on a regular basis.

This ES generally follows this theoretical approach. Full magnitude and significance criteria are provided in the individual topic assessment chapters as appropriate.

The assessment process considers residual impacts following the introduction of measures to reduce, remedy or avoid any significant adverse environmental impacts. Mitigation can be applied through the consideration of alternatives, physical design, provision of specific control equipment, project management or operation and other means. Mitigation generally incorporated into the design as

standard and additional mitigation identified by the assessment process is set out within each technical impact assessment chapter of this ES.

1.8 Structure of the Environmental Statement

The key issues together with a clear description of the project and relevant planning policy form the main content of this ES.

This document is supplemented by a non-technical summary (NTS) of the findings of the EIA. The objective of the NTS is to provide an accurate and balanced statement of the key information presented in the ES.

The main body of the ES is set out as follows:

Introduction (Chapter 1) – setting out the background to, and location of, the development and the EIA process;

Scoping and Key Issues (Chapter 2) – summarising how the topics to be assessed and methods to be used were chosen via the initial application process;

Alternatives (Chapter 3) – describing the alternatives considered including the 'Do-Nothing Scenario' and alternative locations, in terms of their physical, operational, economic and environmental feasibility.

Development Description (Chapter 4) – describing the construction, use and physical nature of the proposed plant and its use, including delivery and access issues; and

Policy and Legislative Context (Chapter 5) – summarising the planning and legislative context of the proposals.

The Environmental Assessment Chapters – covering impacts associated with:

- Air Quality (Chapter 6);
- Landscape and Visual Impacts (Chapter 7);
- Traffic (Chapter 8)
- Amenity Issues (Chapter 9);
- Ecology (Chapter 10);
- Noise and Vibration (Chapter 11);
- Water Resources (Chapter 12);
- Soils (Chapter 13);
- Heritage (Chapter 14).

Each chapter sets out the types of impacts possible, summarises relevant legislation and policy (where appropriate), describes the existing background/baseline environment, the methodologies used to predict impacts and associated guidance (along with any limitations of the methodology or available data), magnitude and significance criteria, incorporated mitigation and the provision of additional mitigation, and the residual impact assessment. Where appropriate the assessment of individual sub-topics / sensitive receptors are assessed in discrete sections within each technical chapter. Also, combined impacts (e.g. one effect resulting in another effect, such as atmospheric emissions affecting

habitats, is assessed in one chapter whilst cross referencing other relevant chapters as appropriate); and

Finally, **Summary and Conclusions** (Chapter 15) – provides an overview of the assessment.

Note that drawings are included within the chapters and technical appendices are provided as separate individual appendices.

A Design and Access Statement and other forms and certificates have been submitted separately.

1.9 Authors of the Environmental Statement

A number of organisations and specialist consultants have assisted with the preparation of this ES and provided input into the content of a number of individual technical chapters to a standard format (where possible) provided by Roger Parry & Partners LLP (who also collated the ES). The specific contributions with respect to the key chapters are listed in Table 1 below.

Table 1 - Contribution to the ES

Topic Area	Author
Introduction	Roger Parry & Partners
Scoping and Key Issues	Roger Parry & Partners
Alternatives	Roger Parry & Partners
Development Description	Roger Parry & Partners
Planning Policy Context	Roger Parry & Partners
Air Quality	Roger Parry & Partners/A S Modelling & Data
Landscape	Roger Parry & Partners
Traffic	Roger Parry & Partners
Amenity	Roger Parry & Partners
Ecology	Roger Parry & Partners
Noise & Vibration	Roger Parry & Partners
Water Resources	Roger Parry & Partners
Soils	Roger Parry & Partners
Heritage	Roger Parry & Partners
Summary & Conclusions	Roger Parry & Partners

Richard Corbett is a Professional and Partner with Roger Parry and Partners LLP. He holds a BSc Honours degree in Rural Enterprise and Land Management awarded by Harper Adams University College. He is a Member of the Royal Institution of Chartered Surveyors, following the Rural Faculty of the Royal Institution. He is also a Fellow of the Central Association of Agricultural Valuers. He has seventeen years' experience in rural planning and a total of nineteen years' experience in rural practice. He deals with a diverse range of planning applications from large scale agricultural buildings with EIA development, specialist poultry unit buildings requiring an Environmental Impact Assessment and not requiring an Environmental Impact Assessment, to new dwellings and renewable energy projects.

Rosina Riddle is a Professional and Associate with Roger Parry and Partners LLP. She holds a BSc Honours degree in Rural Enterprise and Land Management awarded by Harper Adams University. She is a member of the Royal Institution of Chartered Surveyors, following the Rural Faculty of the Royal Institution. She has 6 years' experience in rural planning and a total of 8 years' experience in rural practice, with over 4 years post qualification. She deals with a diverse range of planning applications from agricultural buildings, specialist poultry unit buildings both requiring an Environmental Impact Assessment and not requiring an Environmental Impact Assessment, renewable energy projects and Rural Workers Dwellings.

CHAPTER 2 – SCOPING AND KEY ISSUES

2. Scoping and Key Issues

This chapter sets out the requirement for and process of scoping the Environmental Statement (ES), summarises the receiving environment in the vicinity, covers the scoping consultation process and indicates the results of the consultations, and provides the final scope for the ES. Finally it sets out other permitted/proposed developments with which the poultry installation could potentially create cumulative impact.

2.1 The Scoping Process

Schedule 4 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (see Appendix 2) specifies the general information that should be included within an Environmental Statement (ES) as best practice. An ES should identify, describe and assess the likely significant impacts of the development on the environment with reference to:

- *"Population;*
- *Climate;*
- *Flora;*
- *Fauna;*
- *Landscape;*
- *Soil;*
- *Air;*
- *Water;*
- *Material assets (including architectural and archaeological heritage); and*
- *Any inter-relationships between the above"*

The EIA Regulations also require that an EIA should cover:

"Direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development, resulting from:

a) the existence of the development;

b) the use of natural resources;

c) the emission of pollutants, the creation of nuisances and the elimination of waste."

Scoping (i.e. determining the amount of information on each of these principal subjects and effect types to be presented in an ES) is regarded as an important first step in the overall EIA process, although it is not necessarily a mandatory requirement of the EIA Regulations. The primary aim of EIA scoping is to facilitate the planning of a focused EIA that concentrates on the resolution of substantive potential importance and, where appropriate, excluding any non–issues from further consideration. It also allows primary concerns to be identified at an early stage and informs developers of aspects of concern that they may not have been aware of. Surveys and assessment methodologies can also be agreed between all interested parties such that it is less likely that additional information is required after submission of the application.

Regulation 10 of the EIA Regulations allows potential applicants to ask the planning authority to state, in writing, the information that should be set out in an ES.

No scoping opinion has been submitted to inform this planning application.

2.2 Summary of the Receiving Environment

2.2.1 General

The site is located to the north east of the village of Four Crosses in the County of Powys; the local authority is Powys County Council. It lies within an existing arable and poultry unit.

The surrounding land is exclusively agricultural.

Settlements surrounding the site include Four Crosses, Llandysilio and Llanymynech. The site is classed as open countryside in the Powys County Council Local Plan.

2.2.2 Air Quality

Local air quality is dominated by traffic sources including the A483 and the B4393. There are no Air Quality Management Areas within the vicinity of the site.

2.2.3 Landscape

The site lies within a rural area with the chosen site not being included within any areas designated for their landscape character and quality.

The site is an intensive arable field, adjacent to Domgay Hall. The site is bound on all sides by hedgerows, and the landscape around the site is gently undulating.

The site sits in a shallow valley at an altitude of approximately 65 metres AOD.

The population in the immediate surroundings is relatively dispersed with numerous small settlements such as Four Crosses, Llandysilio and Llanymynech. Other key receptors in the vicinity of the site include walkers, horse and cycle riders and road users.

2.2.4 Highways

The site is accessed off the A483 between Llanymynech and Four Crosses. The site is accessed off the council maintained highway, from an improved existing access utilising the existing field gate as per the site and location plans leading to buildings.

It is not proposed that there will be an increase in any traffic movements as the development is only for an additional 40,000 birds. Therefore movements will take place at the same time as the existing poultry units on site.

2.2.5 Population / Socio-Economics

The site lies within the open countryside with limited isolated residential properties close by and small villages in the surrounding landscape. The site lies within the unitary authority area of Powys County Council and the Parish of Llandysilio. According to the 2011 Census the population of Llandysilio was 1,122.

2.2.6 Noise

The noise environment in the area is dominated by road traffic sources from the two surrounding highways. The surrounding community comprises of a mixture of scattered agricultural holdings with some residential dwellings within small settlements. Noise levels across the site are considered to be typical of a rural area.

2.2.7 Geology, Soils, Ground Stability and Contamination

Within the area surrounding the site there is one predominant land type detailed below;

- A significant open valley / vale with a patchwork of medium to large field parcels many displaying established field boundaries of managed and overgrown hedgerows with numerous hedgerow trees. Predominantly arable farming with some lowland dairy farming. Settlements of varying sizes are prevalent from farmsteads to significant urban areas such as Welshpool and Newtown. Open skies dominate with wooded valley sides fringing the valley bottom.

2.2.8 Ecology

Due to the intensive nature of the site, it is assumed that no protected species are likely to be either resident on or visitors to the site.

There are a relatively narrow range of habitats on site, having been arable land for many years.

No standing water is evident within 200 metres of the site and therefore no survey for Great Crested Newts or other amphibians was necessary. Other than the land, other noted habitats were the surrounding hedgerows and off site tree plantations.

The adjacent trees may provide a bat roosting habitat. No trees are likely to require felling to accommodate the proposed development and as a result it is likely that any bats will not be significantly affected.

2.2.9 Water Resources

Drainage ditches flow to the North of the area where the poultry buildings are and the flow along these is towards the west. According to the Natural Resources Wales flood map, the site is not within a flood alert area.

2.2.10 Cultural Heritage

The chosen site itself has no apparent cultural heritage or archaeological interest. Within 500 metres of the site there are two listed buildings.

2.3 Summary of the Scoping Exercise

2.3.1 The aspects of the Development Considered to Have the Potential to Give Rise to Significant Environmental Impacts

Following consideration of the existing environment the potential sources of environmental impacts have been preliminary identified in Table 2 below for construction, operation and decommissioning of the development respectively.

Table 2: Summary of key potential impacts

Potential receptors of impact		Activities & potential Impacts Construction Phase	Operation phase	Decommissioning Phase
WATER	Surface water hydrology and channel morphology	**Use of vehicles and machinery** - Increase in surface runoff from soil compaction **Works near watercourses** - Change in flow velocities - Increased flood risk **Earthworks** - Increased sedimentation of watercourses **Buildings and ancillary structures** - Changes to runoff characteristics and infiltration rates	**Use of vehicles and machinery** - Increase in surface runoff from soil compaction	
	Surface water quality	**Earthworks** - Pollution from suspended material **Materials management** - Pollution from spills or leaks of fuel, oil and construction materials	**Water and manure management** - Decrease in water quality from sudden releases (e.g. from tank failure or yard washing) or gradual seepage of contaminated water into nearby watercourses **Materials management** - Pollution from agricultural chemicals, spills or leaks of fuel and oil - Eutrophication of watercourses - Runoff after manure spread on land affecting watercourses	
	Groundwater hydrology	**Earthworks and site drainage** - Reduction in water table - Changes to groundwater distribution and flow	**Use of borehole for water supply** - Lowering water table	**Termination of abstraction** - Rebound of water table

Potential receptors of impact		Activities & potential Impacts Construction Phase	Operation phase	Decommissioning Phase
	Groundwater quality	**Materials management** - Pollution from spills or leaks of fuel, oil and building materials	**Land-spreading of waste** - Contamination from infiltration arising from over-application **Materials management** - Contamination from agricultural chemicals, spills or leaks of fuel and oil	
LAND	Landscape	**Excavation and earthworks** - Creation of a new landform - Change in character of landscape **Creation of housing** - Change in character of landscape	**Presence of poultry housing** - Change in character of landscape **Presence of feed bins** - Change in character of landscape **Presence of manure** - Change in character of landscape	
	Soils	**Use of vehicles and machinery** - Compaction **Earthworks** - Further erosion of exposed soil	**Spreading of animal manure** - Changes in soil nutrient levels and heavy metals **Use of vehicles and machinery** - Soil compaction - Soil erosion	
AIR	Local Air quality	**Use of vehicles and machinery** - Dust generation	**Storage/spreading manure** - Release of gases to the atmosphere - Ammonia emissions **Animal housing** - Ammonia emissions **Use of vehicles and machinery** - Exhaust emissions	
	Regional / global air quality	**Change in vegetation** - Changes in uptake of CO_2	**Storage / spreading of manure** - Release of gases to the atmosphere	

Potential receptors of impact			Activities & potential Impacts Construction Phase	Operation phase	Decommissioning Phase
				- Ammonia emissions **Animal housing** - ammonia emissions **Animal housing** - increase in domestic production leading to reduction in greenhouse gas emissions through transportation of overseas produce	
FLORA AND FAUNA		Aquatic ecology	**Drainage works and use of vehicles** - negative impact on flora and fauna from increased sediment loading of streams **Materials management** - harm to aquatic flora and fauna from oil, fuel or other substances entering watercourses	**Surface runoff** - pollution of watercourses by contaminated runoff - sedimentation of watercourses **Site drainage** - indirect effect on aquatic flora and fauna from ongoing changes to stream hydrology and morphology **Materials management** - direct and indirect effects from agro-chemicals, oil, fuel or other substances entering the aquatic environment	**Post-closure land-use** - changes in habitat type - opportunity for increase in uncultivated areas
		Terrestrial ecology	**Earthworks and excavations** - habitat removal, fragmentation or severance - disturbance to, or loss of species	**Storage / spreading of manure** - deposition of ammonia onto vegetation **Animal housing** - deposition of ammonia onto vegetation **Physical presence of building and ancillary structures** - alteration or loss of terrestrial habitats - creation of new habitats	**Post-closure land-use** - changes in habitat type opportunity for increase in uncultivated areas

Potential receptors of impact		Activities & potential Impacts		
		Construction Phase	Operation phase	Decommissioning Phase
			Manure spreading - disturbance to, or loss of species	
HUMAN ENVIRONMENT	Socio-economic		**Farming operation** - continued flux of people away from or towards the farm	**Closure of farm** - movement of people away from the farm
	Health & Safety	**Negative publicity** - adverse reaction to perceived health issues	**Waste disposal operations** - risk of nuisance or harm from manure storage (e.g. consumption of contaminated groundwater) - risk of harm from land-spreading manure	
	Amenity		**Presence of building, ancillary structures and field boundaries** - possible alteration of rights of way or reduction in access **Vehicle movements** - increase in number and frequency of vehicles - noise and vibration from vehicle movements **Storage / spreading of manure / feed** - increase in flies and vermin	

2.4 Consultations

No consultation with Statutory and Non Statutory Consultees took place to inform the scope of the EIA.

The main points of the Scope of the Environmental Impact Assessment are set out below:

- **Introduction and Project Description** – The ES should include a description of the site and its surroundings and details of its planning history. It should also include descriptions of the extent and duration of the construction works and longer term day to day activities

- **Planning Policy and Legislative Framework** – The ES should contain a section that considers the planning and legislative framework against which the proposals would be considered and assess whether the proposals accord with such policies and legislation.

- **Air Quality and Climate** – The impact of airborne emissions likely to affect designated nature conservation sites should be considered to include odour.

- **Noise and Vibration** – The assessment should cover the issues identified in the scoping exercise and include predicted noise levels from site operations and background noise monitoring at the nearest sensitive receptors including operation, construction plant and traffic noise and set out any proposed mitigation.

- **Highways and Traffic** – A Traffic Assessment is required which should assess the effects on the local road network of the development and include details of daily movements, operational hours and routing. Details of highway improvements should be included.

- **Ecology and Conservation** – The ES should consider direct and indirect impacts on both statutory and non-statutory sites of biodiversity importance, determine the presence of protected species (bats and great crested newts) and include mitigation as necessary.

- **Flood Risk, Surface and Groundwater Protection (Hydrology)** – The ES will need to include a section on the impact of the development on Water Framework Directive (WFD) objectives. The ES will need to assess the current status of water bodies and proposed mitigation measures to ensure no deterioration to the status. Specifically, the ES should also consider eutrophication of watercourses, leachate from manure entering watercourses and general pollution and manure run-off into watercourses cumulatively to offer operations in this area including the current farming operations.

- **Landscape and Visual Assessment** – The ES should consider the site and its surroundings and should assess the proposals in the context of the local landscape character. A Zone of Visual Influence (ZVI) exercise should show the views affected by the development. Plans of current site conditions and impacts on the quality of views as well as mitigation should be provided.

- **Historic Environment / Archaeology** – The ES should focus on indirect impacts on the settings of nearby listed buildings and include any mitigation proposals.

- **Soils**– The ES should include an assessment on the potential impacts on soils and risks associated the application of manure to agricultural land.

- **Amenity, Material Assets, and Socio-Economics** - The ES should cover issues relating to odour flies and other potential nuisance issues caused by poultry developments.

- The ES must be accompanied by a Non-Technical Summary.

2.5 Items not to be assessed

Issues scoped out from the assessment were as follows:

- Public Safety during the Construction, Operational and Decommissioning as the site will be secure
- Utilities / Services during the construction and decommissioning phase
- Landscape features during the construction, operational and decommissioning stage
- Night-time lighting during the construction and decommissioning stages
- Archaeological during the construction, operational and decommissioning phases
- Architectural interest during construction phase
- Blight during decommissioning
- Fugitive emissions during decommissioning
- Water use during decommissioning
- Archaeology during decommissioning

2.6 Cumulative Impacts

Within the last 3 years there has been one planning application within 1km of the site as shown in Table 3 below:

Table 3 – Planning Applications:

TYPE	NUMBER
Industrial	1
Transport	0
Education and Health	0
Agriculture	0
Retail	0
Civil Engineering	0
Recreation	0
Office	0
Utilities	0
Residential	0

In the time searched there have been no other poultry unit planning applications.

CHAPTER 3 – ALTERNATIVES

3. Alternatives

This chapter sets out the requirement to assess alternatives in the Environmental Impact Assessment (EIA) process and describes the principal alternative sites considered during the development of the poultry installation. It also describes how the final location at Domgay Hall for the proposal was ultimately reached.

3.1 Assessment of Alternatives

Where alternative approaches to development have been considered, paragraph 4 of Part II of Schedule 4 to the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 requires the developer to include in an ES an outline of the main alternatives, and the main reasons for the choice. Although the Directive and the Regulations do not expressly require the developer to study alternatives, the nature of certain developments and their location may make the consideration of alternative sites a material consideration. In such cases, the ES must record this consideration of alternative sites. More generally, consideration of alternatives is widely regarded as good practice, resulting in a more robust application for planning permission.

Schedule 4 of the Town and Country Planning (Environmental Assessment) Regulations 2017 requires that the applicant provides *"an outline of the main alternatives studied by the applicant… and an indication of the main reasons for his choice, taking into account the environmental effects".* The wording of this clause suggests that only those "*alternatives studied by the applicant*" should be addressed such that it is not mandatory to consider all possible permutations of a proposal. It is also necessary only to deal with alternatives in "*outline*" such that detailed environmental assessment of all alternatives, or combinations of alternatives, is not required. In addition, factors other than the environment may be taken into account such as: costs; engineering constraints; safety issues; practicability; operational requirements etc.

An appraisal of suitable sites was undertaken in consultation with having regard to the environmental impact of the sites and having regard to highways and views of the development. The subject site was considered the only suitable location as it is a natural extension to the existing poultry installation and as such no alternatives have been considered for the development.

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CHAPTER 4 – DEVELOPMENT DESCRIPTION

4. Development Description

This Chapter provides a description of the proposed poultry installation at Domgay Hall for which permission is being sought in order for the stocking rate to be reduced across the site to provide higher welfare standards. The description covers the site and its surroundings as well as the buildings and structures that constitute the poultry installation. The chapter also describes the production cycle that will occur, providing information on the inputs and outputs from this process. There is also a summary of the construction and decommissioning phases of the development. This description sets the basis against which the Environmental Impact Assessment has been carried out.

4.1 Site Location

4.1.1 Description of Site

The site is at Domgay Hall alongside the existing poultry units. Ordnance Survey Grid Reference SJ2719 8532.

The site is surrounded by agricultural land, outlying land uses include residential to the South West at Four Crosses and even further afield is Welshpool to the South West. Isolated farm units scatter the landscape.

The site adjoins an existing farm buildings and yard area. The buildings do not therefore represent a major intrusion into an undeveloped area of the landscape as it extends an already developed area. Site bunding and choice of suitable cladding colours will reduce the visual impacts of the development.

Access to the site for all HGV traffic will be from the A483 and an improved existing access off the unclassified road into the site.

4.2 The Development

4.2.1 Overview

Mr Evans has developed an intensive poultry installation that will produce poultry meat for human consumption. It is proposed that the development will allow the stocking rate of the birds to be reduced across the site. The two new buildings will allow an additional 40,000 birds to be housed on site.

The site is to be laid out as per the location plan on Appendix 1 and includes the following elements:

- Two poultry sheds
- Six Feed bins
- Hard standing to front of sheds for turning, loading and unloading
- Vehicular access
- Area set aside for landscaping

The following sections include a description of the production cycle followed by a description of the main buildings and ancillary works, operational arrangements and environmental controls.

4.3 Site Layout

4.3.1 Two poultry buildings

The poultry shed design is illustrated on the proposed elevations. The application is for full planning permission for the erection of 2 new poultry houses as illustrated on the proposed layout plans.

The new buildings proposed will each measure 115m x 18.5m. Eaves and ridge height are 2.59m and 5.17m respectively. Each of the houses have the potential to accommodate 35,000 "standard" broilers, however the two new buildings will only increase bird numbers by 40,000 as birds that are in the existing poultry houses will be moved to the new poultry buildings to reduce the stocking density.

The design of the new buildings will be typical of modern poultry sheds.

The buildings will be fitted with roof extraction and rear gable end extraction fans.

The new buildings and feed bins would be finished in a dark receding colour to be agreed with the planning authority.

Roofs

Box profile metal sheeting at 10 degree pitch. Eaves height: 2.59 metres, ridge height 5.17 metres.

Walls

Box profile metal sheeting.

Insulation

The broiler houses will be insulated with fibre glass insulation to the walls and roofs. The walls will be insulated with 100 mm insulant and the roofs with a 200 mm insulant. The U value will be <0.4 W/m^2 ^{o}C and therefore condensation on the inner lining of the buildings will be eliminated and the solar heat gain into the houses will be minimal.

Flooring

The houses are erected with a smooth easily washable concrete floor on a damp proof membrane. The walls will rest on a poured concrete foundation. The specification is as follows:-

- 100 mm concrete floor thickened to 200 mm thick below perimeter walls, 1,000ga DPM minimum 125 mm consolidated blinded hardcore

Ventilation

The ventilation system will consist of a computer-controlled mechanical tunnel ventilation system.

- There will be ten inlets in each gable end.
- There will be six 800mm diameter extraction fans in the roof of each shed down the slope to minimise the skyline impact.

The ventilation system will be the same in both houses, consisting of high-velocity open-topped roof extract fans, inlets along both side walls and gable end fans on the east-facing end walls. The gable end fans will be used only when very high rates of ventilation are required and any dust from these will be collected in a covered catchment area.

Windows

Polycarbonate windows based on 3% of the floor area to RSPCA Welfare Standards will be incorporated and linked into automatic dusk till dawn sensors with a U value of 1.7 at 62% light transmissions. The windows will be 4 / 6 60mm 20mm / 4mm units with a quoted R_w of 29dB.

Shed Colour

The sheds will be coloured to Local Planning Authority specification. Juniper Green is the applicant's preferred choice.

4.3.2 Ancillary Structures & Description

Hard standing / Loading Area

An approximate 30 metres wide by 75 metres long and 0.15 metre thick concrete apron will be constructed to the front of the buildings together with turning head; this area will be used for loading and unloading chickens and chicks, unloading feed and removing manure.

Feed Bins

The two sheds have six feed bins, three on either side of the sheds. The feed bins will have a 29 tonne capacity and will measure 8 metres high and will be 2.8 metres in diameter.

Housing for Chicken Production

- Housing design and management will be in accordance with the Sector Guidance Note (SGN) EPR6.09.
- Both houses will have a damp proof course and will be insulated to reduce condensation and heat loss.
- Both of the houses will have littered floors and will be fan-ventilated. The ventilation system in each house will consist of side wall inlets and open-topped exhaust fans in the roof, with additional fans in one gable end wall. This will allow ventilation to be adjusted from a conventional side inlet and open-topped ridge fan system, to a tunnel system with gable end fan outlets.
- Both houses will have non-leaking nipple-type drinking systems.
- Systems will be planned and operated with the intention of ensuring that the litter is kept loose and friable. The quality will be regularly inspected. Steps as described in the SGN6.09 will be taken to rectify any litter quality problems.
- The temperature inside the houses will be maintained at pre-set levels in order to meet the health and welfare needs of the birds, according to their age.
- The bird area of each house is accessed via a service room and this will help to prevent draughts, as well as facilitating good biosecurity.
- An indirect heating system will be used for maximum fuel efficiency and to help ensure a consistent temperature with no cold spots or extremes of temperature. Fans will be fitted with shutters to prevent draughts and unnecessary heat loss.
- The ventilation management system will be programmed to control the ventilation rates depending on the health and welfare needs of the birds and the outside weather conditions.

4.4 Access

4.4.1 Site access

The site is accessed off the A483 between Llanymynech and Four Crosses. The site is accessed off Domgay Lane from an improved existing access as per the site and location plans leading to the buildings.

Feed HGVs will be coming from a local feed company using the A483 and then as above.

4.4.2 Routeing

Only routes used by HGVs, Tractor and Trailers and management (4 x 4s) are described below. All other traffic accessing the site such as engineers, vets etc will arrive in a small vehicle and will be too infrequent to discuss.

- Route A: HGV movements will be restricted by design and management to connect to the Strategic Road Network.

4.5 Management Cycle and Stocking Rates

4.5.1 Background

The method of broiler production that represents the *worst case* scenario is described in the following sections. The production cycle described is used to produce "Standards" rather than "Roasters", Standards are grown to a lower weight before slaughter over a shorter period. Typically Roasters are grown to a higher weight over 56 days with a 6 day turn around period (therefore 5.89 crops per year) and Standards are grown to 42 days with a 6 day turn around period (therefore 7.6 crops per year).

Broilers will be purchased as day old chicks and will consist of a 50-50 mix of males and females.

There will be a maximum of 35,000 birds per shed.

The unit will be managed with a two wave clearout per crop: at 36 days the cockerels will be removed and at day 42 days the pullets will be removed.

As required under Best Practice for ES's, the worst case scenario is considered therefore lower than average bird weights have been used which increases the number of potential bird places per crop.

4.5.2 Stocking Rates

There is no maximum stocking density for intensive chicken meat production currently set down in UK domestic law, the law covering the welfare of broiler chickens is covered by general animal welfare law and farmers are expected to comply with the relevant DEFRA Code of Practice. It is not however an offence to fail to keep to the DEFRA Code.

In 2010 EU legislation (Directive 2007/43/EC) came into force that sets new limits on stocking densities. The legislation is expected to be transposed into UK law and members of parliament are considering, when bringing forward secondary legislation to transpose the EU Broiler Chicken Directive into EU law, setting the UK maximum stocking density at 30kg per square metre. The Directive sets as a limit a figure of 33kg per square metre but lays down requirements where derogation up to a maximum of 42kgs per square metre could be implemented.

Despite the potential derogations from the standard stocking density applied by the Directive the commercial reality is that the industry as a whole is decreasing stocking rates in response to higher welfare expectations of consumers.

In order to supply the retail trade, all farmers must as a minimum, be members of the independently audited Assured Chicken Production (ACP) Scheme. The scheme requires farmers to comply with strict management requirements such as stocking at a maximum of 38kg/m^2. Many retailers now require the supply of 'Higher Welfare Chicken' (HWC), which includes those endorsed by the RSPCA Freedom Foods Scheme, and these farms are stocked at a lower rate of 30kg/m^2.

The proposed development will allow for a stocking rate of 30kg/m^2 to be applied across the site.

4.5.3 Summary of Production Cycle

The production cycle follows the same basic procedure as follows:

- Chick placement on day one following pre-warming of the houses by propane space heaters and covering of the floor with wood shavings
- Feed arrives for birds during growing cycle. Volume of feed consumed increases during the growing period.
- Removal of Cockerels (50% of crop) on day thirty five and day thirty six.

- Removal of Pullets (50% of crop) on day forty one and day forty two.
- Remove all manure from sheds prior to land spreading. Manure will also be exported off site to a local AD plant (please see the manure management plan).
- All sheds power washed, disinfected and dried out prior to chick placement on days forty seven and forty eight.

The turnaround period between crops will be 7 days on average; the length of time taken to clear the site will depend on many factors such as when the date on which the crop cycle ends, e.g. if the cycle completes before a bank holiday weekend the clearout may take an additional day to avoid disturbance over the holiday. For the purpose of this report a seven day turnaround period has been used, this would result in producing 7.6 crop cycles per year or an 87.5% occupancy rate. This is higher than the industry norm for this type of cycle and therefore represents a *worst case scenario*.

4.6 Equipment and Management

Feed

The feed is supplied by a local feed company. It is composed of high-quality raw materials and will be designed to suit the nutritional needs of a broiler chicken. The feed will be blown from bulk feed HGVs into the bulk feed bins.

A Feed Conversion Rate (FCR) for the flock of 1.7 kg per kg produced (Aviagen, 2007) has been used for the purpose of this report.

Water

Water is supplied via an existing borehole and mains water supply. It is delivered to the birds via nipple drinkers; there will be a minimum of 1 nipple drinker per 10 to 20 birds as per ACP management requirements.

Nipple drinkers are used due to (a) ease of management, (b) good bird performance (c) maximum hygiene and (d) odour control; they keep the moisture content of the manure low as spillages are rare – dry manure is a less odorous and it is necessary to ensure that the risks of odours are minimised.

Electrical Power

Connection to the electricity grid is made via the existing supply that is connected to the farm adjoining the site.

Mortalities

Mortalities are stored in vermin proof stores prior to being removed under the National Fallen Stock Scheme.

Litter

Wood shavings are used to a depth of 2 cm; this allows the floor to breath and release moisture enhancing environmental conditions inside the poultry house. This depth of litter complies with the Red Tractor Assured Poultry Standards.

The spent litter based on wood shavings is cleared out by a bobcat which will load the trailers directly inside the doors. The litter removal is carried out by staff at the poultry installation and in practice there is very little spillage of litter. To ensure poultry disease guidelines are adhered to and for bio security the litter will be taken off site immediately. It will go directly to be spread on the applicants land or directly off farm to a local AD plant (please see the manure management plan). Manure will only be stored on site as a contingency in a covered store should it not be able to be exported straight away. The manure to be spread on the applicants land will be in accordance with the Codes of Good agricultural and Environmental Conditions and Cross Compliance Regulations. Any excess manure will

be exported off site to Thornfield 003 Ltd AD plant as per GN021 Section 4 – contingency for Storing Manure and Slurry.

Dirty Water

After the litter is cleared the building and roofs inside and the walls are then blown down with compressed air. Washing water then passes via a pipe directly to collection tanks. When the cleaning out is in progress the dirty washing water and any contaminated rain water falling on the yard is directed via drains to manholes and in to the tanks. The dirty water tank will be compliant with the SSAFO Regulations (2010) Wales Standards.

The floors are polished concrete and following a brushing down and a clean with compressed air, there is very little solid matter to be carried away with the washing water. With the drains in the lowest corner of the sheds leading directly into the collection tanks, and no water passing out on to the outside yard, there can be no mistake over the position of the isolating valve when washing down is taking place. The outside area is then cleaned up when the litter has been taken away.

A single pump with 2 pressure washing lances is used for cleaning down of the sheds. The outside concrete service area is temporarily piped into the dirty water collection tank while the litter is being removed.

A level indicator in the tanks is easily visible from the yard, which will help to quickly identify that the tanks need emptying.

Odour & Dust Suppression

Decomposing waste products such as manure, dust and bedding causes odours in intensive meat chicken buildings. Ventilation rate and temperature significantly influence the concentration of odorous compounds; inadequate air movement in the houses, leading to high humidity and wet litter causes poor dispersal of odours. The ventilation system is designed to efficiently move moisture from the house and to remove heat. The drinking system is also designed to eliminate spillage. The shed is also insulated to eliminate condensation. Other management controls include dietary manipulation; crude protein levels will be kept at a practical minimum keeping crude protein low. The feed will contain enzymes that enhance the digestion of the cereal components of the feed as a result of the improved digestion, the amount of water drunk by the birds is reduced, and this in turn leads to a lower moisture content of the litter. Consequently the risks of odour are reduced by this drier litter. The baffle area beyond the ventilation fans will enhance dispersion of odorants by directing odorous air upwards into the wind that is building wake effected leading to enhanced mixing conditions. This dilutes the odorous air reducing odour nuisance at sensitive receptors. Studies undertaken in 2000 showed that baffle areas can recue odour concentration at sensitive receptors by between 30 and 90 percent (Bottcher, 2000).

The period during the bird production cycle at which odour and dust concentrations have the potential to cause nuisance is during the clearing of manure and spent floor litter from the sheds. The Odour Management Plan attached at Appendix 14. is to be adopted and implemented prior to the operational phase of the development.

Noise Suppression

In order to ensure that noise disturbance is minimised the Noise Management Plan attached at Appendix 7 is to be adopted and implemented prior to the construction phase of the development.

Labour and Hours of Operation

There will be additional labour required for poultry catchers, shed cleaners and manure removal contractors amounting to the equivalent of approximately a further 2 additional full time workers. Other employment would include feed delivery drivers, poultry collection drivers, poultry processors, construction workers, cleaning teams, manure removal teams, maintenance plumbers, maintenance electricians, ground workers, landscape contractors etc.

The development will require continual on site husbandry provided by new employees and managers of the poultry farm. Hours of operation are therefore continual while the birds are in the sheds; during the night time staff are required to respond to alerts relating to any equipment repair; a system of alarm via operators' mobile phones is in place. Twenty-four-hour support is also provided by equipment suppliers for the climate control system(heating and ventilation).

4.7 Landscaping Planting and Management

4.7.1 General

The proposed landscaping plan for the poultry site is designed to provide biodiversity benefits to the operational site whilst creating an attractive setting, softening the appearance and obscuring the proposed buildings from view. New planting will include suitable native species and shrubs from local stock, where appropriate, to provide screening and habitat areas for wildlife. Native woodland planted around the site boundary will provide nesting and foraging areas for birds.

4.7.2 Landscape Plan

Woodland Planting

It is proposed to create an area of native woodland planting to form a woodland tree belts of local landscape value.

The proposed woodland planting will use a native mix in order to retain local vernacular. It is proposed to plant the wood as a mixture of "timber trees" and "underwood". The Underwood will be felled and allowed to grow again by coppicing or suckering on a seven to ten year rotation. Many of the timber trees will stand for a number of cycles of regrowth before being felled when full-grown. When felling is undertaken it will be carried out on a rotation so that at all times a screen will remain relating to the length of the development.

Woodland is proposed along the boundaries of the site. This area of planting will include, Elder, Field Maple, Silver Birch, Holly, Black Polar and Scots Pine.

Hedgerows

As part of the landscaping scheme the applicant proposes to maintain the existing mature hedgerows and to grow an effective screen of the development through hedgerow management.

Traditionally, hedgerows were used to enclose or exclude animals and to mark ownership boundaries and rights of way. The particular mix of shrub and tree species in a hedgerow, which reflects both the age and local management customs, contributes to local landscape character. Hedgerows are a living part of landscape history and provide a record of use of the countryside over the centuries. The particular planting mix within the new hedgerows will reflect the local vernacular it will include hawthorn and blackthorn as a base species but will include additional species found locally in ancient hedges.

Rough Grassland

Within the site boundaries on land that can no longer be cultivated as part of usual cropping, areas of rough grassland will be created. The provision of a grassy area will greatly increase the wildlife interest of an arable field. The provision of a natural grassy area, containing some grassland flowering plants and scrub will benefit wildlife including invertebrates, birds, reptiles and amphibians (if located) near to a water feature.

4.7.3 Landscape Management

The applicant will establish a site management plan to ensure the maintenance of the landscaping scheme. This is likely to include thinning the tree cover, where necessary, occasional scrub clearance and mowing to maintain the grassland areas.

4.8 Lighting

The main building's gable ends are lit externally with a single low-wattage fitting of low intensity lighting during normal working hours in winter months. All external lighting are downward facing and protected with a cowl to reduce light spill to outside the unit.

During the clear out and thinning periods the site will be lit by low wattage lighting while birds are being removed from the buildings, this operation will be carried out in low light conditions to minimise stress to the birds.

There is no round the clock external lighting of the site and no use of high intensity security lighting.

During hours of darkness the broiler sheds are illuminated internally to 0.4 lux. The buildings are clad with high density metal profile sheeting and therefore no light will escape to the outside. Regular tests will be conducted to check the effectiveness of the light proofing. The windows are shuttered to avoid light escaping to the outside.

4.9 Environmental Controls

4.9.1 Introduction

Environmental Permit Determination

The proposed operation has a licence to operate under the Environmental Permitting (England and Wales) Regulations 2016 as regulated by Natural Resources Wales (Appendix 3). The number of birds applied for in the permit exceeds the maximum potential of the proposed changes to the condition and therefore will act as a buffer if further expansion is applied for under the planning process in the future. In being issued with the operating permit, the site is required to demonstrate that Best Available Techniques will be used to minimise emissions to all media. A detailed assessment of controls on air pollutants and any residual air quality effects are required as part of this process, the assessment considers impacts of ammonia on ecological sites.

The purpose of the Environmental Permitting is to achieve integrated prevention and control of pollution arising from activities listed in Annex 1 of the European Council Directive 96/61/EC, leading to a high level of protection of the environment as a whole. More specifically, it provides a system requiring operators and regulators to take an integrated, overall look at the polluting and consuming potential of the poultry installation. Central to this approach is the general principle that operators should take all appropriate preventative measures against pollution, in particular through the application of best available technique enabling them to improve environmental performance.

Best Available Technique

The term "best available technique" is defined in Article 2(11) of the European Directive as "the most effective and advanced stage in the development of activities and their methods of operation which indicate the practical suitability of particular techniques for providing the basis for emission limit values designed to prevent and, where that is not practicable, generally reduce emissions and the impact on the environment as a whole."

The best available techniques to be applied to the poultry installation at Domgay Hall are those set out in the European Commission's *Reference Document on Best Available Techniques for Intensive Rearing of Poultry and Pigs* known as the BREF document. The following systems within the BREF Document are applicable to the poultry installation at Domgay Hall:

- Good agricultural practice for environmental management
- Best Available Techniques for nutritional management
- Best Available Techniques for efficient use of water
- Best Available Techniques for efficient use of energy
- Best Available Techniques for the reduction of emissions from poultry housing
- Best Available Techniques for housing of broilers
- Best Available Techniques for the reduction of odour
- Best Available Techniques for the reduction of emissions from storage
- Best Available Techniques for the reduction of emissions from application of manure to land
- Best Available Techniques to reduce noise emissions
- Best Available Techniques for the treatment and disposal of residues other than manure and carcases

The following sections provide more detail on incorporated environmental controls designed to avoid adverse effects on the living conditions of the local population.

4.10 Construction Phase

It is anticipated that the construction period would last for approximately 6 months. During that period construction vehicles and machinery would be active on the site including excavators, dump trucks and haulage lorries.

The sequence of works would start with the stripping of soils. Top-soils would be placed in temporary storage bunds for reuse on site. Groundworks would include cut and gill operations as necessary to achieve the required finished levels, including the proposed ground modelling. All required services would need to be connected, including water supply, electricity supply and drainage.

Concrete for floor and foundations would be imported on to site and structure steelwork would be erected. Roofing and wall cladding would be fitted to the framework. Tradesmen required for the construction and fitting out the buildings would be working throughout the construction phase, with the numbers on site varying according to workload.

Landscaping would be completed during the first planting season following occupation of the proposed buildings.

4.11 Decommissioning

4.11.1 Introduction

The poultry development will be operated and maintained to ensure there is no deterioration in the site conditions during the life of its environmental permit. Materials that will have potential to cause contamination or pollution will be managed so as to minimise that potential. Environmental monitoring will be conducted throughout the operating life to review all emissions from the site.

Prior to the end of operations at the site a Site Closure and Restoration Plan will be prepared. It is anticipated that much of the proposed structure will be recyclable depending on market conditions at the time. In particular the concrete (for aggregate) and metal (for scrap) are likely to be readily

recycled. It may also be possible for the buildings to be re-used for another purpose at the time of decommissioning.

4.11.2 Decommissioning Considerations for the Design

The design of the poultry development is in accordance with all relevant legislation and standards, and industry good practice. The poultry development is designed to ensure it could be constructed, operated, maintained and decommissioned safely, in accordance with the Construction (Design and Management) Regulations.

Decommissioning issues to be considered during the design process include:

- Safety of construction materials;
- Robustness and durability of construction materials;
- Consumables and materials used in operation;
- Ease of access and procedure for dismantling;
- Size, weight and location of equipment;
- Appropriate storage of materials;
- Prevention of accumulations of contaminated or hazardous wastes;
- Ease of maintenance and cleaning;
- Electrical systems;
- Conveyance and control of liquids.

4.11.3 Decommissioning Considerations during Operation

Operational procedures will be adopted that will give due consideration to the ease and safety of decommissioning the poultry development. Staff will be trained to ensure these measures are understood and implemented.

4.11.4 Site Closure

When the site operation is due to cease, a Site Closure and Restoration Plan will be prepared in consultation with the EA. All techniques previously described for minimising or mitigating potential for contamination will be adopted, together with specific measures for Site Closure activities. The Plan will include the following information:

- Site survey and ground investigation data, including soils testing and any proposed protection, decontamination and monitoring measures;
- Details of the removal or flushing out of pipelines and tanks;
- Plans of all underground pipes, tanks, services and foundations;
- Details of the treatment and or removal of all potentially harmful materials;
- Outline proposals for decommissioning, including method statements and risk assessment to be developed in detail prior to commencement of decommissioning of the plant.

In due course, a Closure Site Report will be drafted as part of the application to surrender the Environmental Permit.

All as built drawings and associated documents, Health and Safety files prepared under the Construction (Design and Management) Regulations and operating manuals will be collected together. Risk assessments and detailed method statements will be prepared to identify the hazards; required control measures specific procedures to be adopted during the decommissioning of the poultry development.

Consultation will continue as appropriate with the EA, Health and Safety Executive (HSE), Local Authority and Planning Authority to ensure requirements are met. The relevant Notice of Demolition will be required from the Local Authority, and other notifications required under Health and Safety at Work Act 1974 (or equivalent at the time) will be made.

CHAPTER 5 – POLICY & LEGISLATION

5. Planning Policy and other Legislation

This chapter briefly summarises the principal planning policies and legislation relating to the operation of poultry farms at National, Regional and Local levels. It concludes that the poultry farm at Domgay Hall is consistent with these policies and objectives.

5.1 Introduction

The purpose of this Chapter of the Environmental Statement is to provide an overview of how the poultry development at Domgay Hall 'fits' with the European, National, Regional and Local agricultural policy and legislative framework.

The chapter is structured around the hierarchical policy framework of:

- European agricultural legislation and policy;
- National agricultural strategy and planning policy guidance;
- Regional agricultural strategy and regional spatial strategy; and
- Local development plans.

The aims and objectives of these policies and plans broadly centre on the principles and practice of 'sustainable development'. The extent to which policies at the regional and local levels are being achieved is important to the delivery of the Government's sustainable development objectives.

The section concludes with an overview of the development in the context of the key policy messages.

5.2 European

5.2.1 Introduction

Management of poultry sites for meat production in the UK is largely governed, directly or indirectly, by European law. In this context, much legislation and policy is derived from European Directives; the Directives of particular relevance to the proposed development are:

- The Environmental Permitting (England and Wales) Regulations 2016

The following directive came into force in 2010 and governs the management of broiler chicken production. There is no specific domestic legislation governing the management of broiler farms only general animal welfare law.

5.3 Environmental Permitting (England & Wales) Regulations 2016

The site will accommodate a maximum of 140,000 birds, this is over the threshold of 40,000 birds. However the two proposed buildings will house 35,000 birds each. A permit has been granted by Natural Resources Wales (Appendix 3).

The Environmental Permit is effectively a licence to operate and will only be granted if an acceptable level of Pollution Control management systems are adhered to. Under the Environmental Permitting regime the Environment Agency include the following key areas of potential harm when making an assessment for the Permit:

- Management – including general management, accident management, energy efficiency, efficient use of raw materials, waste recovery and security.
- Operations including permitted activities, operating techniques, closure and decommissioning.

- Emissions to water, air and land including to groundwater and diffuse emissions, transfers off site, odour, noise and vibration and monitoring.
- Information – records, reporting and notifications.
- Poultry Production – including the use of poultry feed, housing design and operation, slurry and manure storage and spreading.

All of the above would be assessed within the requirements of Best Available Techniques (BAT).

5.4 National Planning Policy

5.4.1 Planning Policy Wales (Edition 12, February 2024) – Chapter 5 Productive and Enterprising Places

The Welsh Assembly Government states that:

For planning purposes the Welsh Government defines economic development as the development of land and buildings for activities that generate sustainable long term prosperity, jobs and incomes. The planning system should ensure that the growth of output and employment in Wales as a whole is not constrained by a shortage of land for economic uses.

Economic land uses include the traditional employment land uses (offices, research and development, industry and warehousing), as well as uses such as retail, tourism, and public services. Economic land uses also include construction, energy, minerals, waste and telecommunications sectors which are also sensitive to planning policy. The Welsh Government seeks to maximise opportunities to strengthen the foundational economy, particularly the food, retail, tourism and care sectors which play such a prominent role throughout Wales; the planning system should be supportive of this aim. Similarly, growth in innovative, emerging technology and high value added sectors such as advanced engineering, renewable and low carbon energy, digital and bio-technology sectors are also strongly supported. Development plans should consider the role these sectors may play in terms of investment and job creation in their area. This section focuses primarily on traditional employment land uses (B1, B2 and B8) while policies on other economic sectors are found elsewhere in this chapter and other parts of PPW.

Planning authorities should adopt a positive approach to diversification projects in rural areas. Additional small business activities can often be sustainably located on farms and provide additional income streams. Diversification can strengthen the rural economy and bring additional employment and prosperity to communities.

Diversification activities come in many forms and include both agricultural and non-agricultural activities. Activities could include, for example, livestock and crop processing, non traditional livestock and crop farming, tourism projects, farm shops, and making and selling non agricultural products. Diversification can also include renewable energy proposals such as anaerobic digestion facilities or solar and wind installations, which will help to increase the viability of rural enterprises by reducing their operating costs. These schemes should be supported where there is no detrimental impact on the environment and local amenity.

5.4.2 Technical Advice Note (TAN) 23

1.1.2 In the full context of PPW, therefore:

- Economic development is development (new or change of use) where the resulting space will be occupied by economic activities;
- An economic activity, or economic land use, is an activity which directly generates wealth (output), jobs and income;

- Generating jobs includes providing or sustaining existing jobs as well as creating jobs.

1.1.4 PPW advises that economic land uses include the traditional employment uses (Class B in the Use Classes Order) as well as retail, tourism and public services. This list is not exhaustive and amongst other activities, economic land uses also include agriculture, energy generation and other infrastructure. However, non B class uses and activities are subject to many separate policies and considerations set out in PPW and Technical Advice Notes (TANs), which is some cases will take precedence over the more general principles in PPW Chapter 7 and in this TAN.

1.2.5 Local planning authorities should recognise market signals and have regard to the need to guide economic development to the most appropriate locations, rather than prevent or discourage such development.

2.11 It should not be assumed that economic objectives are necessarily in conflict with social and environmental objectives. Often these different dimensions point in the same direction. Planning should positively and imaginatively seek such 'win-win' outcomes, where development contributes to all dimensions of sustainability.

1.1.3 There are two kinds of special contribution that are particularly relevant to rural development. Firstly, an economic development could make communities more sustainable, by improving the alignment of housing and jobs, encouraging people to work close to home. Secondly, the needs of established businesses or clusters may be very specific. When businesses expand or modernise, they may need to do so in situ; it may be highly inefficient or impracticable for them to relocate to a sequentially preferable site. Similarly new businesses aiming to join existing clusters may need to be close to existing businesses if they are to derive the benefits.

5.4.3 Technical Advice Note (TAN 6)

Planning for Sustainable Rural Communities (July 2010) recognises the need to allow for sustainable economic development. The Government's objectives outlined in TAN 6 broadly are:-

The purpose of this TAN is to provide practical guidance on the role of the planning system in supporting the delivery of sustainable rural communities.

The TAN provides guidance on how the planning system can contribute to:

- *Sustainable rural economies;*
- *Sustainable rural housing;*
- *Sustainable rural services; and*
- *Sustainable agriculture.*

Planning authorities should support the diversification of the rural economy as a way to provide local employment opportunities, increase local economic prosperity and minimise the need to travel for employment. The development plan should facilitate diversification of the rural economy by accommodating the needs of both traditional rural industries and new enterprises, whilst minimising impacts on the local community and the environment.

The Welsh Assembly Government's objective is a sustainable and profitable future for farming families and businesses through the production and processing of farm products while safeguarding the environment, animal health and welfare, adapting to climate change and mitigating its impacts, while contributing to the vitality and prosperity of our rural communities. The planning system can play an important part in supporting the future sustainability of agriculture.

5.5 Local Planning Policy

5.5.1 The Plan does include various references to agriculture and the agricultural economy of Powys. The section quoted at SP6 and its RJ in para 3.3.35 links to national policy, whilst para 4.1.5 confirms that no specific policy is included for agricultural development. Agricultural buildings will be just one type of new development and will be assessed against all the relevant plan policies (design and resources, landscape, environment etc) alongside national planning policy guidance.

5.6 Policy Framework Overview

Examination of the current policy and legislative framework demonstrates that there is an acceptance that agricultural diversification has a continuing role in the rural area. The proposals are consistent with policies and objectives.

5.7 Conclusion

As a result of the development adjoining existing modern buildings the extent of the harm the development will have on the surrounding area is limited; the buildings are in line with planning policy having been grouped with existing buildings. The buildings will be designed and constructed of materials to take account of their surroundings. All roadways and other engineering operations have been integrated within the existing topography and landscape features.

CHAPTER 6 – AIR QUALITY, HEALTH & CLIMATE

6. Air Quality, Health and Climate

Introduction

AS Modelling & Data Ltd. has been instructed by Mr. Richard Corbett, of Roger Parry & Partners LLP, on behalf of Mr. M. Evans, to use computer modelling to assess the impact of ammonia emissions from the existing and proposed broiler chicken rearing houses at Domgay Hall, Four Crosses, near to Llanymynech in Powys. SY22 6SN.

Ammonia emission rates from the existing and proposed poultry houses have been assessed and quantified based upon the Environment Agency's standard ammonia emission factors. The ammonia emission rates have then been used as inputs to an atmospheric dispersion and deposition model which calculates ammonia exposure levels and nitrogen and acid deposition rates in the surrounding area.

This report is arranged in the following manner:

- Section 2 provides relevant details of the farm and potentially sensitive receptors in the area.
- Section 3 provides some general information on ammonia; details of the method used to estimate ammonia emissions, relevant guidelines and legislation on exposure limits and where relevant, details of likely background levels of ammonia.
- Section 4 provides some information about ADMS, the dispersion model used for this study and details the modelling procedure.
- Section 5 contains the results of the modelling.
- Section 6 provides a discussion of the results and conclusions.

6.1 Background Details

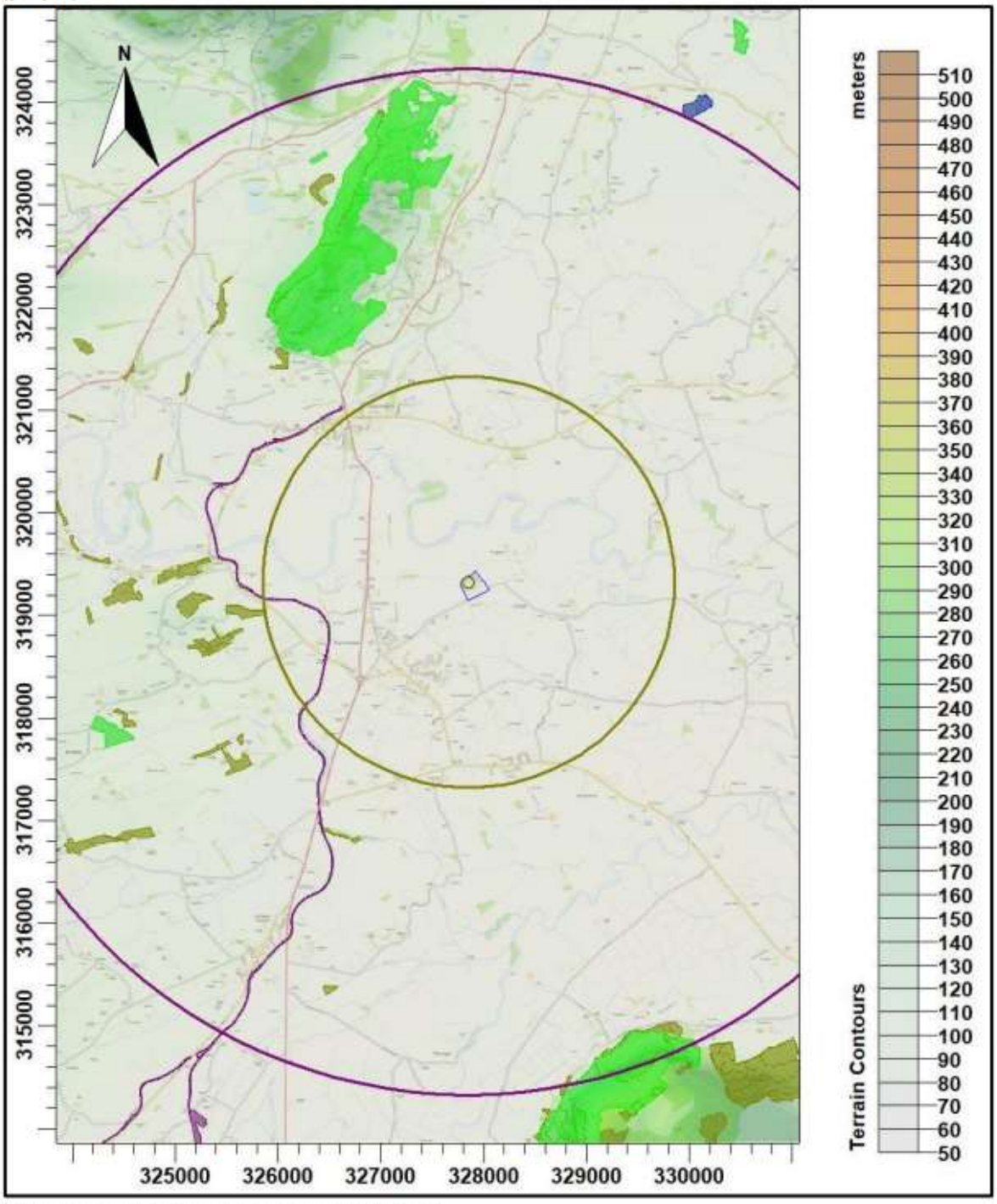
Domgay Hall is in a rural area approximately 750 m to the north-east of the village of Four Crosses, near to Llanymynech in Powys. The surrounding land is used largely for grazing and arable farming and the farm is located on level ground on the banks of the River Vyrnwy at an elevation of around 65 m, with the land rising to the north and west.

There are currently two broiler chicken rearing houses at Domgay Hall. Under the proposal, two new poultry houses would be constructed to the south of the existing houses. The existing and proposed poultry houses would provide accommodation for up to 192,000 broiler chickens. The houses would be ventilated using uncapped high speed ridge fans, with gable end fans providing additional ventilation during hot weather.

There is one area designated as Ancient Woodland (AW) that is within 2 km of Domgay Hall; AS Modelling & Data Ltd. have not identified any other Local Wildlife Sites (LWSs) within 2 km. There are four Sites of Special Scientific Interest (SSSIs) that are within 5 km of the site, namely: the Montgomery Canal SSSI to the west; the Llanymynech and Llynclys Hills SSSI, to the north-northwest; Gweunydd Ty-Brith SSSI to the west-south-west, Breidden Hill SSSI to the south-south-east and Morton Pool and Pasture SSSI to the north-north-east. The Montgomery Canal SSSI is also designated as a Special Area of Conservation (SAC) and Morton Pool and Pasture SSSI is also designated as a Ramsar site.

A map of the surrounding area showing the site of Domgay Hall, AWs, the SSSIs, the SAC and the Ramsar site is provided in Figure 1. In the figure, AWs are shaded in olive, the SSSIs are shaded in green, the SAC is shaded in purple, the Ramsar site is shaded in blue and the site of Domgay Hall is outlined in blue.

Figure 1. The area surrounding Domgay Hall – concentric circles radii 2.0 km (olive) and 5.0 km (purple)



6.2 Ammonia, Background Levels, Critical Levels & Loads & Emission Rates

6.2.1 Ammonia concentration and nitrogen and acid deposition

When assessing potential impact on ecological receptors, ammonia concentration is usually expressed in terms of micrograms of ammonia per metre cubed of air (µg-NH_3/m_3) as an annual mean. Ammonia in the air may exert direct effects on the vegetation, or indirectly affect the ecosystem through deposition which causes both hyper-eutrophication (excess nitrogen enrichment) and acidification of soils. Nitrogen deposition, specifically in this case the nitrogen load due to ammonia

deposition/absorption is usually expressed in kilograms of nitrogen per hectare per year (kg-N/ha/y). Acid deposition is expressed in terms of kilograms equivalent (of H+ ions) per hectare per year (keq/ha/y).

6.2.2 Background ammonia levels and nitrogen and acid deposition

The background ammonia concentration (annual mean) in the area around Domgay Hall and Montgomery Canal SAC is 2.64 µg-NH3/m3 . The background nitrogen deposition rate to woodland is 35.00 kg-N/ha/y and to short vegetation is 20.58 kg-N/ha/y. The background acid deposition rate to woodland is 2.41 keq/ha/y and to short vegetation is 1.47 keq/ha/y. The source of these background figures is the Air Pollution Information System (APIS, April 2020).

6.2.3 Critical Levels & Critical Loads

Critical Levels and Critical Loads are a benchmark for assessing the risk of air pollution impacts to ecosystems. It is important to distinguish between a Critical Level and a Critical Load. The Critical Level is the gaseous concentration of a pollutant in the air, whereas the Critical Load relates to the quantity of pollutant deposited from air to the ground.

Critical Levels are defined as, "concentrations of pollutants in the atmosphere above which direct adverse effects on receptors, such as human beings, plants, ecosystems or materials, may occur according to present knowledge" (UNECE).

Critical Loads are defined as, "a quantitative estimate of exposure to one or more pollutants below which significant harmful effects on specified sensitive elements of the environment do not occur according to present knowledge" (UNECE).

For ammonia concentration in air, the Critical Level for higher plants is 3.0 µg-NH3/m3 as an annual mean. For sites where there are sensitive lichens and bryophytes present, or where lichens and bryophytes are an integral part of the ecosystem, the Critical Level is 1.0 µg-NH3/m3 as an annual mean.

Critical Loads for nutrient nitrogen are set under the Convention on Long-Range Transboundary Air Pollution. They are based on empirical evidence, mainly observations from experiments and gradient studies. Critical Loads are given as ranges (e.g. 10-20 kg-N/ha/y); these ranges reflect variation in ecosystem response across Europe. The Critical Levels and Critical Loads at the wildlife sites assumed in this study are provided in Table 1. N.B. Where the Critical Level of 1.0 µg-NH3/m3 is assumed, it is usually unnecessary to consider the Critical Load as the Critical Level provides the stricter test. Normally the Critical Load for nitrogen deposition provides a stricter test than the Critical Load for acid deposition. Assuming typical deposition velocities, the strictest test is highlighted with bold text.

Table 1. Critical Levels and Critical Loads at the wildlife sites

Site	Critical Level ($\mu g\text{-}NH_3/m^3$)	Critical Load - Nitrogen Deposition (kg-N/ha/y)	Critical Load - Acid Deposition (keq/ha/y)
AW	**1.0** [1]	-	-
Llanymynech and Llynclys Hills SSSI	**1.0** [1&2]	10.0 [2&3]	-
Gweunydd Ty-Brith SSSI	3.0 [1&2]	**10.0** [2&3]	-
Breidden Hill SSSI	1.0 [1&2]	**5.0** [2,3&4]	-
Montgomery Canal SAC (bankside/marginal vegetation)	**3.0** [1]	n/a	n/a
Morton Pool & Pasture SSSI/Ramsar	3.0 [1&2]	**10.0** [2&3]	-

1. A precautionary figure used where no details of the ecology of the site are available, or the citation for the site contains reference to sensitive lichens and/or bryophytes.
2. Based upon the citation for the site and information from APIS.
3. The lower bound of the range of Critical Loads for the site/species, obtained from APIS.
4. Assuming a deposition velocity for ammonia of 0.02 m/s the Critical Load for nitrogen deposition of 5.0 kg-N/ha/y provides a slightly stricter test than does the Critical level of 1.0 $\mu g\text{-}NH_3/m^3$.

6.2.4 Guidance on the significance of ammonia emissions

In March 2017, Natural Resources Wales (Regulation and Permitting Department, EPP) published Operational Guidance Note 41 (OGN 41), "Assessment of ammonia and nitrogen impacts from livestock units when applying for an Environmental Permit or Planning Permission". This guidance was intended to update the way Natural Resources Wales (NRW) assessed emissions, in particular by changing the thresholds of insignificance and the upper threshold process contributions for designated sites. These designated sites include European sites, such as Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites as well as Sites of Special Scientific Interest (SSSIs). The Natural Resources Wales (Regulation and Permitting Department, EPP) published Operational Guidance Note 20 (OGN 20) coontains essentially the same thresholds.

Table 1 in OGN 41 describes the revised screening distance and thresholds for livestock developments; the threshold of insignificant percentage of the designated site Critical Level or Load is given as 1%; the upper threshold percentage of the designated site Critical Level or Load is given as 8%.

Table 2 in OGN 41 describes the possible outcomes of assessment and for detailed modelling of the application alone, where process contributions, considered in isolation, are up to 1% of the designated site Critical Level or Load, then it should be determined that there is no significant environmental effect/no likely significant effect/damage to scientific interest.

Where process contributions, considered in isolation, are between 1% and 8% of the designated site Critical Level or Load, an in-combination assessment is required. Should the in-combination process contributions be between 1% and 8% of the designated site Critical Level or Load then it should be determined that the application would cause no significant environmental effect/likely significant effect/damage to scientific interest.

When considering process contributions, in isolation or in-combination, if they exceed 1% of the designated site Critical Level or Load it is necessary to consider background concentrations and whether the designated site Critical Level or Load is breached and whether additional controls may be necessary. The application will then be determined based on whether there will be significant environmental effect/adverse effect/damage to scientific interest.

For Local Nature Reserves (LNRs), Local Wildlife Sites (LWSs) and Ancient Woodlands (AWs), the current assessment procedure usually applied is based on the Environment Agency's horizontal guidance, H1 Environmental Risks Assessment, H1 Annex B - Intensive Farming. The following are taken from this document.

"An emission is insignificant where Process Contribution (PC) is 100% at a NNR, LNR, ancient woodland or local wildlife site, your proposal may not be considered acceptable. In such cases, your assessment should include proposals to reduce ammonia emissions."

This document was withdrawn February 1st 2016 and replaced with a web-page titled "Intensive farming risk assessment for your environmental permit", which contains essentially the same criteria. It is assumed that the upper threshold and lower threshold on the web-page refers to the levels that were previously referred to as levels of insignificance and acceptability in Annex B– Intensive Farming.

Within the range between the lower and upper thresholds, whether or not the impact is deemed acceptable is at the discretion of the Environment Agency. N.B. In the case of LWSs and AWs, the Environment Agency do not usually consider other farms that may act in-combination and therefore a PC of up to 100% of Critical Level or Critical Load is usually deemed acceptable for permitting purposes and therefore the upper and lower thresholds are the same (100%).

6.2.5 Quantification of Ammonia Emissions

Ammonia emission rates from poultry houses depend on many factors and are likely to be highly variable. However, the benchmarks for assessing impacts of ammonia and nitrogen deposition are

framed in terms of an annual mean ammonia concentration and annual nitrogen deposition rates. To obtain relatively robust figures for these statistics it is not necessary to model short term temporal variations and a steady continuous emission rate can be assumed. In fact, modelling short term temporal variations might introduce rather more uncertainty than modelling continuous emissions.

The Environment Agency provided an Intensive farming guidance note which lists standard ammonia emission factors for a variety of livestock, including broiler chickens. The emission factor for broiler chickens is 0.034 kg-NH_3/bird place/y; this figure is used to calculate the emissions from the proposed poultry house.

Details of the poultry numbers and types and emission factors used and calculated ammonia emission rates are provided in Table 2.

Table 2. Details of poultry numbers and baseline ammonia emission rates

Source	Animal numbers	Type or weight	Emission factor (kg-NH_3/place/y)	Emission rate (g-NH_3/s)
Existing & Proposed Housing	192,000	Broiler Chickens	0.034	0.206860

6.3 The Atmospheric Dispersion Modelling System (ADMS) and model parameters

The Atmospheric Dispersion Modelling System (ADMS) ADMS 5 is a new generation Gaussian plume air dispersion model, which means that the atmospheric boundary layer properties are characterised by two parameters; the boundary layer depth and the Monin-Obukhov length rather than in terms of the single parameter Pasquill-Gifford class.

Dispersion under convective meteorological conditions uses a skewed Gaussian concentration distribution (shown by validation studies to be a better representation than a symmetrical Gaussian expression).

ADMS has a number of model options that include: dry and wet deposition; NOx chemistry; impacts of hills; variable roughness; buildings and coastlines; puffs; fluctuations; odours; radioactivity decay (and γ-ray dose); condensed plume visibility; time varying sources and inclusion of background concentrations.

ADMS has an in-built meteorological pre-processor that allows flexible input of meteorological data both standard and more specialist. Hourly sequential and statistical data can be processed and all input and output meteorological variables are written to a file after processing.

The user defines the pollutant, the averaging time (which may be an annual average or a shorter period), which percentiles and exceedance values to calculate, whether a rolling average is required or not and the output units. The output options are designed to be flexible to cater for the variety of air quality limits which can vary from country to country and are subject to revision.

6.3.1 Meteorological data

Computer modelling of dispersion requires hourly sequential meteorological data and to provide robust statistics the record should be of a suitable length; preferably four years or longer.

The meteorological data used in this study is obtained from assimilation and short term forecast fields of the Numerical Weather Prediction (NWP) system known as the Global Forecast System (GFS). There are no nearby traditional observational meteorological datasets that could be considered representative of the area around Domgay Hall, or that could be considered as suitable for use as driving data for modelling terrain flow; however, data from the observational meteorological stations at Lake Vyrnwy and RAF Shawbury have been considered, primarily to demonstrate that the use of GFS data provides similar results to traditional observational meteorological data.

The GFS is a spectral model: the physics/dynamics model has an equivalent resolution of approximately 13 km (latterly 9km); terrain is understood to be resolved at a resolution of approximately 2 km, with sub-13 km terrain effects parameterised. Site specific data may be extrapolated from nearby archive grid points or a most representative grid point chosen. The GFS resolution adequately captures major topographical features and the broad-scale characteristics of the weather over the UK. Smaller scale topological features may be included in the dispersion modelling by using the flow field module of ADMS (FLOWSTAR). The use of NWP data has advantages over traditional observational meteorological records because:

• Calm periods in traditional observational records may be over-represented, this is because the instrumentation used may not record wind speeds below approximately 0.5 m/s and start up wind speeds may be greater than 1.0 m/s. In NWP data, the wind speed is continuous down to 0.0 m/s, allowing the calms module of ADMS to function correctly.

• Traditional records may include very local deviations from the broad-scale wind flow that would not necessarily be representative of the site being modelled; these deviations are difficult to identify and remove from a meteorological record. Conversely, local effects at the site being modelled are relatively easy to impose on the broad-scale flow and provided horizontal resolution is not too great, the meteorological records from NWP data may be expected to represent well the broad-scale flow.

• Information on the state of the atmosphere above ground level which would otherwise be estimated by the meteorological pre-processor may be included explicitly

A wind rose showing the distribution of wind speeds and directions in the GFS derived data is shown in Figure 2a.

Wind speeds are modified by the treatment of roughness lengths (see Section 4.7) and where terrain data is included in the modelling, wind speeds and directions will be modified. The terrain and roughness length modified wind rose for Domgay Hall is shown in Figure 2b. Note that elsewhere in the modelling domain the modified wind roses may differ more markedly and that the resolution of the wind field in terrain runs is approximately 180 m. Please also note that FLOWSTAR is used to obtain a local flow field, not to explicitly model dispersion in complex terrain as defined in the ADMS User Guide; therefore, the ADMS default value for minimum turbulence length has been amended.

Data from the meteorological recording stations at Lake Vyrnwy and Shawbury have also been considered. However, neither Lake Vyrnwy nor Shawbury, has an aspect that in any way could be considered similar to Domgay Hall; therefore, it should be noted that the frequency of winds from a particular direction in the Lake Vyrnwy and Shawbury data may be either high or low in comparison to what might occur at Domgay Hall, which means mean concentrations downwind may be either over or under predicted. Additionally, periods of light winds and calms cannot be properly modelled. Therefore, the results obtained using the GFS data, particularly when modified by using FLOWSTAR, should be given more weight when interpreting the results of the modelling. The wind roses for Lake Vyrnwy and Shawbury are shown in Figures 2c and 2d.

Figure 2a. The wind rose. Raw GFS derived data, for 52.766 N, 3.067 W, 2015-2018

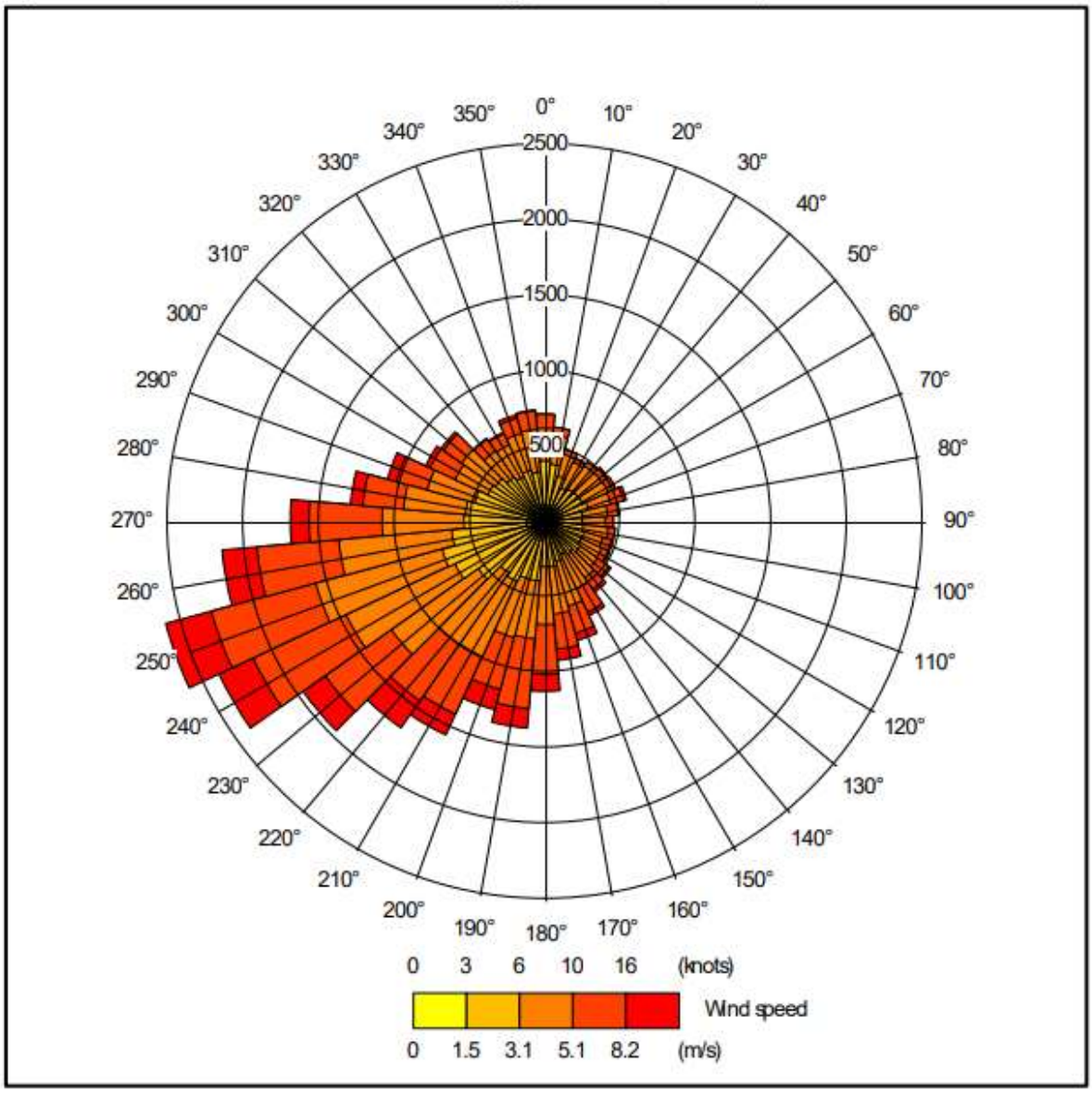


Figure 2b. The wind rose. FLOWSTAR modified GFS derived data for NGR 327050, 319750, 2015-2018

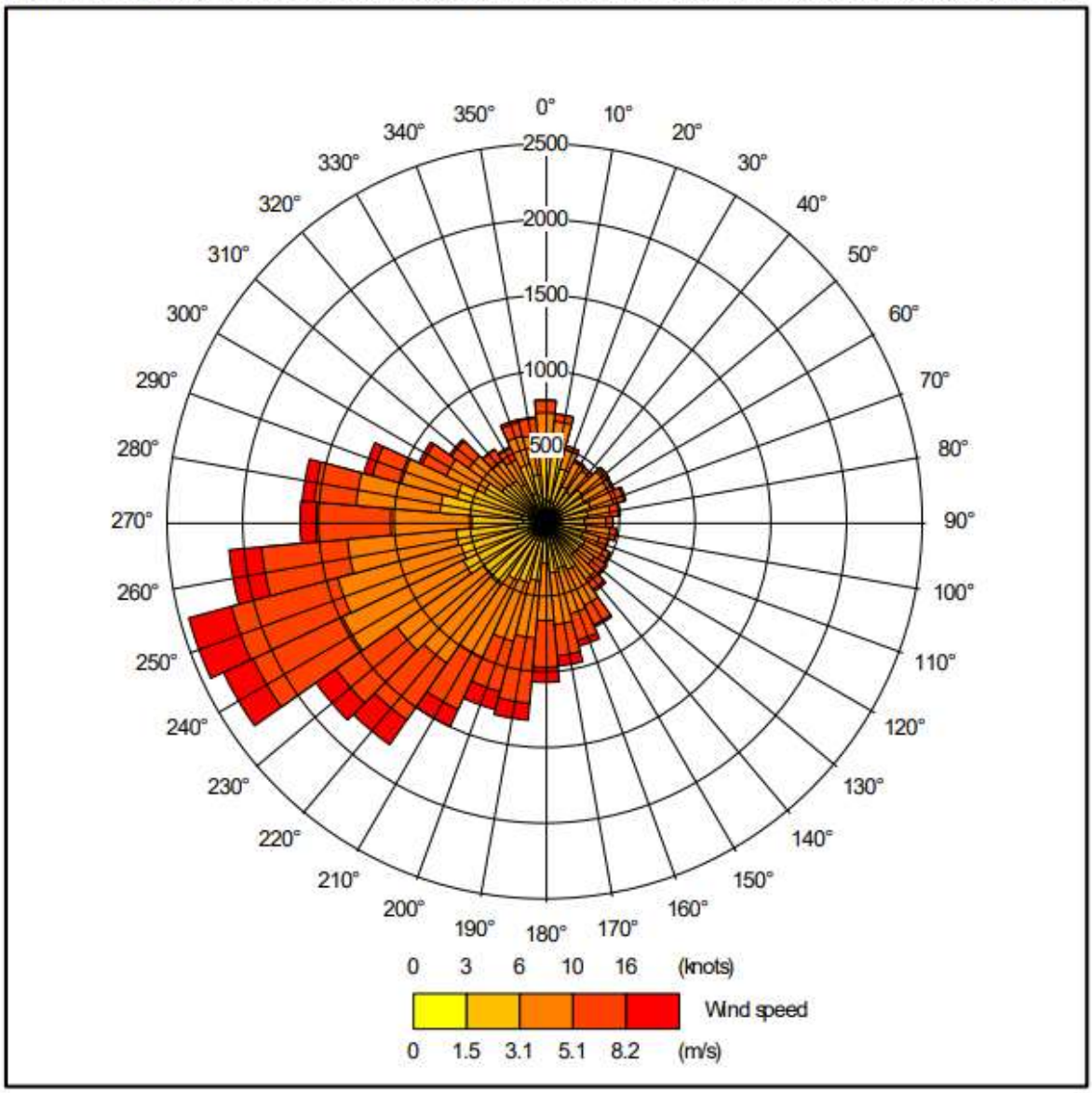


Figure 2c. The wind rose. Recorded meteorological data at Lake Vyrnwy , 2015-2018

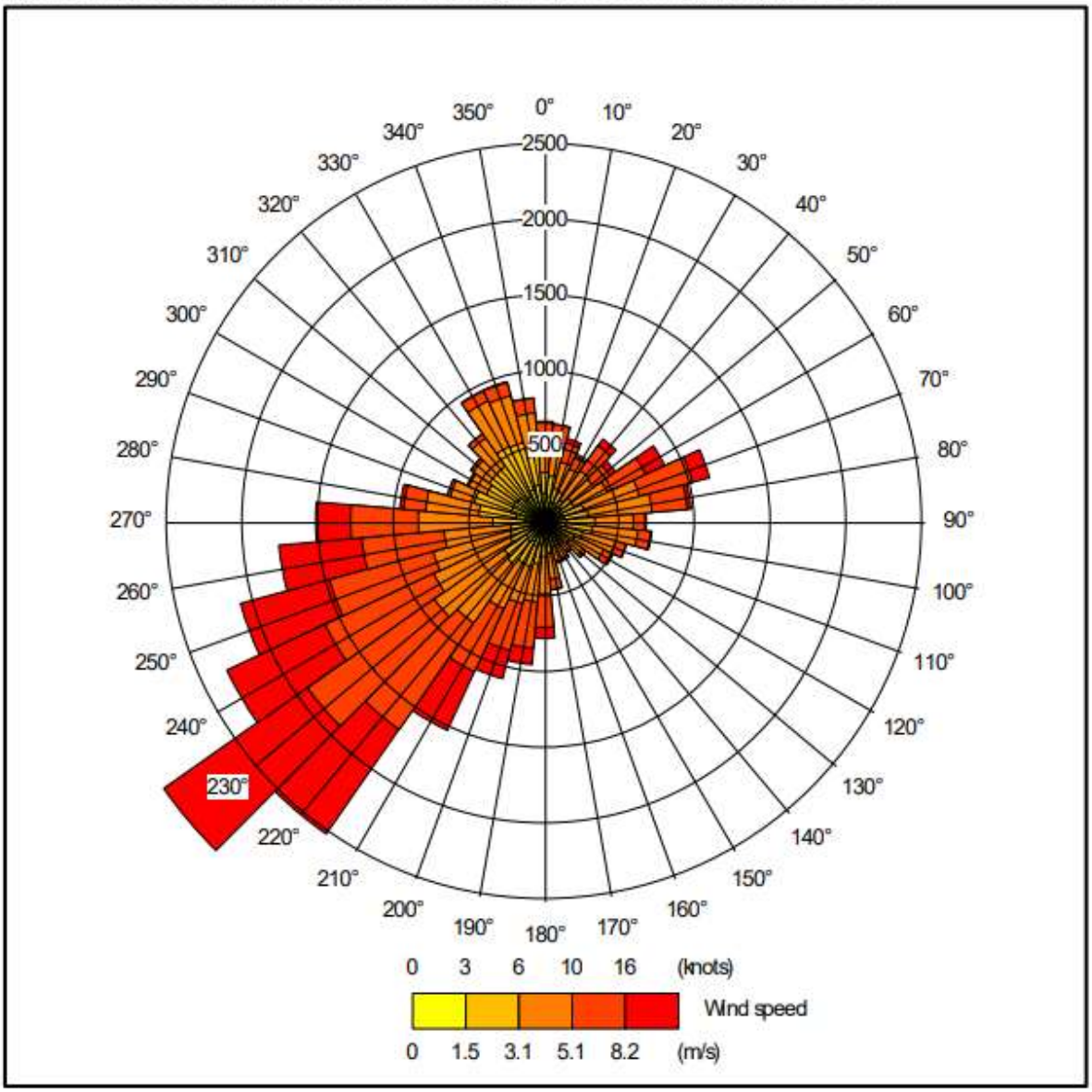
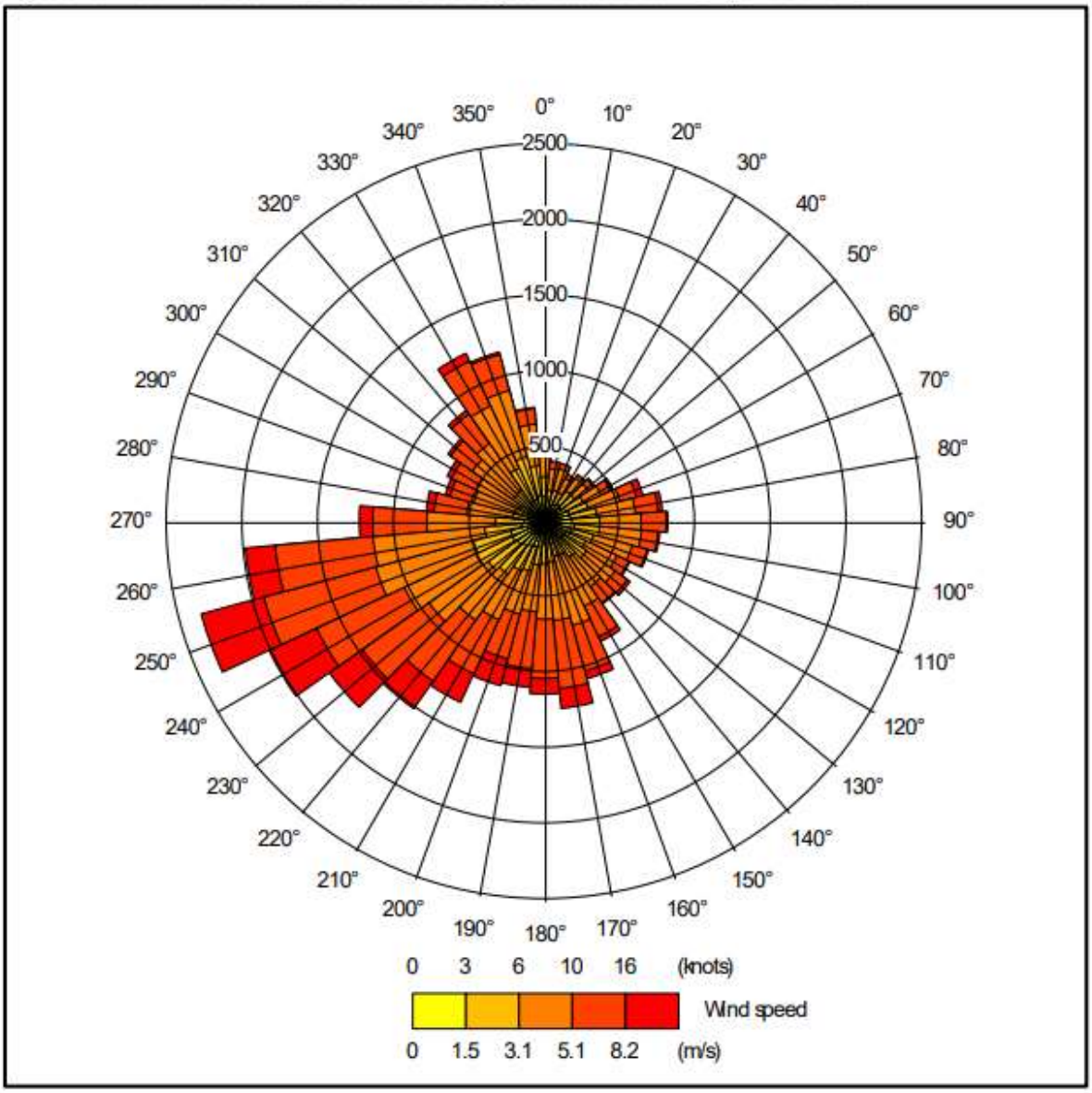


Figure 2d. The wind rose. Recorded meteorological data at Shawbury, 2015-2018



6.3.2 Emission sources

Emissions from the chimneys of uncapped high speed ridge fans on the existing and proposed poultry houses are represented by three point sources per house within ADMS (EX1 and EX2; 1, 2 & 3 and PR1 and PR2; 1, 2 & 3). Details of the point source parameters are shown in Table 3a and the positions of the point sources may be seen in Figure 3

Table 3a. Point source parameters

Source ID	Height (m)	Diameter (m)	Efflux velocity (m/s)	Emission temperature (°C)	Baseline emission rate per source (g-NH_3/s)
EX1 and EX2; 1, 2 & 3	6.0	0.8	11.0	22.0 [2]	0.017238 [1]
PR1 and PR2; 1, 2 & 3	6.0	0.8	11.0	22.0 [2]	0. 017238 [1]

1. Reduced by 50% when the ambient temperature equals or exceeds 21 Celsius.
2. Or ambient temperature, if >22 Celsius.

The existing and proposed houses are/would be fitted with gable end fans which would be used to provide supplementary ventilation in hot weather conditions. The emissions from the gable end fans are represented by a two volume sources within ADMS (EX12_GAB and PR34_GAB). These volume sources are assumed to emit 50% of the total emission only when the ambient temperature equals or exceeds 20 Celsius; when the volume sources are emitting, emissions from the associated point sources are reduced by 50%. Details of the volume source parameters are shown in Table 3b and their positions may be seen in Figure 3.

Table 3b. Volume source parameters

Source ID	Length Y (m)	Width X (m)	Depth (m)	Base height (m)	Emission temperature (°C)	Emission rate (g-NH_3/s)
EX12_GAB	5.0	56.5	3.0	0.0	Ambient	0.051715 [3]
PR34_GAB	5.0	56.5	3.0	0.0	Ambient	0.051715 [3]

3. 50% of the total emission is emitted when the ambient temperature equals or exceeds 21 Celsius.

6.3.3 Modelled buildings

The structure of the existing and proposed poultry houses and other nearby farm buildings may affect the plumes from the point sources. Therefore, the buildings are modelled within ADMS. The positions of the modelled buildings may be seen in Figure 3, where they are marked by grey rectangles.

6.3.4 Discrete receptors

Nineteen discrete receptors have been defined: one at the AW, (1); 10 at the SSSIs (2 to 11); seven at the SAC (12 to 18) and one at the Ramsar site (19). These receptors are defined at ground level within ADMS. The positions of the discrete receptors may be seen in Figure 4, where they are marked by enumerated pink rectangles.

6.3.5 Cartesian grids

To produce the contour plots presented in Section 5 of this report and to define the spatially varying deposition fields used in the detailed modelling, a regular Cartesian grid has been defined within ADMS. The individual grid receptors are defined at ground level within ADMS. The position of the Cartesian grid may be seen in Figure 4, where it is marked by grey lines.

6.3.6 Terrain data

Terrain has been considered in the modelling. The terrain data are based upon the Ordnance Survey 50 m Digital Elevation Model. A 12.0 km x 12.0 km domain has been resampled at 100 m horizontal resolution for use within ADMS for use in the preliminary modelling and detailed. The resolution of FLOWSTAR is 64 x 64 grid points; therefore, the effective resolution of the wind field is approximately 180 m.

6.3.7 Roughness Length

A fixed surface roughness length of 0.25 m has been applied over the entire modelling domain. As a precautionary measure, the GFS meteorological data is assumed to have a roughness length of 0.225 m. The effect of the difference in roughness length is precautionary as it increases the frequency of low wind speeds and the stability and therefore increases predicted ground level concentrations.

Figure 3. The positions of modelled buildings & sources

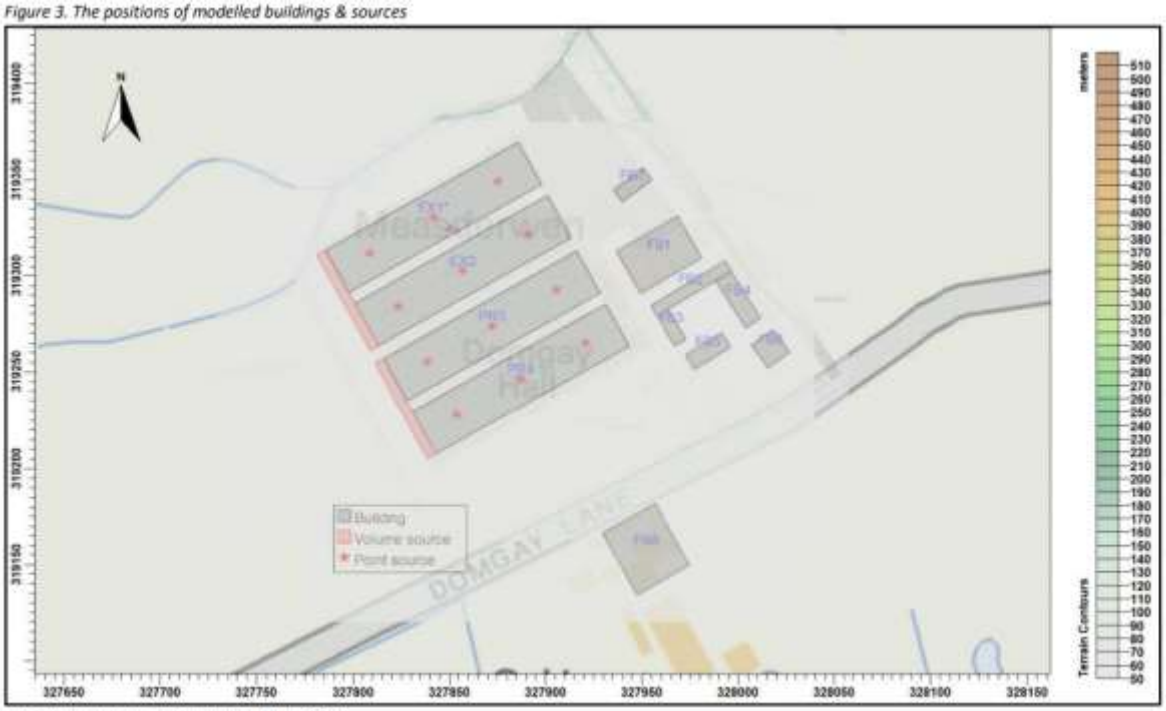
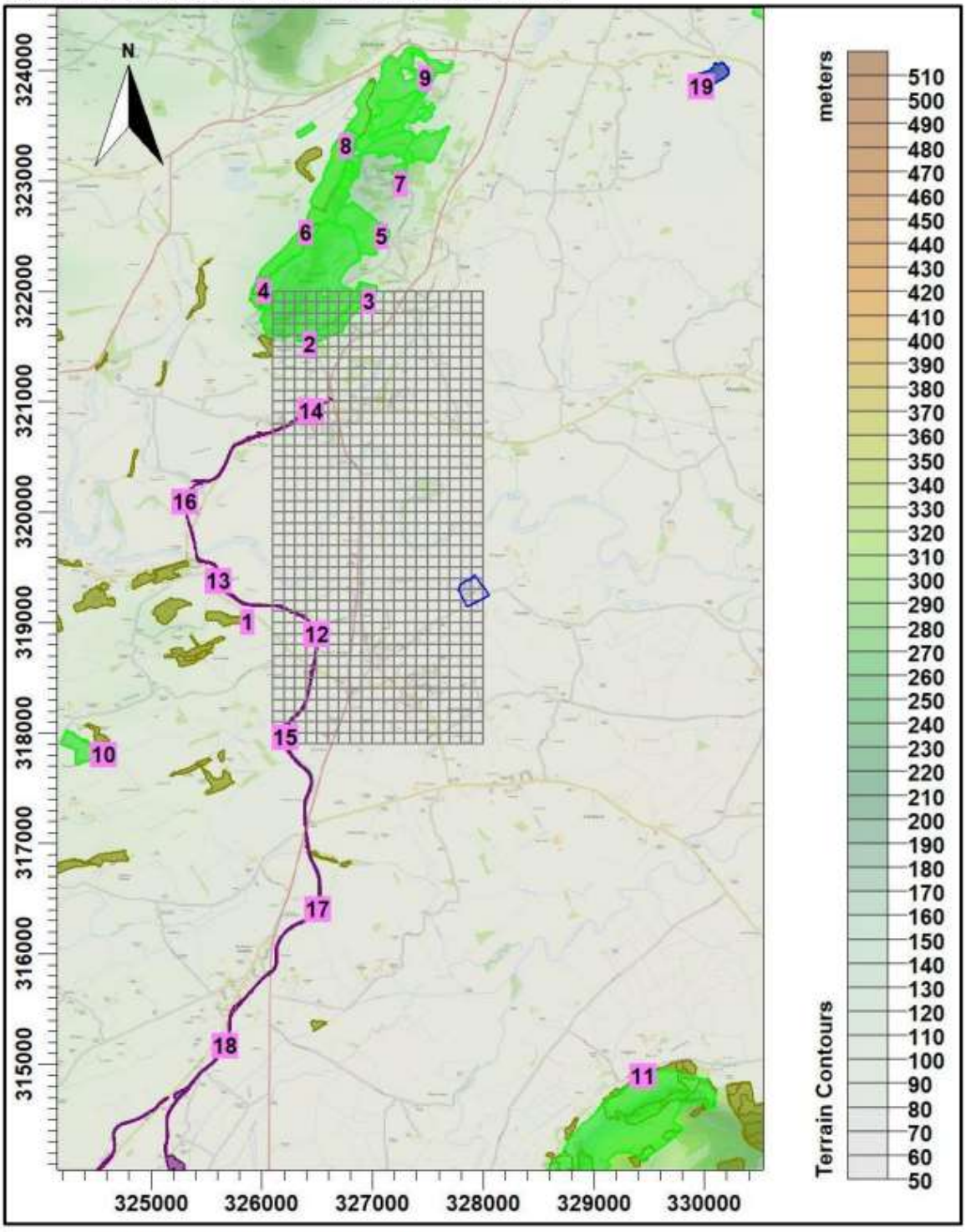


Figure 4. The discrete receptors and Cartesian grid receptors



6.3.8 Deposition

The method used to model deposition of ammonia and consequent plume depletion is based on a document titled "Guidance on modelling the concentration and deposition of ammonia emitted from intensive farming" from the Environment Agency's Air Quality Modelling and Assessment Unit, 22 November 2010. N.B. AS Modelling & Data Ltd. has restricted deposition over arable farmland and heavily grazed and fertilised pasture; this is to compensate for possible saturation effects due to fertilizer application and to allow for periods when fields are clear of crops (Sutton), the deposition is

also restricted over areas with little or no vegetation and the deposition velocity is set to 0.002 m/s where grid points are over the poultry housing and 0.015 m/s over heavily grazed grassland. Where deposition over water surfaces is calculated, a deposition velocity of 0.005 m/s is used.

In summary, the method is as follows:
• A preliminary run of the model without deposition is used to provide an ammonia concentration field.
• The preliminary ammonia concentration field, along with land usage, has been used to define two deposition velocity fields. The deposition velocities used are provided in Table 4

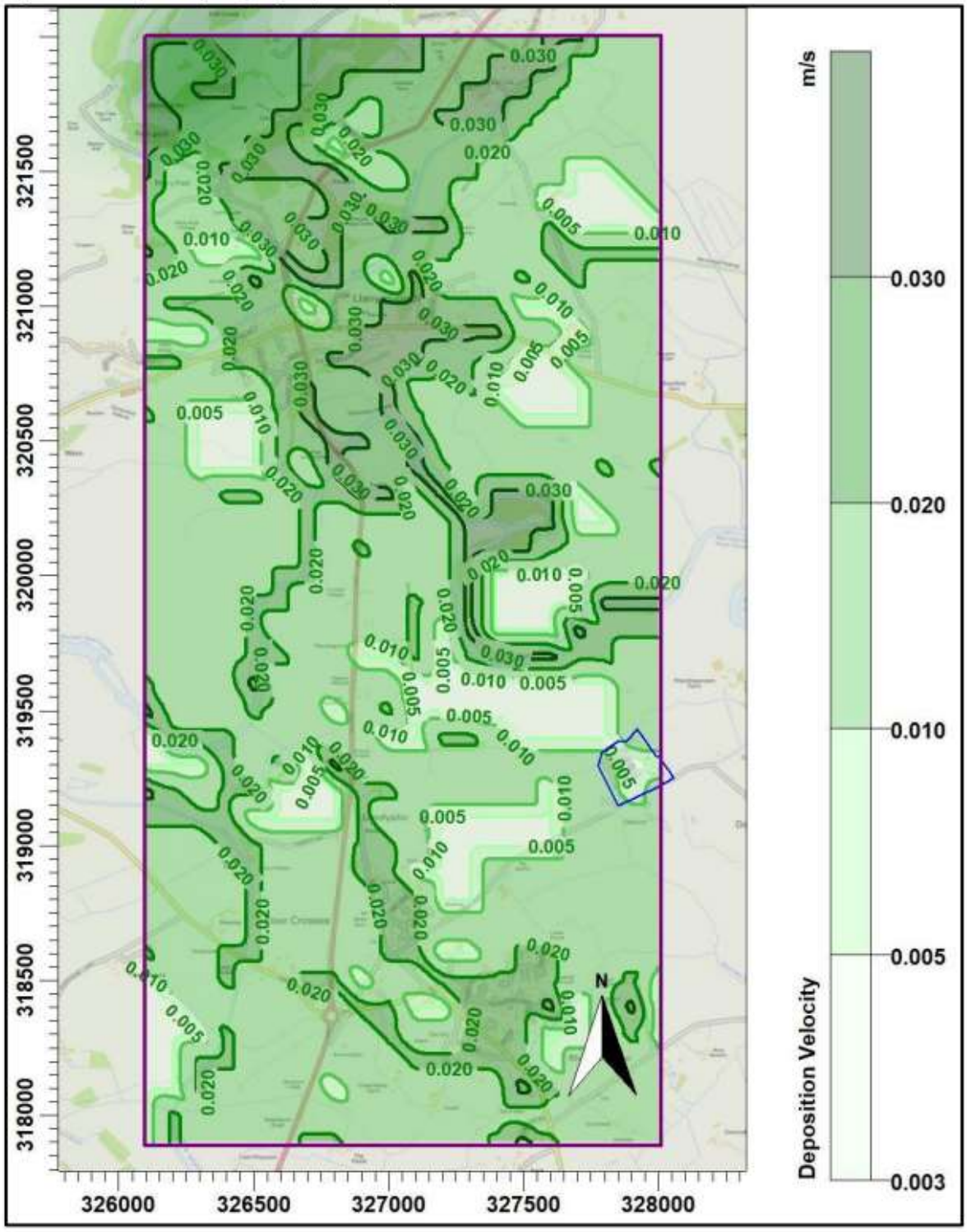
Table 4. Deposition velocities

NH_3 concentration (PC + background) (µg/m³)	< 10	10 - 20	20 - 30	30 – 80	> 80
Deposition velocity – woodland (m/s)	0.03	0.015	0.01	0.005	0.003
Deposition velocity – short vegetation (m/s)	0.02 (0.015 over heavily grazed grassland)	0.015	0.01	0.005	0.003
Deposition velocity – arable farmland/rye grass (m/s)	0.005	0.005	0.005	0.005	0.003

• The model is then rerun with the spatially varying deposition module.

A contour plot of the spatially varying deposition field is provided in Figure 5.

Figure 5. The spatially varying deposition field



6.4 Details of the Model Runs and Results

6.4.1 Preliminary modelling and model sensitivity tests

ADMS was run a total of twenty-eight times, once for each year in the meteorological record in the following seven modes:

- In basic mode without calms, or terrain – GFS data.
- With calms and without terrain – GFS data.

- Without calms and with terrain – GFS data.
- Without calms and with terrain – GFS data with a fixed deposition at 0.003 m/s.
- In basic mode without calms, or terrain – Lake Vyrnwy data.
- In basic mode without calms, or terrain – Shawbury data.

For each mode, statistics for the maximum annual mean ammonia concentration at each receptor were compiled.

Details of the predicted annual mean ammonia concentrations at each receptor are provided in Table 5. In the Table, predicted ammonia concentrations, including those that would lead to a nitrogen deposition rate, that are in excess of the Natural Resources Wales upper threshold (8% of Critical Level or Load for a SSSI/SAC/Ramsar site and 100% of a Critical Level or Load for an AW) are coloured red. Concentrations in the range between the Natural Resources Wales upper threshold and lower threshold (1% to 8% for a SSSI/SAC/Ramsar site and 100% to 100% for an AW) are coloured blue. For convenience, cells referring to the AW are shaded olive, cells referring to the SSSIs are shaded green cells referring to the SAC are shaded green and cells referring to the Ramsar site are shaded blue.

Table 5. Predicted maximum annual mean ammonia concentration rate at the discrete receptors

Receptor number	X(m)	Y(m)	Designation	Maximum annual mean ammonia concentration - (µg/m³)					
				Existing & Proposed					
				GFS No Calms No Terrain	GFS Calms No Terrain	GFS No Calms Terrain	GFS No Calms Terrain Fixed depo 0.003 m/s	Shawbury No Calms No Terrain	Lake Vyrnwy Calms No Terrain
1	325866	319021	AW	0.026	0.026	0.034	0.022	0.049	0.039
2	326425	321533	Llanymynech and Llynclys Hills SSSI	**0.021**	**0.021**	**0.011**	0.008	**0.023**	**0.011**
3	326962	321918	Llanymynech and Llynclys Hills SSSI	**0.026**	**0.026**	**0.012**	0.008	**0.025**	**0.011**
4	326013	322017	Llanymynech and Llynclys Hills SSSI	**0.017**	**0.017**	0.008	0.006	**0.018**	0.009
5	327079	322509	Llanymynech and Llynclys Hills SSSI	**0.022**	**0.022**	0.010	0.007	**0.021**	**0.012**
6	326398	322545	Llanymynech and Llynclys Hills SSSI	**0.017**	**0.017**	0.006	0.004	**0.017**	0.008
7	327249	322983	Llanymynech and Llynclys Hills SSSI	**0.019**	**0.019**	0.009	0.006	**0.019**	**0.012**
8	326756	323333	Llanymynech and Llynclys Hills SSSI	**0.016**	**0.016**	0.007	0.005	**0.015**	0.009
9	327472	323941	Llanymynech and Llynclys Hills SSSI	**0.014**	**0.014**	0.009	0.006	**0.015**	**0.011**
10	324563	317818	Gweunydd Ty-Brith SSSI	0.017	0.017	**0.028**	0.014	**0.021**	0.018
11	329433	314908	Breidden Hill SSSI	**0.019**	**0.019**	**0.010**	0.006	**0.021**	**0.029**
12	326487	318900	Montgomery Canal SSSI/SAC	**0.045**	**0.045**	**0.053**	**0.038**	**0.065**	**0.064**
13	325596	319389	Montgomery Canal SSSI/SAC	0.022	0.022	0.025	0.017	**0.041**	0.029
14	326441	320927	Montgomery Canal SSSI/SAC	0.029	0.028	0.027	0.017	0.029	0.014
15	326202	317969	Montgomery Canal SSSI/SAC	**0.031**	**0.031**	**0.047**	0.029	**0.030**	0.027
16	325300	320106	Montgomery Canal SSSI/SAC	0.019	0.019	0.021	0.014	0.028	0.019
17	326495	316413	Montgomery Canal SSSI/SAC	0.020	0.019	0.030	0.016	0.015	0.015
18	325657	315181	Montgomery Canal SSSI/SAC	0.013	0.013	0.015	0.008	0.011	0.010
19	329967	323867	Morton Pool & Pasture SSSI/Ramsar	0.015	0.015	0.017	0.012	0.017	0.014

6.4.2 Detailed deposition modelling

The detailed modelling, which includes ammonia deposition and the consequent plume depletion, was carried out over a restricted domain covering the poultry houses at Domgay Hall, closer stretches of Montgomery Canal SAC and southern parts of the Llanymynech and Llynclys Hills SSSI, the areas where preliminary modelling (GFS fixed deposition run) indicated that annual mean ammonia concentrations or nitrogen deposition rates would potentially exceed 1% of the Critical Level, which is the Natural Resources Wales lower threshold percentage for a SSSI/SAC.

At the AW, other SSSIs, and the Ramsar site, the preliminary modelling indicated that ammonia levels (and nitrogen deposition rates) would be below Natural Resources Wales relevant lower threshold percentage of the Critical Level/Load for the designation of the site.

The detailed deposition modelling run was made with terrain included. Calms cannot be used with terrain or spatially varying deposition; however, the results of the preliminary runs demonstrate that the effect of calms upon the modelling is not significant.

The predicted maximum annual mean ground level ammonia concentrations and nitrogen deposition rates at the discrete receptors within the detailed modelling domain are shown in Table 6. In the Table, predicted ammonia concentrations or nitrogen deposition rates that are in excess of the Natural

Resources Wales upper threshold (8% of Critical Level or Load for a SSSI) are coloured red. Concentrations that are in the range between the Natural Resources Wales lower and upper threshold (1% to 8% for a SSSI) are coloured blue.

Contour plots of the predicted ground level maximum annual mean ammonia concentration and maximum nitrogen deposition rate are shown in Figures 6a and 6b, respectively.

Table 6. Predicted maximum annual mean ammonia concentrations and nitrogen deposition at the discrete receptors – for bankside vegetation

Receptor number	X(m)	Y(m)	Name	Site Parameters			Maximum annual ammonia concentration		Maximum annual nitrogen deposition rate	
				Deposition Velocity	Critical Level (µg/m³)	Critical Load (kg/ha)	Process Contribution (µg/m³)	%age of Critical Level	Process Contribution (kg/ha)	%age of Critical Load
2	326425	321533	Llanymynech and Llynclys Hills SSSI	0.030	1.0	10.0	0.0060	0.596	0.05	0.5
3	326962	321918	Llanymynech and Llynclys Hills SSSI	0.030	1.0	10.0	0.0055	0.546	0.04	0.4
12	326487	318900	Montgomery Canal SSSI/SAC	0.030	3.0	-	0.0299	0.996	0.23	-
14	326441	320927	Montgomery Canal SSSI/SAC	0.030	3.0	-	0.0130	0.434	0.10	-
15	326202	317969	Montgomery Canal SSSI/SAC	0.030	3.0	-	0.0221	0.737	0.17	-

Figure 6a. Predicted maximum annual mean ammonia concentrations

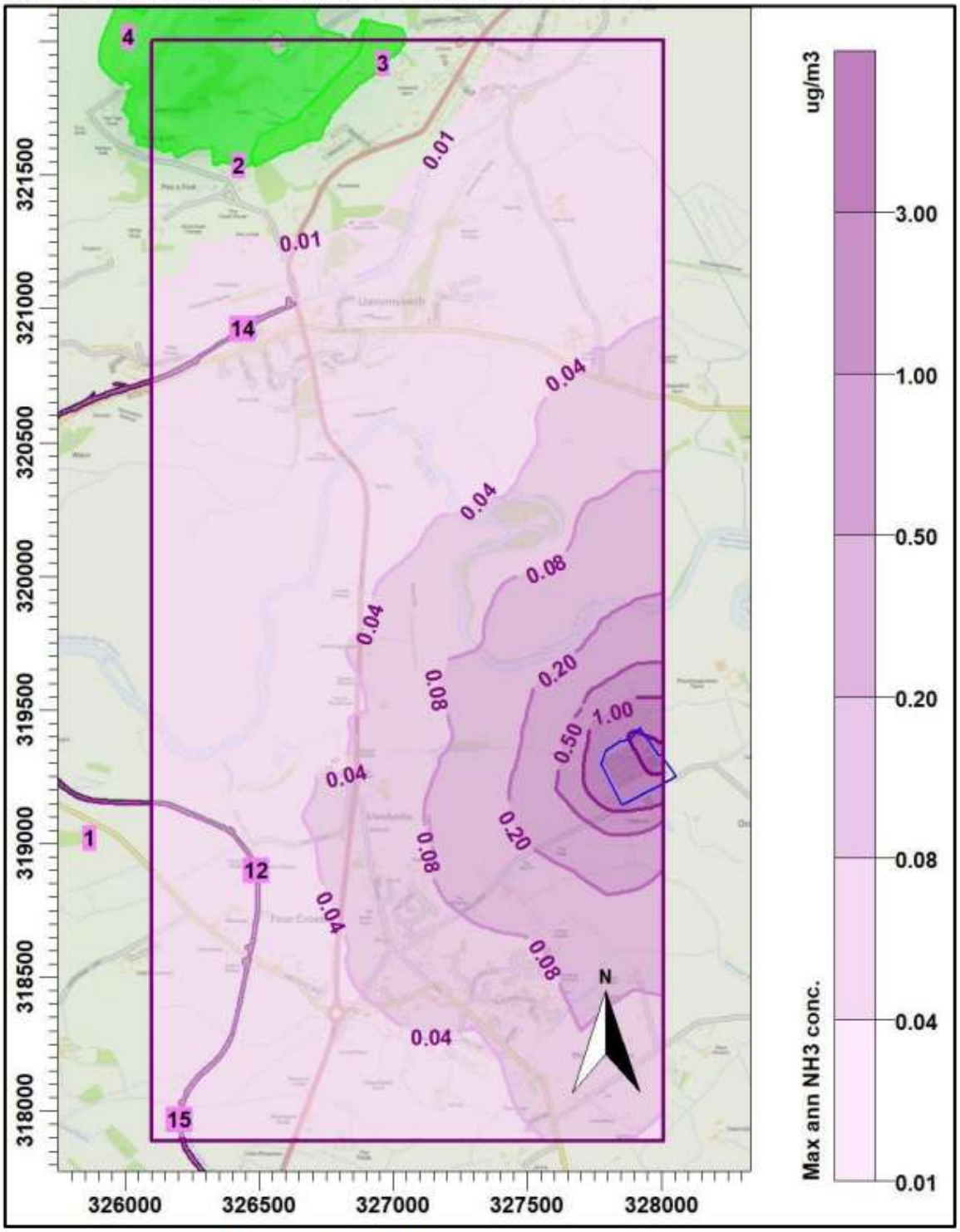
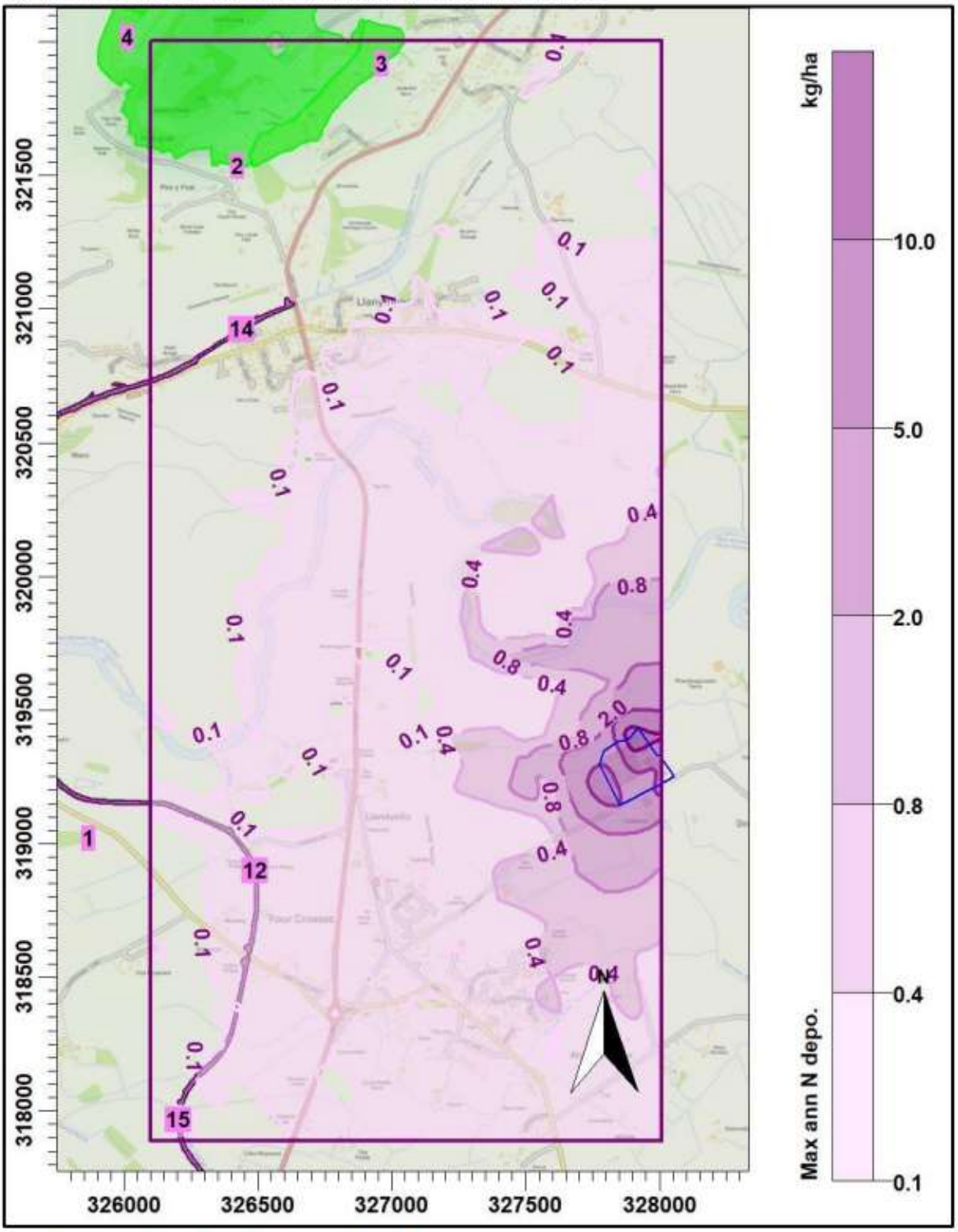


Figure 6b. Predicted maximum annual nitrogen deposition rates



6.5 Summary and Conclusions

AS Modelling & Data Ltd. has been instructed by Mr. Richard Corbett, of Roger Parry & Partners LLP, on behalf of Mr. M. Evans, to use computer modelling to assess the impact of ammonia emissions from the existing and proposed broiler chicken rearing houses at Domgay Hall, Four Crosses, near to Llanymynech in Powys. SY22 6SN.

Ammonia emission rates from the existing and proposed poultry houses have been assessed and quantified based upon the Environment Agency's standard ammonia emission factors. The ammonia emission rates have then been used as inputs to an atmospheric dispersion and deposition model which calculates ammonia exposure levels and nitrogen and acid deposition rates in the surrounding area.

The modelling predicts that:

- The process contribution from the existing and proposed poultry houses to the annual ammonia concentration and the nitrogen deposition rate would be below the Natural Resources Wales lower threshold percentage of the Critical Level and/or Load (1% for a SSSI/SAC) at the Montgomery Canal SAC, Llanymynech and Llynclys Hills SSSI, Gweunydd Ty-Brith SSSI and Breidden Hill SSSI.
- The process contribution from the existing and proposed poultry houses to the annual ammonia concentration and the nitrogen deposition rate would be below the Natural Resources Wales lower threshold percentage of the Critical Level and/or Load (100 % for a AW) at all AWs considered.

CHAPTER 7 – LANDSCAPE & VISUAL IMPACT ASSESSMENT

7. Landscape and Visual Assessment

This chapter of the ES has examined the potential impacts of the development on the landscape and visual amenity of the study area. It has considered the potential direct impacts on the fabric of the landscape and the potential impacts on the perception of landscape character. The assessment has also considered the potential impacts of the poultry development on visual amenity. Overall, the assessment established that the poultry installation will change the baseline conditions in terms of both landscape character and visual amenity. Measures factored into the site selection and design process will reduce or minimise any potential adverse effects. Therefore, on balance it is considered that the poultry development facility would be acceptable in this context.

7.1 Introduction

This chapter assesses the potential impacts of the poultry development at Domgay Hall on the landscape resource and visual amenity. It addresses the following issues:

- Impacts on the landscape resource;
- Impacts on the perception of the landscape; and
- Impacts on visual amenity.

Landscape impacts are changes in the landscape resource and perception of the landscape, and differ from visual impacts, which relate to the appearance of these changes and the resulting impact on visual amenity. The landscape and visual assessment is organised into the following main sections:

- **Introduction**;
- **Scope and Method of Assessment** – an explanation of how the assessment has been carried out, with reference to an accepted published, methodologies and guidelines;
- **Context of the Development** – introduction to the study area used in the assessment and the planning context of the site and development;
- **Project Description** – a description of the aspects of the development with the potential to cause an impact on landscape and visual amenity in the study area;
- **Assessment of Impacts** – including an assessment of impacts on landscape features, perception of the landscape and visual amenity. The potential cumulative impacts associated with other developments are also considered; and
- **Conclusion** – an overview of the landscape and visual impacts arising from the development.

7.2 Scope & Method of Assessment

7.2.1 General Approach

The landscape and visual assessment (including elements relating to lighting), has been based on guidelines provided in the following publications:

- Guidelines for Landscape and Visual Impact Assessment (Landscape Institute and Institute of Environmental Assessment, 3rd Edition, 2013); and

The general approach to the landscape and visual assessment (LVA) includes the following key tasks:

- Desk study and preliminary site survey;

- Baseline landscape and visual assessment (consisting of desk study, field survey and reporting); and
- Assessment of residual landscape and visual impacts.

7.2.2 Baseline Assessment

The first stage of the assessment reviewed the existing landscape and visual resource of the study area in terms of its character, quality (i.e. condition) and sensitivity. The baseline assessment forms the basis against which the magnitude and significance of the predicted landscape and visual impacts arising from the development are assessed. The assessment is focussed on a 2km radius study area (indicated on Appendix 9), centred on the development. The size of the study area has also been based on the scale, context and likely visibility of the poultry development.

The baseline assessment has three elements as follows:

- Description – the process of collecting and presenting information about landscape and visual resources in a systematic manner;
- Classification – analytical activity whereby landscape resources, in particular, are refined into units of distinct and recognisable character; and
- Evaluation – the process of attributing a sensitivity to a given landscape or visual resource, by reference to specified criteria.

The baseline assessment process comprises three stages: desk study, field survey and analysis.

7.2.3 Desk Study

As part of the desk study, the baseline landscape and visual resource was defined within a 2km radius study area and the main users of the area, key viewpoints and key features were identified. Existing map and written data about the application site and its environs within the study area were reviewed, including:

- Countryside Council for Wales - LANDMAP
- Ordnance Survey map data;
- Detailed survey data for the application site; and
- Plans, elevations and cross–sections of the development.

The desk study also identified and classified potential visual receptors according to their associated land use (settlements, footpaths, roads etc). The aim of the baseline visual assessment was to ensure that a representative range of viewpoints were included in the visual assessment. The potential extent of visibility of the development was identified by reference to Ordnance Survey map data and observations made in the field. Following this, potential visual receptors likely to be affected by the development were identified and a preliminary selection of viewpoints was made to ensure that the viewpoint assessment included a representative range in relation to the following criteria:

- Type of receptor – based on the above, and including different landscape character types;
- Elevation;
- Distance of receptor from development; and

- Direction of the receptor from the development, with the aim of achieving a distribution from different compass points around the application site.

The desk study provided the basis for subsequent field survey work. It enabled the analysis of the potential zone of visibility, and identification of the principal viewpoints and receptors, which were subsequently confirmed during the field study.

7.2.4 Field Survey

Field survey was undertaken to verify the landscape character types identified within the study area and gain a full appreciation of the relationship between the development and the receiving landscape. The landscape assessment was undertaken using standard field survey forms for each character type, which record dominant land cover, landscape elements and aesthetic factors.

Field survey work also verified the appropriateness of the proposed assessment viewpoints. This involved checking the initial viewpoint selection on the ground, to ensure that there would be views of the development from these locations. In some instances, this can be remedied by slight adjustments to the location, although this has to remain relevant to the particular receptor(s) for which the viewpoint was selected. It is also important to ensure that the selected viewpoints are a representative view, and demonstrate the maximum potential visibility of the development for the selected location. The fieldwork was supported by analysis of Ordnance Survey maps, and observations were supported with photographs.

7.2.5 Analysis and Reporting

Analysis and reporting of the baseline assessment took place after completion of the desk and field surveys. The baseline landscape assessment provided a description, classification and evaluation of the landscape of the study area, from which to assess the potential landscape impacts of the development. The baseline visual assessment provided an initial list of locations for the viewpoint assessment, with details regarding grid references, distance from the development, receptor types and rationale for selection, from which to assess the potential visual impacts of the proposals. The baseline assessment is supported by Appendix 4 which illustrates the landscape context and relevant designations for the application site and study area.

The baseline assessment, as a whole, therefore provides a robust description of the landscape and visual resource. This provides a basis from which to assess the landscape and visual impacts of the development and advises in landscape and visual terms, on the development's acceptability in principle. It also informs the preferred siting, layout and design of the development. The baseline assessment contributed to influencing the project design and the development of mitigation measures.

7.2.6 Assessment of Residual Landscape and Visual Impacts

The impact assessment aims to:

- Identify systematically all the potential landscape and visual impacts of the development taking account of the proposed mitigation measures;
- Predict and estimate their magnitude as accurately as possible; and
- Assess their significance in a logical and well–reasoned fashion.

The assessment describes the changes in the character and quality of the landscape and visual resources that are expected to result from the development. It covers both landscape impacts, i.e. changes in the fabric, character and key defining characteristics of the landscape; and visual impacts, i.e. changes in available views of the landscape and the significance of those changes on people.

In assessing landscape impacts, the potential direct impacts on the fabric of the landscape are considered, together with the potential impacts on the perception of landscape character. The latter depends on a number of factors:

- The nature of the landscape character type, including factors such as the nature of views and sense of enclosure;
- The extent of the potential visibility of the development (e.g. the number and extent of the development seen);
- The proportion of the character type with potential visibility; and
- The distance to the development.

The baseline landscape character assessment together with an assessment of the potential impacts on each character type, along with consideration of the extent of potential significant impacts on the landscape, is included in the assessment.

A visibility assessment has been carried out using Ordnance Survey data and field observations to ascertain the general extent of visibility of the development within the study area. The visibility assessment has concentrated mainly on publicly accessible areas such as the road network, public footpaths, residential and outdoor recreational areas.

A viewpoint analysis has been carried out to identify and evaluate the potential impacts on, and visual amenity arising from, the development at specific representative locations in the study area. The viewpoints selected are considered to be representative of the spectrum of receptors in the study area, located at different distances, directions and elevations relative to the development.

7.2.7 Assessment Criteria

The aim of the environmental assessment is to identify, predict and evaluate potential key impacts arising from the development. Identified impacts are quantified wherever possible; however, the nature of landscape and visual assessment requires an element of interpretation using professional judgement. In order to provide a level of consistency to the assessment, the prediction of magnitude and assessment of significance of the residual landscape and visual impacts have been based on pre–defined criteria.

The **sensitivity of the landscape** is not absolute and varies according to the nature of existing landscape, the nature of the development and the type of change being considered. The determination of the sensitivity of the landscape resource to changes associated with the development is defined as high, medium, low or negligible and is based on professional interpretation of a combination of parameters, as follows:

- Landscape value – as reflected by local, regional or national landscape designations;
- Landscape scale – which is the relative size of the main landscape elements and components; and
- The nature of views – whether open, closed, long or short distance, simple or diverse.

Landscape sensitivity is defined as high, medium or low as set out in Table 14 below:

Table 14: Influence of Parameters on the Sensitivity of the Landscape

Landscape Value	Landscape Scale	Nature of Views	Sensitivity
High	Small	Panoramic, Long Distance	High
Medium	Medium	Open, Medium Distance	Medium

Landscape Value	Landscape Scale	Nature of Views	Sensitivity
Low	Large	Closed, Short Distance	Low

The **sensitivity of visual receptors** is based on an interpretation of a combination of parameters as follows:

- The location of the viewpoint;
- The context of the view;
- The activity of the receptor; and
- Frequency and duration of the view.

Visual receptor sensitivity is defined as high, medium, low or negligible as follows:

Table 15: Definition of Visual Receptor Sensitivity

High sensitivity	e.g. users of outdoor recreation such as rights of way or communities where the development would result in changes in landscape setting or valued views.
Medium Sensitivity	e.g. people travelling through past the affected landscape.
Low sensitivity	e.g. people at their places of work.
Negligible	e.g. views from heavily industrialised areas

The **magnitude of change** arising from the development at any particular viewpoint is described as substantial, moderate, slight or negligible based on the interpretation of a combination of largely quantifiable parameters, as follows:

- Distance of the viewpoint from the development;
- Duration of impact;
- Angle of view in relation to main receptor activity;
- Proportion of the field of view occupied by the development;
- Background to the development; and
- Extent of other built development visible, particularly vertical elements.

Definitions of magnitude are given within Guidelines for Landscape and Visual Impact Assessment (3rd Edition 2013). Table 16 below provides the definitions of magnitude used for the purposes of this assessment.

Table 16: Definitions of Magnitude

Level of Magnitude	Definition of Magnitude
Substantial	Total loss or major alteration to key elements / features / characteristics of the baseline (pre–development) conditions such that post development character/composition of baseline would be fundamentally changed.
Moderate	Partial loss or alteration to one or more key elements / features / characteristics of the baseline (pre–development) conditions such that post development character/ composition/ attributes of baseline would be partially changed.
Slight	Minor loss of or alteration to one or more key elements / features/ characteristics of the baseline (pre–development) conditions. Change arising from the loss / alteration would be discernible but underlying character / composition of the baseline condition would be similar to pre development circumstances / patterns.

Level of Magnitude	Definition of Magnitude
Negligible	Very minor loss or alteration to one or more key elements/ features / characteristics of the baseline (pre–development) conditions. Change barely distinguishable, approximating to the "no change" situation.

The significance of any identified landscape or visual impact has been assessed as major, moderate, minor or no impact. These categories have been determined by consideration of the landscape or visual sensitivity and the predicted magnitude of change as described above, with the following matrix (Table 17) used as a guide to correlating sensitivity and magnitude to determine significance of impacts.

Table 17: Correlation of Sensitivity and Magnitude of Impact to Determine the Significance of Impacts

Landscape & Visual Sensitivity	Magnitude of Change			
	Substantial	**Moderate**	**Slight**	**Negligible**
High	Major	Major / moderate	Moderate	Moderate / minor
Medium	Major / Moderate	Moderate	Moderate / minor	Minor
Low	Moderate	Moderate /minor	Minor	Minor / none
Negligible	Moderate / minor	Minor	Minor / none	None

Where the landscape or visual impacts have been classified as major or major/moderate, this is considered to be a significant impact referred to in The Town and Country Planning (Environmental Impact Assessment) Regulations 2017. It should be noted that significant impacts need not be unacceptable or necessarily negative and may be reversible. The potential impacts associated with the development are referred to as adverse, neutral or positive where applicable.

The matrix is not used as a prescriptive tool, and the methodology and analysis of potential impacts at any particular location must make allowance for the exercise of professional judgement. Thus, in some instances a particular parameter may be considered as having a determining impact on the analysis.

7.2.8 Limitations of the Assessment

Given the degree of subjectivity inherent in landscape and visual assessment there are no methods to quantify effects. As such, the following assessment relies on professional judgement and experience.

7.3 Context of the Development

This section provides a general description of the landscape and visual context of the application site and study area.

7.3.1 The Application Site and Immediate Surroundings

The location of the site is illustrated on Appendix 1. It consists of an arable field.

There are 5 properties within 1km of the site the closest of which is 105 metres distant.

The site will be accessed by HGVs via the A483 between Llanymynech and Four Crosses. The site is accessed off Domgay Lane.

Views of the site are frequently restrained by intervening hedgerow, mature trees and the surrounding topography.

7.3.2 The Study Area

The study area for the landscape and visual assessment comprises a 2km radius circle centred on the application site, as shown on Appendix 9. The study area is predominately rural.

Topographical Features

The application site includes the broad platform dominated by fluvioglacial sheet deposits with some minor glaciolacustrine deposits in the Four Crosses area on the western side of the Severn valley; the fill of the wide valley in the Sarnau area, which links the Severn and Vyrnwy valleys and the SE apron of the Vyrnwy valley which is also dominated by fluvioglacial sheet deposits, etc. Gentle surface undulations typical and marshy areas. Also includes similar areas SE to Guilsfield and a broad cwm-like area of infill. Gaer bank in the Sarnau valley is probably a low mound of bedrock Ordovician deposits.

Land Cover

Land cover is predominantly arable farmland with large open fields indicative of the intensified farming activities; the landscape has suffered significant destruction of features as a result of agricultural intensification since the Second World War.

Mature hedgerow oaks and hedgerow patterns, small broad-leafed woodlands and field ponds break up the landscape.

Settlements

There are several settlements within the study area, ranging from very small hamlets to larger villages. Nearby villages include Four Crosses, Llanymynech and Llandysilio. The site cannot be seen from nearby settlements.

Infrastructure

The A483 lies to the west of the Domgay Hall site, the surrounding local road network is used as commuter routes and a substantial amount of agricultural traffic.

Tourism and Recreation

There is an abundance of surrounding rights of way that are used by ramblers, walkers, cyclists and horse riders.

7.3.3 Landscape Character

Geological Landscape

Geological Landscape		
Aspect Area Name	**Four Crosses-Guilsfield-Sarnau**	Crown Copyright. All rights reserved CCW 100018813 2005
Aspect Area Classification	**Lowland hills and valleys/Lowland glacial and fluvioglacial depositional terrain/Lowland glacial outwash plain / field (Level 3)**	
Aspect Area Code	**MNTGMGL682**	
Date Of Survey : 25/10/2005		

Description

What is the geographical and topographical character of this area?	Includes the broad platform dominated by fluvioglacial sheet deposits with some minor glaciolacustrine deposits in the Four Crosses area on the western side of the Severn valley; the fill of the wide valley in the Sarnau area, which links the Severn and Vyrnwy valleys and the SE apron of the Vyrnwy valley which is also dominated by fluvioglacial sheet deposits, etc. Gentle surface undulations typical and marshy areas. Also includes similar areas SE to Guilsfield and a broad cwm-like area of infill. Gaer bank in the

	Sarnau valley is probably a low mound of bedrock Ordovician deposits.
What is the characteristic Level 3 component of the area?	Lowland glacial outwash plain / field
Which of the following is a significant contributor to the geological character of the area?	Stratigraphic formation(s) (Minor Ordovician mudrocks (?Ashgill).) Superficial deposits (Glacial sand and gravel dominant also with glaciolacustrine deposits and probably also minor alluvium and terrace deposits (Quaternary: Pleistocene-Recent).) Active processes (Stream.) Past processes (Glacial, lacustrine.)
What Level 4 components are notable in this area?	Former lake (e.g. silted up) Urban / industrial development
What active geological and geomorphological processes are significant in this area?	Stream.
Are there components of significant hydrological importance?	Yes (Stream.)
Are there any pedological processes that are significant in the area or have had a landscape forming effect?	Not known
Is there current mineral extraction?	No
Has there been mineral extraction in the past?	Yes (Glacial sand and gravel)
Are there SSSI/GCR sites here?	No
Are there geological SINC, 2nd tier, or RIGS sites in the area?	No
Evaluation	
Value	Moderate (Typical landscape of geomorphological feature and deposits. No notable sites recorded.)
Condition	Good (Dominantly rural area with limited development.)
Trend	Constant (Dominantly rural area with limited development.)
Recommendations	
Existing management	Generally Appropriate
Principal management recommendations	Maintain landscape character and ensure that no significant geological or geomorphological features are lost or damaged.
Guideline	Long Term (Maintain landscape character and ensure that no significant geological or geomorphological features are lost or damaged.) Medium Term (No contemporary geological map available for part of area: encourage systematic geological mapping of the area to properly document geological character.)
Tolerance To Change	
Are there any significant threats to the current integrity and condition of the Earth Heritage features of the area?	No
Aspect Area Boundary	
To what level was this information site-surveyed?	Level 3
At 1:10,000, how much of the Aspect Area boundary is precise?	None (Aspect Area boundaries surveyed at 1:10,000, mapped at 1:25,000.)
What baseline information source was used for Aspect Area boundary mapping?	Other (British Geological Survey maps, aerial photographs, OS 1:25,000 Landranger topographical map.)
If OS Data was used, what was the scale?	1:25,000
What is the justification for the Aspect Area boundaries?	Break of slope at base of solid geology massif and features at edge of active river/floodplain system.
Evaluation Matrix	

Evaluation Criteria: Research Value	Moderate (Typical landscape of geomorphological feature and deposits. No notable sites recorded.)
Evaluation Criteria: Educational Value	Low (No notable sites recorded)
Evaluation Criteria: Historical Value	Low (No notable sites recorded)
Evaluation Criteria: Rarity / Uniqueness	Low (Typical landscape of geomorphological feature and deposits. No notable sites recorded)
Evaluation Criteria: Classic Example	Low (No notable sites recorded)
Evaluation Criteria: Overall Evaluation	Moderate (Typical landscape of geomorphological feature and deposits. No notable sites recorded)
Justification of overall evaluation	Typical landscape of geomorphological feature and deposits. No notable sites recorded.
Bibliography	
List the key sources used for this assessment	British Geological Survey (2000), Sheet 137: Oswestry (1:50000); Ordnance Survey (1998), Explorer 239 (1:25,000 scale); Ordnance Survey (2000a), Explorer 240 (1:25,000 scale).
Assessment	
Additional Assessments	None.
Additional Comments	Additional Level 4 features include: Stream; Disused quarry; Marsh/bog/fen.
Monitoring	
Has the information ever been verified in the field?	Yes (Field transect.)
Does this area have a special or functional link with an adjacent area?	Yes (Part of broader Wye-Vyrnwy valleys outwash plain.)
Description	
If Classification is "Other", specify here	N/A.
Recommendations	
Existing management remarks:	Dominantly rural area with limited development.
Description	
Where drift dominated, what is the dominant drift deposit?	Fluvioglacial
Where drift dominated, what is the major sediment that characterises the area?	

Landscape Habitat

Landscape Habitats		
Aspect Area Name		Crown Copyright. All rights reserved CCW 100018813 2005
Aspect Area Classification	**Dry (Relatively) Terrestrial Habitats/Mosaic/Mosaic (Level 3)**	
Aspect Area Code	**MNTGMLH033**	
Date Of Survey : 19/09/2005		

Monitoring	
Does this area have a special or functional link with an adjacent area?	Yes (The River Severn flows through this aspect area into MONTLH101 Newtown and beyond into MONLTH051.)
What is the total land area within the boundary (in hectares)?	12481 ha
Description	

What are the dominant soil types? (specify up to 3 types)	Brown soils Ground-water gley soils
What Phase 1 habitat types are present? Only select the five most dominant types and, for each of these, specify below what percentage of the Aspect Area is made up of these.	Semi-natural Broadleaved Woodland (3) Planted Coniferous Woodland (2) Improved Grassland (71) Arable (17) Buildings (2)
Does the area contain habitats of international importance?	Yes
Does the area contain BAP habitats?	Yes
Does the area contain protected sites?	Yes
If yes, which ones?	SSSI (MONTGOMERY CANAL SSSI GWAUN BRYN (BRYN PASTURE) SSSI GRANLLYN KINGSWOOD MEADOW SSSI)
Approximately what proportion of the Aspect Area is within the protected site?	1-10%
Does the area support important species?	Yes
Are there any significant threat species present in abundance? (Field visit required)	Yes (Alien crayfish have been recorded.)
What other features significantly influence the biodiversity in this area?	Streams Hedgerows Veteran Trees
Are any of these features in a very good condition? (Field visit required)	
Are any of these features in a poor condition? (Field visit required)	
What are the main land management activities taking place in the area? (Field visit required)	Cultivation Stock grazing Mowing
Do any of the above appear to have an appreciable positive impact on biodiversity? (Field visit required)	Some (Hay cutting on SSSI maintains its diversity.)
Do any of the above appear to have an appreciable negative impact on biodiversity? (Field visit required)	
Is the biodiversity in the area in any way threatened?	Not known
Are there clear opportunities to improve the biodiversity aspect of this area?	Yes (Where the hedges are not stockproof in their own right they would benefit by maintenance work and replanting of gaps)
Summarise the key features that define this area's biodiversity character	This area is made up of pasture and arable fields along the flat valley floor adjacent to the river Seven. The mixed pattered of grass and arable fields together with small ribbons of woodland which follow streams and the river itself give an important mosaic to the landscape which is enhanced by the occasional unimproved fields continuing interesting native species such as Gwaun Bryn Pasture SSSI. This mosaic is also important for a wide range of bat and bird species. Of great significance to this areas is the which runs from Llanymynech to Freestone Locks near Newtown. Montgomery Canal is of special interest because it supports aquatic, emergent and marginal plant communities of exceptional richness, including a large population of the internationally rare and threatened floating water plantain Luronium natans and a several other rare and scarce water plants. An important aquatic invertebrate assemblage is also present.
Evaluation	
Value	High (Although the area is mainly improved and arable land there are some very significant features in the area including the river Severn, and the Montgomery canal which is of special interest because it

	supports aquatic, emergent and marginal plant communities of exceptional richness, including a large population of the internationally rare and threatened floating water plantain Luronium natans and a several other rare and scarce water plants. There are also some traditional species rich hay meadows in the area. The existence of hedges and mixed land use all contribute to this areas richness and its High value.)
Condition	Good (the information and air photography suggests a good condition although a site visit would be needed to confirm this.)
Trend	Unassessed

Description

If yes, which habitats of international importance?	Lowland hay meadows
If yes, which BAP habitats?	Ancient and/or Species Rich Hedgerows Lowland Meadows Eutrophoic Standing Waters

Recommendations

Existing management	Generally Appropriate
Principal management recommendations	Where the hedges are not stockproof in their own right and would benefit by maintenance work and replanting of gaps
Guideline	Immediate (Manage and replant gaps in hedges) Medium Term (Manage a buffer zone alongside the river edge) Long Term (Replant woods especially alongside streams.)

Monitoring

Has the information ever been verified in the field?	No

Aspect Area Boundary

To what level was this information site-surveyed?	Level 3
At 1:10,000, how much of the Aspect Area boundary is precise?	All
What baseline information source was used for Aspect Area boundary mapping?	Aerial photographs
If OS Data was used, what was the scale?	1:10,000 and 1:25,000
What is the justification for the Aspect Area boundaries?	The boundary on the northwest side of the valley follow the break of slope to the south the boundary follows the larger meadows and arable fields with the smaller pastures of MONTLH056 following the rolling land to the east.

Bibliography

List the key sources used for this assessment	MWT Dolydd Hafren Bird Monitoring 2002 Odonata Records MWT Casual Records CCW Priority Invertebtrate Records Middletown Area Mammal Surveys CCW Montgomeryshire Potential SSSI Files CCW Montgomeryshire Potential SSSI Files CCW Montgomeryshire BAP Species Files MWT Casual Records Montgomery Canal Data MWT Llyn Coed-y-Dinas MWT Summer Bird Survey 2001 CCW Montgomeryshire Tir Gofal File Notes RSPB Records SSSI citations Wildlife trust reserve leaflets

Assessment

Additional Assessments	
Additional Comments	

Evaluation Matrix	
Evaluation Criteria: Priority Habitats	High (Although the area is mainly improved and arable land there are some very significant features in the area including the river Severn, and the Montgomery canal there are also some traditional species rich hay meadows in the area. The existence of hedges and mixed land use all contribute to this areas richness and its High value.)
Evaluation Criteria: Significance	High (Area contains small but extremely important example of certain habitats and a mosaic of land use.)
Evaluation Criteria: Opportunity	High (Replanting and managing hedges would significantly enhance the area.)
Evaluation Criteria: Expansion rates	Unassessed
Evaluation Criteria: Sensitivity	Unassessed
Evaluation Criteria: Connectivity/Cohesion	High (The are is tied together by the river and canal together with hedges where they exist.)
Evaluation Criteria: Habitat Evaluation	High (A number of significant habitats occur from traditional hay meadows to the Montgomery canal)
Evaluation Criteria: Importance for key species	High (Very large numbers of important species are recorded form the area.)
Evaluation Criteria: Overall Evaluation Habitat and Species	High (Although the area is mainly improved and arable land there are some very significant features in the area including the river Severn, and the Montgomery canal which is of special interest because it supports aquatic, emergent and marginal plant communities of exceptional richness, including a large population of the internationally rare and threatened floating water plantain Luronium natans and a several other rare and scarce water plants. There are also some traditional species rich hay meadows in the area. The existence of hedges and mixed land use all contribute to this areas richness and its High value.)
Description	
If yes, which species? (for each of the species, also note the source of information)	Skylark Alauda arvensis 2002 MWT Dolydd Hafren Bird Monitoring 2002 High Brown Fritillary Argynnis adippe 1987 Odonata Records Water Vole Arvicola terrestris 2000 MWT Casual Records White-Clawed Crayfish Austropotamobius pallipes 1988 CCW Priority Invertebtrate Records Brown Hare Lepus europaeus 2003 Middletown Area Mammal Surveys Bullfinch Pyrrhula pyrrhula 1997 CCW Montgomeryshire Potential SSSI Files Linnet Carduelis cannabina 2002 MWT Dolydd Hafren Bird Monitoring 2002 Prickly Sedge Carex muricata 1996 CCW Montgomeryshire Potential SSSI Files Reed Bunting Emberiza schoeniclus 2002 MWT Dolydd Hafren Bird Monitoring 2002 Red Hemp-Nettle Galeopsis angustifolia 1986 Ad hoc records Great Crested Newt Triturus cristatus 1999 CCW Montgomeryshire BAP Species Files Juniper Juniperus communis 1991 MWT Casual Records Red-Backed Shrike Lanius collurio 1985 RSPB Records Floating Water-Plantain Luronium natans 2001 Montgomery Canal Data Otter Lutra lutra 2004 CCW Licence Returns Data Common Scoter Melanitta nigra 2000 MWT Llyn Coed-y-Dinas Spotted Flycatcher Muscicapa striata 2001 MWT Summer Bird Survey 2001 Tree Sparrow Passer montanus

	2002 MWT Dolydd Hafren Bird Monitoring 2002 Common Fan-Foot Pechipogon strigilata 1987 MWT Casual Records Grey Partridge Perdix perdix 1996 Dolydd Hafren Monitoring 1996 Grass-Wrack Pondweed Potamogeton compressus 2001 Montgomery Canal Data Bullfinch Pyrrhula pyrrhula 2002 MWT Dolydd Hafren Bird Monitoring 2002 Lesser Horseshoe Bat Rhinolophus hipposideros 1998 CCW Montgomeryshire BAP Species Files Brown Trout Salmo trutta fario 2000 Ad hoc records Skylark Alauda arvensis 2003 CCW Montgomeryshire Tir Gofal File Notes Song Thrush Turdus philomelos 1997 CCW Montgomeryshire Potential SSSI Files Turtle Dove Streptopelia turtur 1982 MWT Casual Records Tree Sparrow Passer montanus 1997 CCW Montgomeryshire Potential SSSI Files Song Thrush Turdus philomelos 2002 MWT Dolydd Hafren Bird Monitoring 2002 Lapwing Vanellus vanellus 2002 MWT Dolydd Hafren Bi
Evaluation Matrix	
Justification of overall evaluation	Although the area is mainly improved and arable land there are some very significant features in the area including the river Severn, and the Montgomery canal which is of special interest because it supports aquatic, emergent and marginal plant communities of exceptional richness, including a large population of the internationally rare and threatened floating water plantain Luronium natans and a several other rare and scarce water plants. There are also some traditional species rich hay meadows in the area. The existence of hedges and mixed land use all contribute to this areas richness and its High value.
Recommendations	
Existing management remarks:	Area is grazed, cut for hay and silage and has arable farming.
Monitoring	
Date of monitoring?	2016-01-15
Monitoring undertaken by	Stages 1, 2 and 3 change detection, field verification and amendment completed by Environment Systems in conjunction with the local planning authority. Quality Assurance completed by TACP.
Has this record has been updated following monitoring work?	

Visual and Sensory

Visual and Sensory		
Aspect Area Name	**River Severn Flood plain**	Crown Copyright. All rights reserved CCW 100018813 2005
Aspect Area Classification	**Lowland/Flat Lowland/Levels/Flat Open Lowland Farmland (Level 3)**	
Aspect Area Code	**MNTGMVS650**	
Date Of Survey : 09/02/2004		

Description	
Physical Form And Elements: Topographic Form?	Levels
Physical Form And Elements: Landcover Pattern?	Field Pattern/Mosaic
Aesthetic Qualities: Scale?	Vast
Aesthetic Qualities: Sense of Enclosure?	Open
Aesthetic Qualities: Diversity?	Diverse
Aesthetic Qualities: Texture?	Medium
Aesthetic Qualities: Lines?	Angular
Aesthetic Qualities: Colour?	Moderate Contrasts
Aesthetic Qualities: Balance?	Balanced
Aesthetic Qualities: Unity?	Neutral
Aesthetic Qualities: Pattern?	Organised
Aesthetic Qualities: Seasonal Interest?	Mixed
Other Factors: Level of Human Access?	Constant
Other Factors: Night Time Light Pollution?	Substantial (Significant urban areas situated at Newtown and Welshpool and the partially lit A483(T) together with regular smaller scale settlements and farmsteads that line the valley bottom and follow the A483(T) such as Garthmyl, Berriew and Four Crosses)
Other Factors: Use of Construction Materials?	Generally Appropriate
What materials? Give Details:	N/A
There are attractive views...	...both in and out (To and from adjacent higher ground of wooded / mosaic farmland and hill slopes...To the north of the aspect particularly dramatic views are gained to Breidden Hill and Forest... Views into the aspect encompass the scale of the mosaic farmland and provides an attractive setting with the River Severn winding through the valley bottom)
There are detractive views...	...within (On outskirts of settlements / industrial estates)
Perceptual and Other Sensory Qualities	Attractive (Rolling farmland in a valley setting) Tranquil (Adjacent to River Severn and Montgomeryshire Canal) Noisy (In close proximity to urban areas) Settled
What is the sense of place/local distinctiveness	Strong (The main river valley that distinguishes the lowland eastern extent of the study area from the upland dominating the western extents)
Evaluation	
Value:	Moderate (Smaller areas within the aspect as a whole displays some and outstanding qualities however this is lessened by the association with urban areas and a heavily used road corridor)
Condition:	Unassessed
Trend:	Unassessed
Recommendations	
Define the key qualities that should be conserved:	Balance between arable and dairy farming producing a diverse pattern of land use
Define the key qualities that should be enhanced:	Field boundaries to maintain and enhance balance between open grazed / cultivated land and wooded areas
Define the key qualities that should be changed:	N/A

Define the key elements that should be conserved:	Hedgerow boundaries
Define the key elements that should be enhanced:	N/A
Define the key elements that should be changed:	N/A
Principal management recommendation:	Maintain as existing
Tolerance To Change	
Are there any significant threats to the current integrity and condition of the visual & sensory features of the area?	Not known
Aspect Area Boundary	
To what level was this information site-surveyed?	Level 3
At 1:10,000, how much of the Aspect Area boundary is precise?	All
What baseline information source was used for Aspect Area boundary mapping?	Other (OS Landline and Aerial Photographs)
If OS Data was used, what was the scale?	1:10,000 and 1:25,000
What is the justification for the Aspect Area boundaries?	Predominant land use and topography
Bibliography	
List the key sources used for this assessment	Montgomeryshire Landscape Assessment (1992)
Assessment	
Additional Assessments	N/A
Additional Comments	N/A
Evaluation Matrix	
Evaluation Criteria: Overall Evaluation	Moderate (N/A)
Justification of overall evaluation	Smaller areas within the aspect as a whole displays some and outstanding qualities however this is lessened by the association with urban areas and a heavily used road corridor = Moderate
Evaluation Criteria: Scenic quality	Moderate (Generally high quality views but lessened by the association with urban areas and a heavily used road corridor)
Evaluation Criteria: Integrity	Moderate (Some degradation of the overall character adjacent to urban areas)
Evaluation Criteria: Character	High (N/A)
Evaluation Criteria: Rarity	High (N/A)
Description	
Summary Description	A significant open valley / vale with a patchwork of medium to large field parcels many displaying established field boundaries of managed and overgrown hedgerows with numerous hedgerow trees. Predominantly arable farming with some lowland dairy farming. Settlements of varying sizes are prevalent from farmsteads to significant urban areas such as Welshpool and Newtown. Open skies dominate with wooded valley sides fringing the valley bottom.
Physical form and elements: Settlement pattern	Mixture
Physical form and elements: Boundary type	Mixture
Recommendations	
Guideline	Long Term (Avoid amalgamation of smaller fields where possible) Long Term (Implement design guidance for industrial development)
Existing management	Generally Appropriate

Existing management remarks:	Mixture of arable and dairy farming maintaining a network of medium to large field parcels that have well managed hedgerow boundaries
Monitoring	
Has the information ever been verified in the field?	Yes (N/A)
Does this area have a special or functional link with an adjacent area?	Yes (Newtown and Welshpool and the valley sides comprising hill and scarp slopes to the east and west of the valley bottom)
During which season(s) was fieldwork carried out?	Summer
Date of monitoring?	2015-01-29
Monitoring undertaken by	Stages 1, 2 and 3 change detection, field verification and amendment completed by Simon White of White Consultants in conjunction with the local planning authority.
Has this record has been updated following monitoring work?	This record has been updated following monitoring work, there was a real change in the aspect area (Boundary change to accommodate settlement/development expansion at Abermule which justifies a separate area. Also expansion at Welshpool *(commercial development), Llanfyllin, Four Crosses and Guilsfield.)
Change indicated by	OS Data, Aerial Photographs Fieldwork
What has changed?	

Historic Landscape

Historic Landscape		
Aspect Area Name	**Arddleen**	Crown Copyright. All rights reserved CCW 100018813 2005
Aspect Area Classification	**Rural environment/Agricultural/Regular Fieldscapes (Level 3)**	
Aspect Area Code	**MNTGMHL501**	
Date Of Survey : 27/03/2006		

Description	
If working at level 3, the classification describes the dominant historic pattern, but which other patterns are important to the historical pattern of this area? (Tick all that apply)	Nucleated Settlement Communications
Monitoring	
Has the information ever been verified in the field?	No
Does this area have a special or functional link with an adjacent area?	
Description	
Which traditional boundary types prevail in the area? (Tick all that apply)	Hedgerow Hedgerow With Trees Hedgebank Post & Wire Fence
What is the nature of any significant archaeological interest in the area? (Tick all that apply)	Buried-dry Relict-Earthworks Relict-Stone Monuments

	Buildings & Structures Documentary
Which chronological period is dominant in the area?	Post Medieval (1536+) Prehistoric Medieval (to 1536)
Has a Historic Landscape Characterisation been undertaken here?	No
Are there SMR sites here?	Yes
Are there SAMs here?	Yes
Are there Listed Buildings here?	Yes
Are there Registered Historic Parks and Gardens here?	No
Are there Conservation Areas here?	No
Are there World Heritage Sites here?	No
Is the area within a Registered Landscape of Historic Interest?	No
Aspect Area Boundary	
To what level was this information site-surveyed?	Level 3
At 1:10,000, how much of the Aspect Area boundary is precise?	All
What baseline information source was used for Aspect Area boundary mapping?	OS Raster
If OS Data was used, what was the scale?	1:10,000
What is the justification for the Aspect Area boundaries?	Defined with reference to topography and field pattern...
Bibliography	
List the key sources used for this assessment	See general bibliography in Technical Report, and sources quoted in Regional Historic Environment Record...
Assessment	
Additional Assessments	
Additional Comments	
Evaluation Matrix	
Evaluation Criteria: Overall Evaluation	Outstanding (See overall justification.)
Justification of overall evaluation	Straggling area of regular fields occupying flat land above the Severn floodplain. The area contains significant remains of ridge and furrow field systems associated with medieval and later farms and farmsteads all of which overlie significant areas of earlier and later prehistoric settlements and burial monuments and is overlain by canal archaeology and a Turnpike road. Its complexity contributes to its high scores.
Evaluation	
Condition:	
Value:	Outstanding
Trend:	
Recommendations	
Existing management	
Existing management remarks:	
Principal management recommendations	
Guideline	
Description	
Summary Description / Key Patterns and Elements	Regular, straight-sided, lowland fieldscapes on the western side of the floodplain of the Severn valley in

	the Four Crosses and Llandrinio areas, north of Pool Quay. The distinctive field patterns in this area appear to represent enclosure in the late 18th and 19th centuries of lowland commons and medieval open fields, the latter represented by areas of ridge and furrow cultivation. Early settlement and land use indicated by complexes of Neolithic to Bronze Age burial and ritual monuments in the Four Crosses area and by possibly later prehistoric pit alignments and enclosed farmsteads. The early medieval Offa''s Dyke crosses the area. Dispersed farmsteads and houses of medieval and post-medieval origin. Small nucleated church settlements of early medieval origin at Llantysilio and Llandrinio, with small nucleated settlement of medieval origin at Arddleen. The present-day nucleated settlements at Four Crosses and Arddleen originated in the 18th century onwards from their position on the road, railway and canal networks. The late 18th-century Montgomeryshire Canal and the dismantled later 19th-century Cambrian Railway line between Oswestry and Buttington run through the area.
If Classification is "Other", specify here	

Evaluation Matrix

Evaluation Criteria: Integrity	High (See overall justification.)
Evaluation Criteria: Potential	Outstanding (Significant buried archaeology)
Evaluation Criteria: Rarity	Outstanding (Complex multi-layered landscape)
Evaluation Criteria: Survival	N/A (See overall justification.)
Evaluation Criteria: Condition	

Cultural Landscape

Cultural Landscape		
Aspect Area Name	**Rural Landscapes**	Crown Copyright. All rights reserved CCW 100018813 2005
Aspect Area Classification	**Influences/Material expressions/Rural/Other Rural (specify) (Level 4)**	
Aspect Area Code	**MNTGMCL051**	
Date Of Survey : 29/10/2005		

Monitoring

Has the information ever been verified in the field?	Yes (Partly, through observation on site visits and on maps at 1;25000)
Does this area have a special or functional link with an adjacent area?	Yes (The entire Study Area)

Description

The classification at level 3 describes the dominant cultural context, but which other contexts are important to the cultural landscape of this area?	Rural Other (''Other rural'' is chosen at Level 4 to reflect the richness and diversity of the cultural and aesthetic qualities of the landscape outside other designated Aspect Areas)
Which level 4 classes are particularly significant to the cultural landscape character of this area - Influences?	Agricultural Forestry Fishing/ hunting Rural Settlement Communications & Transport

To what extent do the context and level 4 details selected contribute to the cultural identity, local distinctiveness or sense of place of the area?	Strong (Level 4 details combine to reinforce the cultural essence of this multi-part landscape)
To what extent is the cultural information widely recognised or appreciated?	Regionally (Mostly to those who live there and to the poeple of Wales)
Are there any artistic expressions that are particularly famous or associated with the Aspect Area?	Not known
Are there any people / movements / institutions that are particularly famous or associated with the Aspect Area?	Not known
Is there any folklore or are there legends that are particularly famous or associated with the Aspect Area?	Not known
Are there any events/traditions that are particularly famous or associated with the Aspect Area?	Not known
Are there any technical / scientific discoveries that are particularly famous or associated with the Aspect Area?	No
What are the attributes of the cultural elements in the Aspect Area?	Mixed
What chronological periods are culturally dominant in the area?	Post 1950 Inter War Victorian & Edwardian Georgian Late Medieval Medieval Early Christian Roman Pre-Roman
Are there certain place-names in the area that are particularly significant?	No
Summary Description: (no more than 150 words)	The Aspect Area is essentially a catch-all of landscapes surrounding other Aspect Areas. It reveals an eclectic mix of landscape type, from fertile lowlands to bleak moorlands, and forms a buffer between oither Aspect Areas that are more culturally distinctive or diverse. Surprisingly, there are few statutorily protected landscape types - such as SSSIs or SLAs within the area. Nevertheless, Rural Landscapes forms the background to the more detailed painting on the canvas of Montgomeryshire, contributing greatly to the county''s soubriquet of Powis paradwys Cymru.

Tolerance To Change

Are there any significant threats to the current integrity and condition of the Cultural Landscape features of the area?	Yes (Decline in agricultural economy, rural depopulation)

Description

If yes, give examples of the place-names and their significance	Powys Paradwys Cymru - the ancient name for Gwenwynwyn, the territory that is now Montgomeryshire

Aspect Area Boundary

To what level was this information site-surveyed?	Level 3
At 1:10,000, how much of the Aspect Area boundary is precise?	Some (Boundaries are formed by (a) the Study Area boundary; and (b) the boundaries of other Aspect Areas)
What baseline information source was used for Aspect Area boundary mapping?	OS Raster
If OS Data was used, what was the scale?	1:25,000

What is the justification for the Aspect Area boundaries?	Boundaries are formed by (a) the Study Area boundary; and (b) the boundaries of other Aspect Areas

Bibliography

List the key sources used for this assessment	In the Heart of Powysland, Robert Owen; Welshpool, 1930

Assessment

Additional Assessments	none
Additional Comments	none

Evaluation Matrix

Evaluation Criteria: Overall Evaluation	High (High as a varied, visually rich rural landscape of a wide topographical range that provides the framework for the Study Area as a whole)
Justification of overall evaluation	See Q40
Evaluation Criteria: Recognition/transparency	Sub-regional recognition (Rural Mongomeryshire is well known for the attractiveness of its landscapes)
Evaluation Criteria: Period	Very apparent (High as an essentially evolved agricultural landscape)
Evaluation Criteria: Rarity (Culture)	Commonplace (These rural areas share many of the characteristics and cultural essence with large tracts of Wales)
Evaluation Criteria: Documentation	Unassessed
Evaluation Criteria: Group Value	Considerable (Rural Mongomeryshire is well known for the attractiveness of its landscapes)
Evaluation Criteria: Survival	N/A (Rural landscapes survive as evolved examples of human exploitation and occupation)
Evaluation Criteria: Vulnerability	Tolerant (Vulnerable to agricultural decline and consequent land husbandry, and depopulation)
Evaluation Criteria: Diversity	Highly complex (Elements within the Aspect Area display a hugely rich diversity from barren moorland to fertile valleys. Small isolated farmsteads on valley sides add much to the attractiveness of the landscape and their maintenance should be assisted)
Evaluation Criteria: Potential (Culture)	Considerable (High - in the sense that there is high potential for further deterioration)

Description

Which level 4 classes are particularly significant to the cultural landscape character of this area - Associations?	Places & Place Names Sense of Place

Evaluation

Condition:	Fair (The rural landscape is generally well maintained, but suffers from its inability to sustain a vibrant agricultural economy - leading to rural depopulation, diversity and hence neglect)
Value:	High (High as topographically and scenically varied and distinctive, comprising bare upland moorland

	and fertile valleys, the latter containing a variety of field patterns)
Trend:	Declining (Declining through unsustainable economics of agriculture, rural depopulation and neglect)
Recommendations	
Existing management:	Generally Appropriate
Existing management remarks:	As a largely agricultural landscape - and therefore economically important - landscape management is appropriate within the prevailing circumstances of farming economy
Principal management recommendations	Encourage through grants or subsidy the proper management and maintenance of farming landscapes to replace the centurires-old husbandry that made these rural areas what they are today
Guideline	Immediate (Seek more imaginative means of keeping young people closer to the land and their roots by encouraging regenerative or small business activity in this age of the world wide web and e-commerce) Medium Term (Seek to ensure sustainability of income and provide subsidy to retain people so that they may nurture the landscape) Long Term (Provide grants and/or subsidies for the maintenance of structures in the landscape)
Description	
If Classification is "Other", specify here	

7.3.4 Landscape Designations

The application site at Domgay Hall does not occupy any areas of national landscape designation. However, some parts of the study area are subject to designation at the local level.

Conservation Areas

The village of Four Crosses is not in a conservation area. The closest conservation area to the site within 5km is Llanymynech.

7.3.5 Relevant General Policy

National Planning Policy

7.4 Planning Policy Wales (Edition 12, February 2024) – Chapter 5 Productive and Enterprising Places

The Welsh Assembly Government states that:

For planning purposes the Welsh Government defines economic development as the development of land and buildings for activities that generate sustainable long term prosperity, jobs and incomes. The

planning system should ensure that the growth of output and employment in Wales as a whole is not constrained by a shortage of land for economic uses.

Economic land uses include the traditional employment land uses (offices, research and development, industry and warehousing), as well as uses such as retail, tourism, and public services. Economic land uses also include construction, energy, minerals, waste and telecommunications sectors which are also sensitive to planning policy. The Welsh Government seeks to maximise opportunities to strengthen the foundational economy, particularly the food, retail, tourism and care sectors which play such a prominent role throughout Wales; the planning system should be supportive of this aim. Similarly, growth in innovative, emerging technology and high value added sectors such as advanced engineering, renewable and low carbon energy, digital and bio-technology sectors are also strongly supported. Development plans should consider the role these sectors may play in terms of investment and job creation in their area. This section focuses primarily on traditional employment land uses (B1, B2 and B8) while policies on other economic sectors are found elsewhere in this chapter and other parts of PPW.

Planning authorities should adopt a positive approach to diversification projects in rural areas. Additional small business activities can often be sustainably located on farms and provide additional income streams. Diversification can strengthen the rural economy and bring additional employment and prosperity to communities.

Local Planning Policy

The Plan does include various references to agriculture and the agricultural economy of Powys. The section quoted at SP6 and its RJ in para 3.3.35 links to national policy, whilst para 4.1.5 confirms that no specific policy is included for agricultural development. Agricultural buildings will be just one type of new development and will be assessed against all the relevant plan policies (design and resources, landscape, environment etc) alongside national planning policy guidance.

7.5 Project Description and Mitigation Measures

This section should be read in conjunction with the full description of the development in Chapter 4 of this ES. It summarises how the main aspects of the development may affect the landscape and visual amenity of the area, and describes the mitigation measures which have been incorporated through the iterative design of the development in order to prevent, reduce or offset potentially adverse landscape and visual impacts.

Construction

During the construction phase there would be a number of effects on the landscape resource and visual amenity. The ground would be levelled and the new development constructed. A number of vehicles would be used during this phase, including excavators, dump trucks and haulage lorries. All elements of the proposed poultry installation facility would be constructed during this phase. The overall duration of the construction phase is anticipated to last six months in 2024.

Completed Development

The full details of the completed poultry installation are contained in the project description chapter of this ES (Chapter 4 – Development Description) and Design and Access Statement (included as part of the planning submission). The poultry installation comprises two main bird houses and six feed bins.

The design of the poultry houses are a simple standard design most commonly used for such buildings, they have a low profile which aids heat control and ventilation; the height of the buildings is 5.17m to ridge, the height of the feed bins will be 8 metres.

In addition to the development within the site itself, an integral part of the proposal is the improved existing access road and improvements to the highway.

Incorporated Mitigation

A number of measures would be incorporated into the development to reduce and minimise the potential effect on landscape character and visual amenity. These measures have been developed with reference to local landscape character and the criteria set out in Powys Local Development Plan. Full detail is provided at Chapter 4.

The site selection process sets out to ensure that a suitable site was identified. This included consideration of setting and context to ensure that the final solution was as appropriate as possible to the end use.

Design Consultants have been involved from the beginning of formulation of development proposals for the site. The proposed solution, set out in the Development Description (Chapter 4) and the Design and Access Statement has been design to create as minimal an impact on the local area as possible. The design of the buildings has been led by their functionality and the requirement to create little adverse impact on the surrounding area. The building heights are as low as practically possible.

A sympathetic selection of materials is included in the development to complement the surrounding landscape; reflective materials and bright colours have been avoided wherever possible.

Lighting of the site is required during working hours in winter months and during bird catching. During bird catching lighting is kept as low as practically possible. Appropriate cowls / shielding of lights would be instigated, the light spread would be minimised through use of directional lighting and hours of lighting would be kept to a minimum to reduce disturbance.

Follow Up

The effectiveness of the landscape scheme will be assessed on an annual basis; the landscape plan will be adhered to, to ensure that all trees that die within five years of planting will be replaced etc. Local interest groups will be invited to monitor the landscape scheme and the overall effect on the landscape character.

7.6 Assessment of Residual Landscape and Visual Effects

This section identifies the potential impacts on the landscape resource and visual amenity of the study area. It is subdivided into the following sections:

- Assessment of impacts on the landscape resource; and
- Assessment of visual impacts.

7.6.1 Assessment of Direct Impacts on the Landscape Resource

The site currently comprises arable land and modern farm buildings. It is anticipated that the poultry development at Domgay Hall will not result in the loss of any important landscape features as a consequence of the development. However, it is acknowledged that there would be a change in land cover of the site as a result of the development. The overall sensitivity of the site to direct changes resulting from new development is low.

While the proposals would lead to the development of the majority of the site, it also incorporates proposals to plant the areas surrounding the poultry development with native species. This will provide opportunities to enhance its biodiversity potential, making a positive contribution.

The magnitude of change associated with the potential direct impacts resulting from the development of the site would be slight, resulting in a minor impact on the landscape resource. Therefore, it is anticipated that the direct effects on the landscape associated with the development of the poultry development itself would not be significant.

7.6.2 Landscape Character

As described above, the development would have an impact on the character of the application site itself. However, the impacts on the defining characteristics of the character type within which the site is located and also to each of the adjacent character types would be more variable. Effects on landscape character will be experienced differently in the various landscape character types affected. This will be due to factors such as landform, distance and relative elevation, combined with the context of established landscape features and the degree to which the new elements are perceived to have been added.

The following sections describe the potential impacts on the perception of the landscape character type.

Geological Landscape

Includes the broad platform dominated by fluvioglacial sheet deposits with some minor glaciolacustrine deposits in the Four Crosses area on the western side of the Severn valley; the fill of the wide valley in the Sarnau area, which links the Severn and Vyrnwy valleys and the SE apron of the Vyrnwy valley which is also dominated by fluvioglacial sheet deposits, etc. Gentle surface undulations typical and marshy areas. Also includes similar areas SE to Guilsfield and a broad cwm-like area of infill. Gaer bank in the Sarnau valley is probably a low mound of bedrock Ordovician deposits.

Landscape Habitat

This area is made up of pasture and arable fields along the flat valley floor adjacent to the river Seven. The mixed pattered of grass and arable fields together with small ribbons of woodland which follow streams and the river itself give an important mosaic to the landscape which is enhanced by the occasional unimproved fields continuing interesting native species such as Gwaun Bryn Pasture SSSI. This mosaic is also important for a wide range of bat and bird species. Of great significance to this areas is the which runs from Llanymynech to Freestone Locks near Newtown. Montgomery Canal is of special interest because it supports aquatic, emergent and marginal plant communities of exceptional richness, including a large population of the internationally rare and threatened floating water plantain Luronium natans and a several other rare and scarce water plants. An important aquatic invertebrate assemblage is also present.

Visual and Sensory

A significant open valley / vale with a patchwork of medium to large field parcels many displaying established field boundaries of managed and overgrown hedgerows with numerous hedgerow trees. Predominantly arable farming with some lowland dairy farming. Settlements of varying sizes are prevalent from farmsteads to significant urban areas such as Welshpool and Newtown. Open skies dominate with wooded valley sides fringing the valley bottom.

Historic Landscape

Regular, straight-sided, lowland fieldscapes on the western side of the floodplain of the Severn valley in the Four Crosses and Llandrinio areas, north of Pool Quay. The distinctive field patterns in this area appear to represent enclosure in the late 18th and 19th centuries of lowland commons and medieval open fields, the latter represented by areas of ridge and furrow cultivation. Early settlement and land use indicated by complexes of Neolithic to Bronze Age burial and ritual monuments in the Four Crosses area and by possibly later prehistoric pit alignments and enclosed farmsteads. The early medieval Offa''s Dyke crosses the area. Dispersed farmsteads and houses of medieval and post-medieval origin. Small nucleated church settlements of early medieval origin at Llantysilio and Llandrinio, with small nucleated settlement of medieval origin at Arddleen. The present-day nucleated settlements at Four Crosses and Arddleen originated in the 18th century onwards from their position on the road, railway and canal networks. The late 18th-century Montgomeryshire Canal and the dismantled later 19th-century Cambrian Railway line between Oswestry and Buttington run through the area.

Cultural Landscape

The Aspect Area is essentially a catch-all of landscapes surrounding other Aspect Areas. It reveals an eclectic mix of landscape type, from fertile lowlands to bleak moorlands, and forms a buffer between oither Aspect Areas that are more culturally distinctive or diverse. Surprisingly, there are few statutorily protected landscape types - such as SSSIs or SLAs within the area. Nevertheless, Rural Landscapes forms the background to the more detailed painting on the canvas of Montgomeryshire, contributing greatly to the county"s soubriquet of Powis paradwys Cymru.

7.6.3 Relationship of the Development with Landscape Planning Policies and Designated Landscapes

General Landscape Planning Policy Objectives

It is clear that local planning policy is not supportive of development that would have adverse impacts on landscape character and visual amenity. It is also clear that any large scale agricultural development proposals present challenges for integrating such development with any given context. Whatever technological solution or site is selected this type of development is difficult to integrate with a relatively rural county like Powys. The proposals have been developed to provide a solution that meets with policies of rural economic sustainability while minimising the potential for adverse impacts on landscape character and visual amenity.

The site selection has been carefully considered to minimise adverse impacts. It comprises a site adjoining an existing farm complex. However, it is acknowledged that some sensitive receptors, including residential properties and public footpaths are located at relatively close range. The nature of the surrounding landscape, i.e. the screen effect provided by woodland, hedgerows and hedgerow trees helps to reduce the potential visibility of the proposed development.

Design consultants have been involved in the preparation of proposals for the site from an early stage to ensure that certain design principles have been considered from the outset. This has ensured that the architectural solution for the proposals respects character and context as best it can. The design of the buildings and layout of the site fits into the surrounding landscape. The proposals for the site incorporate the planting of native species in a landscape strategy that will provide opportunities to improve biodiversity and reintroduce lost features and provide a suitable setting for the development.

7.7 Assessment of Potential Visual Impacts

7.7.1 Visibility Analysis

Overview

Careful observations have been made during the fieldwork undertaken during the course of the assessment to understand the potential visibility of the proposed development.

It is anticipated that the potential visibility of the development throughout the study area would be variable. The study area is a rolling landscape with valley bottoms and sandstone escarpments meaning that in most instances intervening landscape features obscure the view unless at close proximity to the site. The woodland plantations, hedgerows and hedgerow trees combine to reduce visibility close at hand.

At locations in close proximity to the site, the development would be clearly seen through intervening bunding and vegetation. However as the separation distances between the viewer and the site increases the screening effect of intervening landform, buildings and vegetation has a greater effect.

Settlements

Four Crosses
Four Crosses will be separated from the development by intervening land form and existing vegetation.

Llandysilio
The site is not visible from Llandysilio due to the intervening landform and distance from the site.

Llanymynech
The development is not visible from the village due to the distance and existing vegetation and land form.

Dispersed Residential Properties
It is acknowledged that a number of dispersed residential properties and farmsteads are located throughout the area surrounding the site. The site or development will not be visible to any other properties other than those described above for similar reasons as described under each of the headings above.

Primary Roads and Railways

Fleeting views of the site through intermittent field gateways are available along the council maintained road. When the landscaping plans are fully completed the views of the sheds will be obscured by the vegetation and land form.

Public Rights of Way

Footpaths are used by both visitors and local residents. They provide opportunities to appreciate the landscape and the distances travelled on long distance routes can allow the transition between different landscape areas to be experienced. There are also several public rights of way which cross the countryside study area, from which there would be potential views of the proposed development.

There is a local footpath close to the site that will have views towards the site to a varying extent.
The footpath that runs through the proposed site will be diverted should planning consent be granted.

Viewpoint Assessment

The viewpoint assessment has been carried out to identify and evaluate the potential impacts on visual amenity arising from the poultry installation at specific representative locations in the study area. Important landscape features which lie outside the study area have also been considered in viewpoint selection. The location of viewpoints was determined as part of the desk survey and informed by the consultation process. The types of receptors considered included the following:

- Settlements (towns and villages, as well as smaller groups of residential properties);
- Roads (main and minor);
- Public Rights of Way; and
- National Landscape Designations;

Having identified key sensitive receptors in the study area, those likely to be affected by the development were derived through the study of Ordnance Survey mapping information. In order to confirm the appropriateness of the viewpoint selection, field survey verification was carried out. This involved checking the viewpoint locations on the ground, to ensure that there would be views of the poultry installation.

Following field verification of potential viewpoints, the viewpoint selection for the impact assessment was finalised. The final viewpoint selection includes five viewpoints which represent views from a range of representative landscape and visual receptors, distances from the development, altitudes and directions, with the aim of achieving an even distribution at compass points around the site. These viewpoint locations are illustrated on Appendix 12. Table 20 presents a summary of the viewpoint assessment.

For the purposes of assessing the effects on visual amenity the sensitivity of the receptors is as defined within the method of assessment. Visual receptor sensitivity to change is defined as being high, medium, low or negligible depending upon the activity of the receptor. It should also be noted that the assessment of potential effects at any viewpoint cannot be extended to conclude the same effects on the whole of the landscape character type within which the viewpoint occurs.

Table 20 – Key Receptors

View point	Name	Easting	Northing	Distance from development to residential curtilage / footpath (m)	Key Receptors
1	Domgay Lane	327987	319201	156	Road Users / Walkers
2	Footpath	327630	319273	174	Walkers
3	A483	326872	319317	935	Road Users
4	Bridlepath	327816	319924	641	Walkers
5	B4398	327791	320738	1451	Road Users

Table 21: Summary of Impacts on Visual Amenity

	Viewpoint	Sensitivity	Magnitude of Change in short term	Magnitude of change after planting established	Impact on visual amenity in the short term	Impact on visual amenity after 5 years
1	Domgay Lane	Low	Negligible	None	Negligible	None
2	Footpath	Low	Slight	Negligible	Slight	Negligible
3	A483	Low	Slight	Negligible	Slight	Negligible
4	Bridlepath	Low	Slight	Negligible	Slight	Negligible
5	B4398	Low	Negligible	Negligible	Slight	Negligible

7.8 Night Time Lighting

The potential for the development to have an adverse effect on landscape character and visual amenity has been highlighted in this chapter. The nature of the poultry installation means that some light sources will be required to allow safe and effective activities within the site to take place. The assessment has identified that the site is located within a relatively dark, rural context with limited existing sources of light. However, the site is located in an intensively farmed area and as such field operations and other activities take place during hours of darkness and use intense lighting for visibility (rather than security purposes).

New light sources are required during working hours in winter months to ensure safety within the site, lighting would also be required during bird catching some of which takes place during hours of low light intensity. It is anticipated that these proposals for the development of the site would add to this baseline situation. However, it is anticipated that the potential impact associated with this aspect of the development will be minimal as there will not be round the clock security lighting and the area of lighting (the front gable ends of the buildings) is directed away from the main residential areas, this will respect the rural context of the site. Added to this the lighting is directed downwards to reduce light escaping from the site plus each light is protected with a cowl to avoid the lights lighting any areas outside of the site. The lighting will have a minor effect on the visual amenity of local residents and would therefore not be significant.

7.9 Potential Cumulative Effects

The development would add to existing agricultural developments in the locality.

7.10 Conclusions

This chapter of the ES has examined the potential impacts of the development on the landscape and visual amenity of the study area. It has considered the potential direct impacts on the fabric of the landscape and the potential impacts on the perception of landscape character. The assessment has also considered the potential impacts of the development on visual amenity.

The study area was defined as extending to a 2km radius centred on the site location. Within this area, both landscape and visual receptors were identified and recorded, in effect forming the baseline situation into which the poultry installation has been introduced and have the potential to affect. Planning policies relevant to the Landscape and Visual Assessment have also been considered. The assessment considered both the possible effects during the construction phase and the residual effects during the operational phase of the development after mitigation measures have been incorporated. The visual assessment was carried out in context of the site in the first year of operation and the site following the establishment of the landscape scheme.

7.10.1 Existing Situation

The direct effects on the fabric of the landscape will be limited. The proposed development will occupy intensively farmed pasture land. No important landscape features or elements will be lost as a direct consequence of the development. As the site lies on an established agricultural development, the proposed development will be compatible with the surrounding land uses.

7.10.2 Impacts on Visual Amenity

In the short term there would have been some moderate effects on visual amenity as a result of the development, as is inevitable with a development of this scale. However, as with the potential effect on landscape character, these will be mitigated by the setting of the site and proposed landscaping. The viewpoint analysis identifies that at some of the locations close to the site there will be some effect on visual amenity as a result of this development, the worst affected are public footpaths that in any case are used irregularly as they are of limited value, the footpaths are clearly historical remnants of practical access routes for residents of the area rather than for enjoyment of the countryside. The incorporated mitigation measures will in the longer/medium term reduce some of the effects and indeed will have some beneficial effects on the landscape as historic landscape features will be restored. The viewpoint analysis shows that at the other locations examined in the analysis there will not be a significant effect on visual amenity as a result of the poultry installation. This is largely attributed to a combination of increasing separation distance, the influence of intervening vegetation and the surrounding agricultural context (large scale agricultural development) that the poultry installation will be seen in the context of.

7.10.3 Conclusion

Overall, the landscape and visual assessment has established that the poultry installation will have a limited effect on the baseline conditions in terms of both landscape character and visual amenity. The measures factored into the site selection and design process will reduce, minimise and even improve any potential adverse effects. Therefore, on balance it is considered that the development would be acceptable in this context with regard to the potential effects on landscape character and visual amenity.

CHAPTER 8 – TRAFFIC

8. Traffic

This Chapter considers the development against National, Regional and Local Policy, and compares existing and future traffic generation and the impact on the local road network. A net reduction in vehicle movements is proposed in many villages across the locality, following this a positive benefit for existing and future users of the road network regarding safety will be realised. No significant effects on pedestrians, cyclists, horse riders or public transport are envisaged.

8.1 Introduction

This chapter of the Environmental Statement (ES) examines the environmental impacts of the poultry installation in relation to traffic and transport and importantly the effect of traffic on local amenity. The assessment considers the potential impacts on traffic and transportation associated with the poultry installation principally during operation.

8.1.1 Scope of the Assessment

The key issue is not so much whether the local road networks can accommodate the traffic associated with the site (as the increases proposed would be less than 1% of the total traffic on the local road networks), but the effect on local amenity. As such, this assessment focuses on the traffic implication on individual villages affected by the proposal.

This assessment includes the following principal assessments:

- Baseline traffic assessment
- Trip generation and assignment (for bird / feed deliveries, manure / bird removals etc);
- Assessment of traffic impact;
- A routeing plan for the proposals.

Where appropriate, construction traffic has been covered within this ES chapter.

The assessment of other environmental effects associated with road traffic such noise can be found elsewhere in the ES at Chapter 11 – Noise and Vibration.

8.1.2 The Development

The proposed poultry buildings are expected to be operational in 2024. Hours of operation will be 24 hours seven days a week. A proportion of movements of birds from the site take place between the recognised night time hours of 2300 and 0700 due to factory operating times and bird welfare standards. This assessment assesses night time movements to give a full assessment of the impact of future traffic generation.

The proposed development is to extend the site with two new poultry buildings. The bird numbers will increase on site by 40,000 birds. However some of the birds that are housed in the existing buildings will move to the proposed poultry houses in order for the stocking rate to reduce to 30kg/m^2.

There are a maximum of around 7 bird removal HGVs (14 movements in and out) travelling to and from the poultry installation during bird removals in one 24 hour period and a maximum of two movements per hour. Part time employment attributed to the development is carried out by existing staff in the employment of Mr Evans and will therefore generate no increase in movements on the baseline.

8.1.3 Site Access

The site is accessed off the A483 between Llanymynech and Four Crosses. The site is accessed off Domgay Lane, from the improved existing access as per the site and location plans.

8.2 Legislation, Planning Policy and Other Guidance

Relevant planning and transport policy is contained in a number of documents ranging from Planning Policy Guidance Notes; Government White Papers and Regional Spatial Strategies; to the detailed policies of the Local Development Plan and other supplementary documents. More detail on transport planning policy is provided in the Traffic Assessment.

8.2.1 White Papers and Statutes

Policies specific to the Transport Assessment are contained within the Government White Paper "A New Deal for Transport" (July 1998). This document emphasises the need to reverse the dispersal of development, improve access to jobs and services, reduce the need to travel and reduce the reliance upon the use of private cars.

The Road Traffic Reduction Act 1997 requires local authorities to assess traffic levels and forecast growth of traffic levels in their areas.

8.2.2 Planning Policy

National Policy

Current Transport Policies encourage the use of sustainable modes of transport, such as public transport, cycling and walking, in response to growing concerns with regard to environmental issues and problems associated with the need to reduce traffic and manage congestion. The transport system moves goods and people and helps to make the economy tick. Good transport is needed to get people to work and many jobs are based on extensive travel.

Transport is also a major contributor to the economy in its own right, currently employing around 1.7 million people. We rely on efficient transport to ensure that goods and services are distributed throughout the UK and overseas.

The principles contained in the White Paper are reinforced in Technical Advice Note 18: Transport – 2007.

Technical Advice Note 18 (Tan 18) – Transport 2007

National transport guidance is set out in TAN 18: 'Transport' and accepts that our quality of life depends on transport and easy access to jobs, shopping, leisure facilities and services; we need a safe, efficient and integrated transport system to support a strong and prosperous economy.

The TAN addresses the following:

- Integration between Land Use Planning and Transport;
- Location of Development;
- Parking;
- Design of Development;
- Walking and Cycling;
- Public Transport;
- Planning for Transport Infrastructure; and
- Assessing Impacts and Managing Implementation.

Local Policy

Regional Policies regarding Transport are set out within Powys County Council Local Development Plan.

Summary

The broiler unit proposed will promote the relevant Policies raised Nationally, Regionally and Locally by offering local employment opportunity. The development will ensure the viability of and long term prosperity of the applicant and will assist in the continued diversity of the farm to ensure sustainable businesses in the rural areas.

8.3 Methodology

8.3.1 Introduction

Several assessments were undertaken within this assessment. The methodology is summarised below. This assessment is carried out in accordance with the DfT's 'Guidance on Transport Assessment' (2007).

8.3.2 Baseline Traffic Assessment and Safety Methodology (including cumulative developments)

Relevant existing traffic flow relating to the applicant's existing business was obtained from the applicants and verified by Roger Parry & Partners LLP using their experience of agricultural traffic generation from similar enterprises. All other movements associated with the business will remain unchanged and are not considered in this assessment.

The traffic assessment for this development was reviewed to provide information on associated traffic generation.

8.3.3 Traffic Generation and Assignment (Including Construction/Demolition Traffic Generation)

Under the subheading "Development and Trip Generation" within the Dft's *Guidance on Transport Assessment* (2007) 4.59 and 4.60 state:

"4.59 There is a range of trip rate database tools available that contain national, or in some cases more local, trip rates measured for typical land use sites. However, obtaining an accurate comparison is not always straightforward, especially for atypical developments. In these instances it is recommended that, unless there is a clear valid comparable situation, the assessment trips should be constructed from first principles based on a detailed analysis of the daily operation of the proposed development."

"4.60 In all cases, analyses of development-related trips by using an appropriate database or an alternative methodology should be agreed with the relevant authorities, as this will form the major element of the TA."

This development is typical and no TRICS data exists, therefore the traffic / trip generation has been produced using details regarding expected worst case scenarios. The movements to be generated by the operation of the poultry installation were derived principally from experience of existing poultry units for which planning permission was obtained by the applicant's agent including poultry units. Data from Defra and industry standards were also used to assess tonnes of feed consumed and bird outputs.

To ensure that generation estimates were robust and a worst case the following assumption were used:

- When calculating total movements 7.6 crop cycles per year have been assumed.
- When calculating manure production the highest Defra figures were assumed.
- When calculating bird output the highest kilograms per square metres were assumed.
- When estimating feed deliveries the highest Feed Conversion Rates were assumed.

Construction traffic was derived from estimating the maximum numbers of construction workers and material deliveries to the construction site given the nature of the proposals and the expected three month construction programme. It was assumed that decommissioning traffic would be similar to that for construction.

8.4 Baseline Conditions

8.4.1 Road Network

The site is accessed off the A483 between Llanymynech and Four Crosses. The site is accessed off Domgay Lane from an improved existing access as per the site and location plans leading to the buildings.

Feed HGVs will be coming from a local feed company using the A483 and then as above.

The movements for the proposed buildings will occur at the same time as those for the existing buildings and therefore there will be no increase in traffic movements.

8.5 Prediction and Assessment of the Potential Impacts

8.5.1 Construction/Decommissioning – Generated Traffic

Estimates of construction traffic are summarised in Table 22.

Table 22: Traffic Movements for Construction

Type	Total Movements (Approx)
Stone	95
Concrete	88
Steel and shed materials	12
Feed Bins	2
Employees	Approximately 8 per day for month and a half during weekdays

It is expected that the construction timescale will be approximately 6 months. It has been assumed that traffic levels during the decommissioning period would be similar to that during construction. As for operations HGVs will access the site from the A483 and Domgay Lane.

8.5.2 Operation – Generated Traffic

Due to the nature of the poultry enterprise it is not possible to give an accurate daily average as the movements are concentrated around certain activities during the cycle. Feed movements increase during the crop cycle as bird weights increase. Manure removal takes place in a short period between bird removal and chick placement and the direction of the movements will vary. Bird removals take place in two waves each lasting two days during the crop cycle. On 23 days of the 48-day crop cycle there will be **no** movements and on a further 15 days of the crop cycle there will only be one vehicle visiting the site.

Bird removal at the close of the crop represents peak movements in any given 24 hour period. Bird removal may take place during night time, due to the factory opening times. Crop clearance / thinning will take place over a two day period. The maximum number of movements per hour during the night time is estimated at 2. The maximum number of movements in a twenty four hour period associated with bird removal will be 14.

The following sections provide analysis of how the Trip Generation was derived:

Manure

Defra provide calculations for excreta production and the relevant Nitrogen content in leaflet 3 of the Defra Nitrate Vulnerable Zones Guidance documents. Using these calculations as a worst case scenario the proposed development would produce 23.8 tonnes of manure per annum (based on 40,000 birds)

The movements below are based on the additional 40,000 birds:

Manure is transported in 14.5 tonne loads by tractor and trailer; as a worst case, there would be 14 loads / 28 movements per annum.

In accordance with the Codes of Good Agricultural and Environmental Conditions and Cross Compliance Regulations, the total manure to be spread on land at Domgay Hall will be 24,355.9kg N (143.27 hectares with 170kg per hectare of total nitrogen). The excess manure will be exported off site to Thornfield 003 Ltd AD plant (we refer you to Thornfield 003 Ltd AD plant letter within the manure management plan) as per GN021 Section 4 – contingency for storing manure and slurry. Should the excess manure not be able to be exported to Thornfield 003 Ltd's AD plant, there are a number of covered areas on the farm to allow for storing of the manure. We refer you to the manure management plan submitted as part of the proposed development.

Bedding

Wood shavings used as bedding material will be delivered at the beginning of the crop cycle at a rate of approximately 1.72kgs per square metre amounting to 16 tonnes per crop. Wood shavings are delivered in a maximum of 23 tonnes per load. There would therefore be one delivery / two movements per crop or 15.2 movements per year.

Chick Deliveries

The chicks would be delivered in 60,000-bird maximum load sizes. There would therefore be 1 deliveries / 2 movements per crop or 14 movements per year.

Feed Deliveries

Total feed consumed per crop would be 142 tonnes. This amounts to 28 tonne loads amounting to 5 loads / 10 movements per crop or 70 movements per year.

Fallen Stock

For the first three weeks of the production cycle carcasses will be stored in a frozen store on site to reduce unnecessary vehicle movements. Thereafter the fallen stock will be collected on a once weekly basis by a small HGV. This will require three collections / six movements per crop amounting to 46 HGV movements annually.

Fuel deliveries

There will be one delivery / two movements of LPG per crop.

Bird Collections

Bird collections will be carried out in two waves: "thinning" at days 35 and 36 when all of the cockerels are removed and "crop clearance" at days 41 and 42. Birds are collected by HGVs in loads of 6,650 birds. There would therefore be 6 loads / 12 movements per crop and 84 movements per year. A proportion of bird removal takes place during night time due to factory opening times and bird welfare. It is estimated that there will be four movements during night time.

Labour for catching birds during depletion of the units will be provided by the purchasing company. The labour force will arrive in a mini-bus at a rate of one minibus per bird removal day which will amount to four loads / eight movements per crop therefore 60 movements per year.

Other movements

Other car and van movements (vet, inspectors, engineers, specialist cleaning teams and maintenance staff) can be attributed to the proposed unit, but numbers are small and of no significance as they are likely to be during the working day and on an infrequent basis with little potential to create disturbance.

8.5.3 Routing

The site is accessed off the A483 between Llanymynech and Four Crosses. The site is accessed off Domgay Lane from an improved existing access as per the site and location plans leading to the buildings.

Feed HGVs will be coming from a local feed company using the A483 and then as above.

8.6 Mitigation

For appropriate design standards, reference is made to the Design of Roads and Bridges (DMRB); Section 1 – Highway Link Design TD9/93 for Design Speeds and Section 2 – Geometric Design for Major/Minor Junctions TD 42/95 for visibility splays.

8.7 Potential Cumulative Effects

There is no potential for cumulative traffic impacts as a result of no existing or proposed (not committed) poultry developments in close proximity to the development.

8.8 Residual Impacts

Sensitive routing of deliveries will ensure that impacts of traffic on residences are minimised. No significant impacts are expected regarding pedestrians, cyclists or public transport.

8.9 Summary and Conclusion

As a result of the proposal there will be a small increase in traffic in a limited number of settlements such that the baseline conditions including living conditions will change. The small increases in traffic are however offset by the predicted reduction in the use of the local highway network following the cessation of manure imports and the reduction in movements. The majority of traffic movements for the proposed two buildings will take place at the same time as the existing poultry unit and therefore there will only be a slight increase in traffic movements.

This assessment has demonstrated that the proposals are estimated not to have a significant effect on the surrounding highway network, and that the safety conditions of the network would not be made worse.

Based on the analysis provided in this assessment, there does not appear to be any significant transport related reason why these sites should not be granted Planning Permission.

CHAPTER 9 – AMENITY

9. Amenity

This chapter deals with the potential for odour, dust and flies to be produced by the poultry installation which cause an impact in the local area. By conducting risk assessments, and analysing the recent nuisance complaint history of other sites in the area, the assessment concludes that no significant impacts are likely given the lack of complaints made for other such facilities, the isolated location of the proposal and the integral controls to be applied.

9.1 Introduction

9.1.1 Context

The poultry installation at Domgay Hall has the potential to affect amenity issues in the area. This chapter presents the findings of a series of risk assessments that have been carried out to assess the potential implications of the poultry development on local amenity. The issues that have been assessed are:

- Odour;
- Dust (construction, operation (including bio aerosols) and decommissioning);
- Flies; and
- Vermin

It is acknowledged that noise could also be considered to be an amenity issue. However, rather than being assessed here, noise has been included as a separate chapter (Chapter 11 – Noise and Vibration) given the availability of advanced quantitative noise assessment techniques. The overall results are presented in this chapter.

9.2 Legislation, Planning Policy and Other Guidance

9.2.1 Legislation Regulating Nuisance

Statutory nuisances are regulated by Part III of the Environmental Protection Act (EPA) 1990. The powers allow for action to be taken by local authorities or individuals against statutory nuisance that exists or is likely to occur or recur. Statutory Nuisances include:

- smoke, fumes or gases emitted from premises;
- any dust, steam, smell or other effluvia arising on industrial, trade or business premises, which are prejudicial to health or a nuisance.

It should be noted that there is a defence of using Best Available Technique (BAT) to prevent the nuisance or counteract its effects together with reasonable excuse. The granting of planning permission is not a defence.

The planning and pollution control systems are separate but complementary. Pollution control is concerned with preventing pollution. The planning system is concerned with the development and use of land. It should focus on whether the development itself is an acceptable use of the land, and the impacts of those uses, rather than the control of processes or emissions themselves. Planning authorities should work on the assumption that the relevant pollution control regime will be properly applied and enforced.

9.2.2 Planning Policy

General

Few planning policies relate directly to the specific amenity issues assessed in this chapter of the ES. Within the Powys Local Development Plan the following policies apply:

Policy DM13 – Design and Resources
11. The amenities enjoyed by the occupants or users of nearby or proposed properties shall not be unacceptably affected by levels of noise, dust, air pollution, litter, odour, hours of operation, overlooking or any other planning matter.

9.3 Method of Assessment

9.3.1 Method

The risk assessment technique used in this assessment has been based on guidance relating to intensive livestock farming (from the Environment Agency's (EA's) 'Simple assessment of environmental risk for accidents, odour, noise and fugitive emissions (EPR – H1) – Version 080328 (March 2008)) and includes comprehensive management plans based on accepted guidance and Best Available Technique (BAT). This method was agreed with Powys Council Environmental Health Department. The methodology utilises a range of simple checklist tables to identify sources, receptors and pathways in relation to potential amenity issues.

The types and sources of potential nuisances are identified and the potential sensitivity of individual receptors is qualitatively assessed. This is based upon the nature of, and proximity to hazard generating activities, general wind direction frequencies and the nature of the receptor. In addition, the scope and efficacy of integral controls have been accounted for.

In addition to the above method, historic complaints made to the Environmental Health Department regarding other poultry sites in the vicinity have been analysed in order to judge the frequency of complaints in relation to the amenity issues being assessed at similar sites. Magnitude and significance have been assessed using professional judgement based on the general expected intensity and frequency of any potential impact against the number, nature and sensitivity of receptors potentially affected. For example, a major, long term, release of odour, dust or flies etc. affecting large numbers of residential receptors to a level that would be likely to cause nuisance and complaint, and which is assessed to be a probable occurrence, would constitute an impact of Major Significance. Conversely, a minor release, barely detectable by a very limited number of industrial receptors, and which is assessed as being unlikely to occur, would constitute an impact of Minor or Negligible Significance.

9.3.2 Difficulties Encountered

The nature of the issues being assessed (generally relating to highly variable, intermittent and, therefore, unquantifiable emissions and subjective human responses to them) does not allow reliable quantitative assessment to be carried out. As such, the following assessments are based upon professional judgement and qualitative risk assessment, as set out above, and the experience of the agricultural industry in Wales.

9.4 Baseline Environment and Sensitive Receptors

In terms of other potential sources of amenity impacts, Domgay Hall site lies within an area of livestock farming where the land management operations includes application of poultry manure to the land and storage of poultry manure in fields, both of these activities are potential sources of flies and odour. However, in order to make a worst case assessment of the potential impacts from the proposals, it has been assumed that no amenity issues currently affect sensitive receptors in the locality.

Potentially sensitive receptors within approximately 400 metres of the site were identified and general receptors were identified around the areas where the poultry manure will potentially be spread and stored within fields. (N.B. distances are from the edge of the proposed operational area) The receptors listed in Table 26 are indicated on Appendix 13.

Table 26: Sensitive Receptors

Ref	Name	Easting	Northing	Distance from development to residential curtilage / footpath (m)
SR1	Maesderwen	327981	319261	105
SR2	Oakhurst	327935	319164	158
SR3	The Oaks	327582	318979	368

9.5 Incorporated Mitigation

Standard Odour, Dust, Vermin and Fly management controls will be put into place. These have been taken account of in the assessment as they are an integral part of the overall design and operations and are considered Best Available Technique; these management controls are detailed in Chapter 4 – Details of the Development.

9.6 Complaints History of local sites

9.6.1 Complaints History

No complaints have been made by the public to the Environmental Health Officer (EHO) for local sites within 5 miles that we are aware.

9.6.2 Odour

Generally complaints about odour from agricultural sources are common but the largest numbers of complaints arise from the spreading of manure. The original MAFF Code of Good Practice for the Protection of Air (The Air Code) since updated by *Protecting our Water, Soil and Air – A Code of Good Agricultural Practice for farmers, growers and land managers* states that there were about 9,000 complaints in England & Wales caused by agriculture in 1995/96, involving an estimated 3,646 farm premises. However odour is rarely an issue at an efficiently operated modern poultry unit as illustrated by the minimal instances of complaints received in relation to the site at Felton Butler 13 miles away. No complaints have been received by the existing operational poultry unit at Domgay Hall.

Research evidence suggests that odour emissions at the time of the growing period during the flock cycle when litter moisture is also rapidly increasing or at high levels. It is known that when litter moisture exceeds 40% there is a progressive decline in the friability of the litter as the moisture increases. When litter moisture reaches 46% the litter becomes capped, i.e. a crust forms, often on top of more friable litter under it. Excreta and moisture accumulate on the capped litter with the result that the activity of anaerobic bacteria break down the excreta and allow moisture to be absorbed is reduced. There is a shift to an aerobic breakdown with consequence that the release of volatile odorants is increased. It is therefore desirable to put strenuous efforts into management practices and building design that lead to low litter moisture levels. Odour emissions will be less and performance, welfare and profitability enhanced. These problems can be avoided and are not anticipated at the application site and will be controlled at source through management practices to keep litter at optimum moisture content for keeping it friable. This will be achieved through management of the shed litter, providing adequate ventilation, controlling shed temperature and humidity, and through dietary manipulation. Odour causes most impact during the cleaning out period and spreading / storage rather than during the crop cycle.

Odour from spreading causes minimal nuisance as the manure is incorporated into the land with cultivation methods soon after being spread therefore the duration of the nuisance is minimal. The nutrient value of manure decreases the longer it is left exposed on field surfaces prior to incorporation. It is therefore a commercial incentive to incorporate rapidly thus reducing the duration of odour instances. Spreading practices are and will continue to be carried out in accordance with the Environment Agency Sector Guidance Note *How to comply with your environmental permit for intensive farming* (Version 2 January 2010), the DEFRA *Code of Good Agricultural Practice (CoGAP)*.

9.6.3 Dust

As for odour the dust / bio aerosols at an operational poultry installation are generally not an issue. Within poultry buildings the main sources of dust are the birds, their food and the floor litter. Measurements of dust concentrations have been found to be variable depending on the number and age of the birds as well as the level of activity within the buildings. The particle size of dust is variable too. In general terms, particles smaller than 2 microns (2 um) account for around 70% of the number of particles, but only 5% of the mass. Similarly particles greater than 5 microns (5 um) account for under 10% of the number but between 40 and 90% of the dust mass.

The particles are emitted into the atmosphere through the ventilation system. The amount of dust emitted is influenced by the level at which the ventilation system is operating. In hot summer weather conditions, for example, the ventilation system will be operating at a higher rate.

Dust baffles will be erected adjoining the ventilation fans to avoid any dust or odour becoming airborne (See Chapter 4). The larger dust particles (5 microns/5 um and over) found within the building either tend to fail to migrate to the ventilation fans, or are expelled from the building and are immediately deposited to the ground. Once released to the atmosphere smaller dust particles will be carried on the wind, with deposition continuing under the natural turbulent flow of the air. With increasing distance from the source there will come a point where the concentration of dust particles which originate from the poultry buildings fall into a level below air quality guideline values as laid down by the EU and eventually become indistinguishable from normal background dust levels.

9.6.4 Flies

Flies are not a problem on a well managed and hygienically run broiler site; due to the feeding habits of poultry any maggots that hatch in the bedding are soon eaten.

Fly problems at poorly managed poultry farms can occur in the following areas:

Feed Storage

Animal feed is attractive to flies as a breeding area. Problems mainly occur when feed is stored in unsuitable buildings or storage bins that do not function effectively.

These breeding areas are designed out of the majority of poultry farms by installing modern feed storage systems to meet the requirement of the Food Hygiene Regulations and the assured chicken production scheme standards.

Field Manure Storage

- No poultry manure from the proposed development will be stored in in-field manure heaps. It will either be spread directly on to the land or will be taken off farm to a local AD plant. Should the manure not be able to be exported off site it will be stored in existing covered areas on the farm.

9.6.5 Vermin

Large quantities of stored feed and stored litter have the potential to attract a variety of animals that are considered vermin. The site will be inspected regularly to check for the presence of vermin and employees will be instructed to report the presence of any vermin immediately. The applicants will be fully trained and certified in vermin control and the companies for which the chickens are grown stipulate strict regimes for vermin control.

9.7 Potential impacts

9.7.1 Sources, Pathways and Potential Impacts

The principal sources of amenity impact, the pathways by which they can be transferred to receptors and their potential impacts are set out for each issue in Table 27.

Table 27: Amenity Issue, Sources, Pathways and Potential Impacts

Issue	Sources	Pathways	Potential Impacts	General Available Mitigation
Odour	Feed Delivery & Storage, Ventilation system, Litter management, carcass disposal, house clean out, used litter, dirty water management	Wind transport. Dispersal tends to be worst in stable night-time conditions in low winds.	Nuisance for walkers on footpaths within 400 metres of the site	Management controls to reduce moisture content of litter. Equipment checks to reduce likelihood of failure. Manure handling controls during cleanout to reduce spillage. Manure transporting controls (e.g. sheeting trailers)
Dust	Dust – vehicles moving over dusty surfaces, wind blowing over dusty surfaces. Dust emissions from within buildings through ventilation.	Wind transport. Tends to disperse more rapidly than gases due to vertical deposition under gravity (nuisance not generally experienced beyond 100m). Greater emissions of dust in high winds but counteracted by greater dilution.	Irritation of respiratory tract/eyes and/or perception of health effects for sensitive receptors on footpaths within 400m of the site.	Dust Baffle over ventilation fans. Internal handling of manure. Good practice during construction (e.g. dampening of surfaces)
Flies	Manure storage	Self dispersal through flight.	General annoyance, buzzing, requirement for swatting and control, and potential for spread of disease.	Storage of manure away from sensitive receptors. Regular inspection to identify infestations.
Vermin	Feed storage	Self dispersal over land	General annoyance, requirement for control and potential spread of disease.	Storage of feed within concealed containers. Maintenance of feed storage containers to avoid damage / deterioration. Removal of feed spillages if they occur.

9.8 Risk Assessment Results

The results of the risk assessments are summarised below. Due to the nature of the operations, the integral controls and the isolation of the facility from sensitive receptors, no receptor was considered to be more than moderately sensitive to any amenity issue potentially arising from the poultry development.

9.8.1 Odour

If odour were to be released from on site operations some limited receptors nearby could potentially be effected. However, this presupposes the regular emission of odours from the poultry installation. In reality, during normal operations odour emissions will be minimal due to the proposed management practices. As such, any odorous emissions, if present, would be minor, intermittent and rare. This conclusion is backed up by the low number of odour complaints attributable to modern poultry developments in this area.

At this location, for odour to be released in any appreciable amount at the level to cause a significant nuisance to the local population, serious operational failures would be required (e.g. total closedown of the ventilation whilst birds continue to be housed). The houses are alarmed and management personnel will always be within a 2 minutes response zone from the buildings to repair failed equipment as such a failure would result in multiple mortalities and in a worst case scenario entire crop loss.

The results of the risk assessments would suggest that, whilst the majority of potentially sensitive receptors lie some distance away from the poultry installation, a few may lie close enough to potentially be affected if odour were to be released in appreciable amounts. These receptors include:

- Maesderwen

An odour management plan has been adopted by the applicant, the management plan is provided at Appendix 14. This management plan is also included as part of the Environmental Permit application and Natural Resources Wales will regulate the site and ensure that the site adheres to the plan.

9.8.2 Dust

Similar to odour there are few sensitive receptors occurring close enough to be affected by any dust emitted (coarse dust tends not to travel in appreciable volumes further than 100 metres from any local source due to exponential reductions in concentration and deposition with distance). As such the receptors at any risk due to dust emissions are only likely to effectively include roads along which construction vehicles will travel. Such receptors are unlikely to be particularly sensitive to dust and the vehicle movements will not alter the baseline significantly. Also, the prevailing wind direction is not towards any receptors sensitive to dust.

In terms of dust emissions, the greatest risks are likely to occur temporarily and intermittently during the construction and decommissioning phases when loose materials are being handled. During the operational phase dust emissions will be controlled at source through management practices and all vehicles removing manure from the site will be covered.

Given that the greatest dust emissions are likely to occur in the relatively short construction and decommissioning phases and there are few sensitive receptors close enough to be effected, and those that are present are outside the prevailing wind direction from the poultry installation, it is considered that no significant impact in terms of dust nuisance will occur. This conclusion is supported by the low level of complaints made at the other poultry sites in this area. The one complaint that was made regarding dust was in response to fears regarding Avian Flu. Nevertheless, there is still some minimal risk of dust impacts during construction which will require mitigation via best practice.

Compound feed is stored in purpose-built feed silos located to the North and South sides of the sheds. The feed will be crumbed or pelleted, or supplied as whole wheat which reduces dust.

All feed is delivered to the farm by lorry from the feed supplier. Feed is blown directly from the lorry into the storage silos. It is then piped from the silos to all houses, so minimising dust emissions.

Control of ventilation rates will avoid a build-up of dust and moisture in the houses, with rates being varied according to the age and weight of the birds and the weather conditions.

The houses will be managed to maintain litter in a dry and friable condition, as far as possible. Dust will be controlled through good management and regulation of air quality.

Some dust from the gable end fans in each house may be deposited into a covered catchment area. This will be collected and added to the used litter for land spreading.

Used litter will not be stored close to the poultry houses. During the removal of used litter from the houses, efforts will be made to minimise tip height in order to reduce dust emissions.

9.8.3 Flies

There is a slight occasional risk that the spreading of manure in summer could introduce a potential source of flies into the area that would not otherwise occur. However, with the proposed mitigation controls in place and with prompt incorporation of the manure into the soil it is expected that no significant fly impacts will result. The result of the risk assessment indicates that there would be a considerable number of sensitive receptors in close proximity to areas where manure spreading will take place, however the control measures will limit the effect of flies on these sensitive receptors.

Fly nuisance problems are considered unlikely because of the nature of the activities and because of the comparatively short cycle length. Appropriate actions will be taken should a nuisance problem arise.

9.8.4 Vermin

Vermin are only a potential risk in close proximity to the source. With the proposed mitigation and management controls it is expected that no significant vermin impacts will result. The results of the risk assessment indicate that the separation distance between the site and sensitive receptors would be too great to have any impact.

9.8.5 Cumulative Impacts with Other Developments

We do not believe there to be any cumulative impacts with other developments.

9.9 Follow Up Action

During operation the poultry installation management plans will be put in place to ensure that amenity issues do not become a problem. The site will be regularly inspected by the staff to ensure that no odour, dust, fly or vermin issues are arising. If complaints are received these will be logged and immediately followed up and assessed as part of the applicant's environmental management systems. The site will also be regularly inspected by NRW as part of the Environmental Permitting system. Any significant releases of odour, dust, flies or vermin will be dealt with as appropriate at the time to ensure no repetition.

9.10 Residual Impacts and Conclusions

The qualitative risk assessments and complaints analyses carried out suggest that significant adverse impacts on local amenity as a result of the poultry installation are unlikely. It is predicted that the impacts of the poultry installation would be acceptable, given the distance between existing sensitive receptors and the nature of the operations. However, it is acknowledged that the issues discussed in this chapter are sensitive to local people. As such, a range of standard mitigation measures, that have

been highly successful in other similar operations, would be put in place to minimise any potential adverse impacts.

CHAPTER 10 – ECOLOGY

10. Ecology

This chapter deals with the potential impacts of the poultry installation on designated and undesignated habitats and protected species. Habitats are generally of low value given the use of the site for intensive agricultural production. No protected species are known to use the site. Without mitigation the construction, operation and decommissioning of the poultry installation may affect habitats and species via disturbance. However proposed mitigation measures (providing habitat including conservation strips, woodland planting and wetland areas and the use of sensitive construction methods) will ensure that impacts are minimal and biodiversity will be enhanced.

10.1 Introduction

This chapter assesses the likely significant impacts of the poultry installation on the ecology of the development site at Domgay Hall in Powys and the wider area.

Schedule 4 of the Environmental Impact Assessment (EIA) Regulations states that an Environmental Statement (ES) should include a description of the aspects of the environment likely to be significantly affected by the development, including flora and fauna, although there is no statutory provision as to the form an ES should take.

To obtain information on the site's baseline ecology, the following have been undertaken:

- A desk based study

This chapter describes the findings of the field-based surveys, the desk-based study and consultation, considers the potential impacts arising from the proposed poultry installation and proposes appropriate mitigation measures.

10.2 Legislation

10.2.1 Designated Sites

Designated sites are areas of high nature conservation value which are protected to varying degrees by statute, international conventions, or local authority planning controls. The sites form a network of habitats which may be of Global, International, European, National, Regional or Local importance.

Generally, the priority for the protection of designated sites is as follows:

1. Global/International/European/National sites (Special Areas of Conservation - SACs, Special Protection Areas (for birds) - SPAs, Sites of Special Scientific Interest - SSSIs);

2. Regional or Local sites;

3. Other wildlife sites.

The protection afforded to sites by local authority designations, such as Sites of Biological Importance (SBIs), County Wildlife Sites (CWS), Local Nature Reserves (LNR) and Sites of Importance for Nature Conservation (SINC), is normally significantly less than for statutory designations. Such designations are predominantly for planning purposes only and, while a local authority may have a stated policy of avoiding development in these areas, there is no statutory protection process.

10.2.2 Protected Species

In addition to habitats, a number of species are considered to be rare or subject to persecution and are also afforded protection through International/European and National law. Other species are considered to contribute to our 'quality of life'. Although these species do not benefit from legal protection, the possible effect that development may have on their habitat can be an important material consideration.

The Wildlife and Countryside Act (WCA), 1981, as amended, The Protection of Badgers Act 1992 and the Habitat Regulations 1994 are the main legislative frameworks for the protection of wild animals in the UK.

Proposers of a development must be able to show that all reasonable measures have been taken to ensure that protected species are not subject to disturbance. The habitats of all Schedule 2 species in the Habitat Regulations, WCA Schedule 1 and some WCA Schedule 5 species are also protected from disturbance and destruction. Again, all reasonable precautions should be taken to ensure that disturbance does not happen.

10.3 Planning Policy

The following sections briefly outline the policies that are relevant to the ecology of Domgay Hall site at International, European, National and Local levels.

10.3.1 International, European and National Legislation

The UK is bound by the terms of the Birds and Habitats Directives and the RAMSAR Convention. The Conservation Regulations 1994 (the 'Habitats Regulations') provide for the protection of 'European sites', which are Special Areas of Conservation (SACs) designated pursuant to the Habitats Directive, and Special Protection Areas (SPAs) classified under the Birds Directive.

The Regulations apply specific provisions of the Habitats Directive to candidate SACs (cSACs), SACs and SPAs which require special considerations to be taken in respect of such sites. The RAMSAR convention aims to protect wetlands of international importance for birds.

The protection and management of internationally designated sites are achieved by a combination of the provisions of the Habitats Regulations and Section 28 of the Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way Act 2000.

10.3.2 National Planning Policy

Technical Advice Note 5 (TAN 5) provides the Governments advice on how the land use planning system should contribute to protecting and enhancing biodiversity and geological conservation. The principal aims of TAN 5 are:

- The key principles of positive planning for nature conservation;
- Nature conservation and Local Development Plans;
- Nature conservation in development management procedures;
- Development affecting protected internationally and nationally designated sites and habitats; and
- Development affecting protected and priority habitats and species.

TAN 5 states that Biodiversity conservation and enhancement is an integral part of planning for sustainable development. The planning system has an important part to play in nature conservation. The use and development of land can pose threats to the conservation of natural features and wildlife. Past changes have contributed to the loss of integrity of habitat networks through land-take, fragmentation, severance, disturbance, hydrological changes and other adverse impacts. But development can also present significant opportunities to enhance wildlife habitats and the enjoyment and understanding of the natural heritage. Whilst the planning system needs to be watchful of the cumulative effects of a series of small, perhaps occasional, apparently insignificant losses from the natural world, which can combine to seriously deplete the natural heritage, including essential hydrological and ecological systems; small scale opportunities for habitat creation and

enhancement can be significant and can build into major contributions over time. This TAN demonstrates how local planning authorities, developers and key stakeholders in conservation can work together to deliver more sustainable development that does not result in losses from the natural heritage but instead takes every opportunity to enhance it.

The key principles for the planning system to deliver nature conservation are appended below and covered within TAN 5:

- work to achieve nature conservation objectives through a partnership between local planning authorities, CCW, the Environment Agency Wales, voluntary organisations, developers, landowners and other key stakeholders (PPW 5.1.5 and 5.2.5);
- integrate nature conservation into all planning decisions looking for development to deliver social, economic and environmental objectives together over time (PPW 5.1.3 and 5.1.4);
- ensure that the UK's international and national obligations for site, species and habitat protection are fully met in all planning decisions (PPW 5.3.8-10);
- look for development to provide a net benefit for biodiversity conservation with no significant loss of habitats or populations of species, locally or nationally (PPW 5.1);
- help to ensure that development does not damage, or restrict access to, or the study of, geological sites and features or impede the evolution of natural processes and systems especially on rivers and the coast (PPW 1.4.14, 2.2.1, 2.3.2 and 5.6.3);
- forge and strengthen links between the town and country planning system and biodiversity action planning particularly through policies in local development plans and the preparation of supplementary planning guidance that adds value to Local Biodiversity Action Plans (LBAPs) by highlighting the ways in which the planning system can help to deliver the objectives of LBAPs in practical ways (PPW 5.4.2);
- plan to accommodate and reduce the effects of climate change by encouraging development that will reduce damaging emissions and energy consumption and that help habitats and species to respond to climate change (PPW 2.2.1 and 2.3.2).

The Conservation (Natural Habitats etc) Regulations 1994 transpose the Habitats Directive (92/43/EEC) into national law. The Regulations provide for the designation and protection of "European sites," and the protection of "European protected species." As part of the planning process, the authority is required to carry out an appropriate assessment to establish whether a proposed development would adversely affect the integrity of any such European sites. Such a development could only be granted planning permission under very restricted circumstances.

10.3.3 Local Planning Policy

The protection of international and national sites of nature conservation and ecological importance is addressed in policies within the Powys County Council Local Development Plan.

10.4 Other Guidance

10.4.1 The UK Biodiversity Action Plan (UKBAP)

The UK Biodiversity Action Plan (UKBAP), published in 1994, sets out the UK's response to Article 6 of the European Convention on Biological Diversity. There are currently 391 Species Action Plans (SAP) and 45 Habitat Action Plans (HAP) that extend across the UK. These habitats and species are listed in Section 74 of The Countryside and Rights of Way (CRoW) Act 2000 and are those that the Secretary of State, following consultation with Natural Resources Wales (NRW), consider are of principal importance for the conservation of biological diversity in Wales. A UK BAP report identifies the following as the prime threats faced by priority habitats and species:

- **Habitat loss/degradation** (particularly due to agriculture or changes in management practice) continues to be a significant threat for a high proportion of species and habitats. Woodland management and loss of trees, and change in habitats due to succession, are also of particular concern for species;

- **Infrastructure development** (mainly housing infrastructure and development on the coast) is emerging as a particular concern for species and habitats. This underlines the importance of the protected sites network and the crucial role of the planning system in safeguarding biodiversity;

- **Global warming** is an emerging threat for a high proportion (47%) of habitats.

10.4.2 Local Biodiversity Action Plans (LBAP)

Domgay Hall site lies within Powys and thus local ecological management is guided by the Powys Biodiversity Action Plan. The purpose of this document is to set out proposed biodiversity action plans for the main valuable habitats (e.g. woodlands, wetlands) and species (e.g. otter *Lutra lutra*, skylark *Alauda arvensis* etc.) in Powys. The plan discusses the current extent of the particular habitat or species, the problems it faces and the potential for positive change. The broad overall long-term objectives are followed by more specific short-term targets which add detail on what may be achieved and by when.

10.4.3 Desk Based Study

Statutory Sites

A number of statutory designated sites occur within 5km of Domgay Hall, Table 28 below details sites within 5km and the reasons for their designation in terms of ecology.

Table 28: Statutory designations within 5km of the site

Name	Distance
Montgomery Canal	1.42km
Llanymynech & Llynclys Hills	2.56km
Gweunydd Ty-Brith	3.59km
Blodwel Marsh	4.33km
Breidden Hill	4.66km
Morton Pool & Pasture	4.99km

Habitats

In summary the Domgay Hall site largely comprises an arable field with limited habitat.

Hedgerows

The field is surrounded by boundary hedges. Existing hedgerows will be allowed to grow providing habitats for birds and other species.

Hedgerow Trees

No hedgerow trees will be affected by the proposal.

10.4.4 Ecological Evaluation

Statutory and Non-Statutory Sites

None of the habitats within the Domgay Hall site meet the criteria for selecting sites for national importance.

10.5 Assessment of Potential Impacts

10.5.1 Potential Construction, Operational and Decommissioning Impacts

The potential ecological impacts arising from the broiler unit, in the absence of mitigation, are as follows:

Construction: Direct loss and or alteration of habitats for plants or animals, and consequently local loss of species as a result of the physical requirements of development;

Construction: Habitat fragmentation;

Construction: Direct loss to non-statutory designated sites as a result of the construction of the development;

Construction, Operation and Decommissioning: Temporary disturbance to surrounding fauna during construction and permanently during operations arising from noise, and human presence;

Construction, Operation and Decommissioning: Indirect or secondary accidental damage to surrounding habitats (including designated sites) as a result of construction/decommissioning or operational activities, including emissions, pollutants, storage of materials, spillages and site drainage; and

Operation: Indirect impact on statutory, non–statutory designated sites, habitats and species resulting from use of the proposed poultry unit (principally from atmospheric emissions and any releases to watercourses).

10.5.2 Predicted Impacts

Effect of Development on Statutory Sites

The effect on designated ecological sites has been assessed in Chapter 6.

Loss of Non Designated Habitats

Construction works will lead to direct habitat loss, through clearance works and earth moving activities. Disturbance to habitats may also occur via vehicle movements, lay down areas used for storage of materials and the siting of buildings for construction workers. The habitats to be lost are of low intrinsic ecological value and include a large area of intensive arable land. This loss of habitat will have a certain negative impact of minor significance.

The poultry unit footprint includes an area of improved intensive arable land and area of farm storage and waste; these habitats are considered to be of low ecological value in terms of vegetation as intensive arable land contains few species of note. The physical presence of the poultry unit may also affect species moving across the site. The operational phase of the poultry unit will have an indirect effect on habitats by affecting surface runoff and pollution from vehicles. Without mitigation this will have a certain negative impact of very minor significance.

10.6 Mitigation measures

A number of proposals have been put forward below to compensate and mitigate for any loss of habitat or general disturbance to species resulting from the development:

- Ensure all works are carried out outside bird nesting season to avoid any disturbance to these species.
- All existing natural features including hedgerows, trees and water bodies will be protected from accidental damage through protective fencing or other indicative measures as appropriate.

- Creation of earth bunds adjoining the development and village and alongside the Slurry Stores which will provide a habitat for a number of species.
- Creation of woodland planting and conservation strips surrounding the site.
- Create new species-rich hedgerows to west of development.
- Allow surrounding boundary hedgerows to grow up to 3.5 metres and maintain at 2 metres width.

10.7 Follow Up

Special interest groups such as bat, badger and bird enthusiasts will be invited to monitor levels of activity at the site as a result of the landscape plan.

10.8 Summary & Conclusions

No impacts of major or intermediate significance on habitats are judged to be likely. There will be no loss of significant habitat either as a result of the development or associated road improvements. The creation of new species-rich hedgerows and retention of existing mature hedgerows together with woodland plantations will produce an intermediate or major positive effect.

Disturbance to breeding birds will be minimised through the timing of works. There will be no loss of breeding habitat (hedgerow) therefore there will be no concern of Bird Conservation, the creation of new hedgerows and allowing existing hedgerows to grow up, together with the planting of trees to support the development will be of great benefit.

CHAPTER 11 – NOISE & VIBRATION

11. Noise & Vibration

This chapter assesses the noise and vibration impacts of the poultry installation facility on nearby residential receptors. Impacts arising from construction, operation and decommissioning and associated traffic are assessed, where appropriate, using quantitative techniques. Using worst case assumptions regarding operational noise emissions, traffic levels and noise insulation levels of the building fabric, all predicted impacts are minor or negligible only. Impacts will be easily mitigated by incorporating appropriate noise baffling and insulation.

11.1 Introduction

11.1.1 Scope

There is the potential for noise from the poultry installation to affect sensitive receptors around the site and, as such, the following impacts have been considered within this assessment. Sensitive receptors are predominantly residential properties around the site.

Chapter 4 (Development Description), sets out the detailed design for the poultry installation.

The operation of the poultry installation is not considered to have the potential to generate significant sources of vibration. As such, the impacts from vibration during the operation of the poultry installation have not been considered further.

For decommissioning of the poultry installation site, the resultant noise impacts would be likely to be similar to those for the construction phase.

11.1.2 Consultations

The Environmental Health Department of Powys Council have previously been contacted with regard to the scope of the assessment, methodologies used and sensitive receptor locations. The following assessment methodology and content has been agreed in this context.

11.1.3 Terminology

Relevant British Standards and planning guidance refer to noise in decibels (dB). The decibel scale is logarithmic rather than linear; hence a 3dB increase in the sound pressure level represents a doubling of sound energy present. Judgement of the loudness of a sound is subjective but, as a general guide, nothing less than a change of 10dB corresponds to a doubling of perceived loudness.

The A weighted sound level, dB(A), takes this response into consideration and is used for the measurement of environmental noise. It can be used to indicate the subjective human response to noise.

Environmental noise usually varies continuously from second to second. It is impractical to specify the sound level for each second. As such, human response has been related to various units, which allow for the fluctuating nature of sound.

These include;

- **LAeq,t** – The A weighted equivalent continuous sound pressure level. A representation of a continuous sound level containing the same amount of sound energy as the measured varying noise over the measurement period, t.
- **LA90,t** – The A weighted sound pressure level that is exceeded for 90% of the measurement period, t. This is commonly used as the background noise level for assessing the effects of industrial noise in the UK.

- **LA10,t** – The A weighted sound pressure level that is exceeded for 10% of the measurement period, t. This is commonly used in the UK for describing traffic noise levels.

- **LAMax** – The highest A weighted noise level recorded during a noise measurement period.

11.1.4 Legislation, Planning Policy and Other Guidance

Noise nuisance in the UK is principally governed under Statutory Nuisance legislation under the Environmental Protection Act (1990 – as amended). No legal standards regarding noise levels are applied; however, guidelines are provided both in British Standards (BS) and by the World Health Organisation (see later sections of this chapter). Noise nuisance is generally policed by Local Authority Environmental Health Departments.

TAN 11 Noise (1997) provides advice on how the planning system can be used to minimise the adverse impact of noise without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens of business. It outlines some of the main considerations which local planning authorities should take into account in drawing-up development plan policies and when determining planning applications for development which will either generate noise or be exposed to existing noise sources.

11.2 Methodology & Approach

11.2.1 Documents Consulted

The noise impact assessment has assessed the potential impact of noise and vibration from the poultry installation (including both normal noise emissions and any occasional intense noise sources) and alterations to traffic flows during the construction, operation and decommissioning phases. The following guidance has been used for the assessment;

- Technical Guidance Note IPCC SRG 6.02 (Farming)

The technical note sets out guidance and best practice for the assessment of noise at pig, poultry and sow installations. The guidance is applicable to intensive poultry operations with at least 40,000 birds; development which are subject to Integrated Pollution Prevention and Control (IPPC).

Guidance details under what circumstances a noise impact assessment may be required and states that the assessment methodology must follow the procedure as detailed in British Standard 4142:1997 Method for rating industrial noise affecting mixed residential and industrial areas, which has now been superseded.

- BS4142:2014

British Standard 4142:2014 Methods for rating and assessing industrial and commercial sound is intended to be used to assess the potential adverse impact of sound, at nearby sensitive receptor locations.

Where the specific sound contains tonality, impulsivity and/or other sound characteristics penalties should be applied depending on the perceptibility.

The sound contains identifiable operational and non-operational periods that are readily distinguishable against the existing sound environment, a further penalty of 3dB may be applied.

The assessment of impacts outlined in BS4142:2014 is undertaken by comparing the sound rating level, i.e. the specific sound level of the source plus any penalties, to the measured representative background sound level immediately outside the sensitive receptor location. Consideration is then given to the context of the existing sound environment at the sensitive receptor location to assess the potential impact.

Once an initial estimate of the impact is determined, by subtracting the measured background sound level from the rating sound level, BS4142:2014 states that the following should be considered:

- Typically, the greater the difference, the greater the magnitude of the impact
- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context; and
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. It is an indication that the specific sound source has a low impact when the rating level does not exceed the background sound level, depending on the context.

BS4142:2014 notes that: "Adverse impacts include, but are not limited to, annoyance and sleep and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."

BS4142: 2014 outlines guidance for the construction of the context of the potential impact including consideration of the existing residual sound levels, location and/or absolute sound levels.

11.2.2 Baseline Noise Environment

The main sources of noise in this area are (a) road traffic (b) agricultural operations and (c) aircraft traffic (usually helicopter training). The agricultural traffic peaks during the harvest period (between May and October). During the harvest period it is common for movements of agricultural traffic to occur between the hours of 2300 and 0700.

The noise climate in the area surrounding Domgay Hall is deemed to be typical of a rural area. The principal noise sources include road traffic noise, which is influenced by reasonably high levels of HGV's associated with local agricultural activities, as well as operational noise from the field work.

11.2.3 Impact Assessment Methodology

Construction Noise

TAN11 provides detailed guidance on the introduction of noise sources into a noise-sensitive area, and gives recommendations that BS5228 should apply to noise from construction sites and to industrial operations.

BS5228 provides guidance relating to the prediction and control of noise and vibration from open sites where noise from fixed plant and mobile plant has the potential to be an issue with regards to the potential disturbance of residents. In particular, this document provides guidance that is relevant to this noise assessment relating to:

- noise and vibration, and its potential for affecting neighbours of open sites;
- the prediction of environmental noise levels associated with fixed and mobile plant;
- criteria for setting noise control targets;
- the control of noise emissions from open sites; and
- the calculation of noise levels associated with plant which does not operate continuously.

Additionally, this document includes reference noise level data for various types of plant commonly associated with activities on construction sites. Noise and vibration levels generated by construction activities are regulated by guidelines and subject to local authority control. Guidance is contained within BS5228 but no fixed limits are suggested in the document.

Operational Noise

The impact of noise from a new source may be determined by comparing the noise level of the source with recommended, absolute noise limits contained within guidance documents. The relevant document in this instance is the World Health Organisation Guidelines.

The use of fixed limits is appropriate for the assessment of sources that are contained within a finite boundary, particularly where noise sensitive receptors are few or are grouped together. Thus, this assessment method is appropriate to the noise from site activity, such as that within the buildings, the fans and vehicle movements on the service pad to the front of the buildings.

There are a number of guidance documents that contain recommended fixed limits. These are discussed below.

TAN11 contains comprehensive advice on the subject of noise both in the circumstances of a residential development or a noise producing development.

The subject of commercial and industrial development, in this section, reference is made to BS 8233:1987 (now superseded by BS 8233:1999).

This Standard is principally intended to assist in the design of new dwellings; however, the Standard does state that it may be used in the assessment of noise from new sources being brought to existing dwellings.

The BS 8233:1999 limits may be summarised as follows:

Gardens	$L_{Aeq,16hr}$	= 50 to 55 dB
Living rooms (internal)	$L_{Aeq,16hr}$	= 30 to 40 dB
Bedrooms (internal)	$L_{Aeq,8hr}$	= 30 to 35 dB
Bedrooms (internal)	L_{Amax}	= 45 dB

BS 8233:1999 was based on the advice contained in a draft of World Health Organisation document "Guidelines for community noise". This document was released in final form in 2000.

The WHO advice is the most useful, comprehensive, and pertinent advice in this case, because it is not specific to the circumstances of the assessment. Instead, it provides guideline values at, for example, schools, dwellings and offices.

The WHO guideline values, set, are appropriate to what are termed "critical health effects". This means that the limits are at the lowest noise level that would result in any psychological, physiological or sociological effect.

It is important to appreciate that the WHO guideline values are very stringent and are not indicative of significant impact. Instead, a report compiled by the National Physical Laboratory for the DETR concluded that noise levels below the WHO guideline values indicate "negligible effects" and significant effects may not occur until much higher values are reached.

In this respect, the WHO values are much more robust than the national planning policy objective, this being to "avoid demonstrable [i.e. real] harm to interests of acknowledged importance" (ref TAN 11).

The WHO guideline values may be summarised as follows:

Day	External	$L_{Aeq,16hr}$	= 50-55 dB
	Internal	$L_{Aeq,16hr}$	= 35 dB
Night	External	$L_{Aeq,8hr}$	= 45 dB
		L_{Amax}	= 60 dB

Internal	$L_{Aeq,8hr}$	= 30 dB
	L_{Amax}	= 45 dB

These criteria have been used in this case for the assessment of noise impact from site activity: ventilation fans, movements on the service pad. However, because some of these activities will vary widely, over the 16 hour day period or 8 hour night period, the L_{AeqT} index has been normalised over a peak 1 hour period in order to ensure that a robust assessment is undertaken.

Operational Traffic Noise and Vibration

There is also potential for noise from vehicles associated with the poultry installation facility to impact upon sensitive receptors along the roads on which they travel. The noise levels, with and without the poultry installation, have been calculated using the methodology in 'Calculation of Road Traffic Noise' CRTN. The level of any change has been used to assess the impact of noise and vibration generated by operational traffic on local sensitive receptors.

11.2.4 Assessment Criteria

The impact magnitude and significance has been defined using the criteria in Table 29 and Table 30 below. These criteria have been developed for use in this assessment based on the guidance set out in the draft 'Guidelines for Noise Impact Assessment' (IEMA/IOA, 2002).

Table 29: Magnitude Criteria

	Impact Magnitude			
Subject Area	Major	Moderate	Minor	Negligible
Nearby residents from construction/ decommissioning of proposed development	Noise levels normally over 75dB(A)	Noise levels normally 65-75dB(A)	Noise levels normally 56 – 65 dB(A)	Noise levels normally less than 55 dB(A)
Nearby residents from operational noise	Noise Rating Level >10 dB(A) above Background Noise Level	Noise Rating Level equal to or above Background Noise Level (up to 10 dB(A)	Noise Rating Level up to 10 dB(A) below Background Noise Level	Noise Rating Level > 10 dB(A) below Background Noise Level
Nearby residents from traffic noise and vibration	Change in noise level of more than 10dB(A)	Changes in traffic noise levels between 3 and 10 dB(a)	Change in traffic noise levels between 1 and 3 dB(A)	Changes in traffic noise levels of less than 1dB(A)

Table 30: Significance Criteria

	Impact Significance	
Subject Area	Significant	Not Significant
Nearby residents from construction of development	Long term (more than a few days) major or moderate impacts	Minor or Negligible Impact
Nearby residents from operational noise	Major or moderate impact	Minor or Negligible impact
Nearby residents from traffic noise and vibration	Major or moderate impact	Minor or negligible impact

11.2.5 Limitations of the Assessment

As mentioned above, construction details to be used are not currently available to accurately estimate actual noise emissions from the facility. Nevertheless worst case assumptions are utilised regarding emissions such that the following assessment is robust.

11.3 Baseline Position

11.3.1 Noise Monitoring Results

In rural areas, background levels may be between 38 - 42 dB adjacent to an existing farm this figure is likely to be towards 42 dB figure if not in excess of this.

11.3.2 Incorporated Mitigation

As part of the assessment the following has been assumed in terms of the features of the basic design and operation of the poultry installation which assist in reducing noise emissions:

- Housing of most noise sources within buildings;
- Siting of buildings so that noise emitting areas face away from residential areas;
- Insulation of buildings and using double glazed windows;
- Using noise baffles areas around ventilation fans; and
- Restriction of vehicle movements other than those associated with bird removals to less sensitive periods (deliveries will take place between 07:00 and 21:00 on weekdays, 07:00 and 17:00 Saturdays and 09:00 and 17:00 on Sundays and Bank Holidays).

11.4 Assessment of Impacts

The details of the development are included in Chapter 4. The following elements of the proposal are considered to be noise emitting sources:

11.4.1 Ventilation Fans:

The following ventilation fans are to be fitted to the proposed buildings:

10	x	10" x 52" inlets in each gable end per shed
6	x	800mm extraction fans in roof per shed

It is not possible to calculate in-situ noise outputs of the ventilation fans therefore comparable noise measurements have been used to calculate worst case noise power output. Noise monitoring data detailing noise emissions from a poultry unit with high velocity ridge mounted fans has been used. This represents a worst case as ridge mounted ventilation systems have a greater noise power output than tunnel ventilation systems as they are not enclosed within noise baffle areas. The sound power level of a building with 24 ridge mounted extractor fans was measured as 36.7dBA.

In order to calculate the overall level of the fans the following calculation has been used: $L_2 = L_1 + 10 \log N$

Where L2 = overall level for N number of sources
L1 = the measured level of an individual noise source
N = number of similar sources

Therefore the overall noise level for the roof fans will be 42.7 dBA.

There will be incorporated mitigation into the design of the buildings. The fans are enclosed within a treated plenum chamber which will be 3050 in depth and are fitted with a 200 mm insulated roof and 100 mm insulated walls as per the sheds. They will exhaust into an insulated baffle area which will be located 4600 mm from the fans themselves. The baffles will be insulated with 100 mm insulated sheets. The attenuation offered by screens / barriers is a very complex problem but according to BS 5228: Part1: 2009 Section F.2.2.2.1 Section C an attenuation to the noise will vary between 5 and 10 dBA – as a worst case is assumed it is expected that the noise output is attenuated by 5dBA. It is thereby estimated that noise levels due to the ventilation fans will be 0.4 dBA at the nearest sensitive receptor after subtracting distance decay; this amounts to at least 10dBA under all of the measured background noise levels for the area during both day and night.

11.4.2 Internal Conditions

The sound from birds within the buildings will be transmitted to outdoors through the series of ventilation apertures in the elevations facing the receptors. The sound insulation of the composite material of which the buildings will be constructed is 25 dBA. The presence of ventilation apertures of overall area 1% of the elevation gives an indoors to outdoors sound reduction of 20 dBA. Measured interior sound levels of comparable bird accommodation are no higher than 67dBA. It is thereby estimated at 47 dBA immediately outside the buildings and 4.72dBA LAeq at 130 metres from the development), after subtracting distance decay; this amounts to at least 10dBA under all of the measured background noise levels for the area during both day and night.

11.4.3 Vehicle Movements on Site

There will be three main categories of movement on site: first, movements of feed HGVs delivering feed; second, movements of tractors and trailers removing manure; and third, collections / delivery of birds. The three categories will not occur simultaneously.

There will normally be no more than one delivery of feed in any 24 hour period. Unloading of the feed would take approximately 30 minutes. Measured noise levels of delivery vehicles arriving and unloading fluctuate between 66 and 75dB (applicable at 3 metres) and is broken down between arrival (2.5 minutes) at 69dB, blowing off feed (30 minutes) at 66dB and departure (0.5 minutes) at 75dB. Deliveries and collections of birds in will have similar noise outputs.

Tractors and trailers removing manure will be loaded by a loader scraping manure from within the building. One loader will operate continuously scraping the buildings, the tractor and trailer will park with the trailer within the building. Two tractor and trailer units will serve the loader. When not in use all engines will be switched off i.e. when the trailers are being loaded or when the second trailer is waiting to be loaded. Manure will not be removed from the buildings between the hours of 2300 and 0700; manure removal will take place from 0700 to 2100 each day during clearout (fourteen hours). The noise levels of the tractor scraping the sheds and the tractors carting manure will have a similar measured level as the delivery vehicles, therefore the $L_{Aeq\ (14h)r}$ at the garden edge of the closest sensitive receptor would be significantly more than 10 dB(A) below Background noise levels.

11.4.4 Traffic Noise and Vibration

From measurements of delivery vehicle pass-bys at speeds typical for those found on roads such as this, a delivery type vehicle is indicated as generating an L_{Amax} = 75 dB at 3 metres.

To enable an assessment to be made over a period of time, the Single Event Noise level (SEL) for each vehicular movement must be established. In practice this is limited to the time during which the actual noise is within 10 dB(A) of the maximum and may be approximated from:

$$SEL = L_{Amax} + \Delta_A$$

Where

$$\Delta_A = 10 \log (((t2 - t1)/2)tref)$$

And

t_1 and t_2 are the 10 dB down points of a vehicle drive-by and t_{ref} is one second. (Source - The Noise Council = "A guide to measurement and prediction of the Equivalent Continuous Sound Level").

The 10 dB down points can be calculated on the basis of vehicle speed and the attenuation with distance that would be experienced as a vehicle approaches and departs the reception point. For the vehicle speed of 32kph (20mph), Δ_A = 5 dB and the resulting SEL is 80 dB(A) at 3 metres.

The $L_{Aeq,T}$ can now be calculated from the equation:

$L_{Aeq,T}$ = SEL + 10 log n - 10 log T - 10 log $d_1/3$ – screening - 10 log (angle of view/180)

where

n = number of events in the time period
T = number of seconds in the time period
D_1 = distance from centre line of road to receiver
angle of view = angle of view of the access road

There could be a maximum of 14 movements associated with depletion of the crop during 0700 and 2300.

HGVs collecting birds may collect birds during the recognised night time hours of 2300 to 0700. The Design Manual for Roads and Bridges States that:

> *"Research has been conducted into the relationship between sleep disturbance, as reported in social surveys, and noise exposure, as measured or predicted by acousticians. There tends to be a rather poor correlation between reported awakenings and recorded intrusive events and, similarly, rather poor correlations between reported sleep quality and observed behaviour such as awakening or changes in sleep stage patterns. Measurements of noise from roads in Britain and Germany both show that night-time traffic noise (ie, noise between 10pm and 6am on the following day) is on average 10 dB(A) less than daytime levels (Railway Noise and the Insulation of Dwellings, DoT, 1991).*
>
> *In 1982 Rice and Morgan produced a comprehensive synthesis of field and laboratory studies and suggested that sleep disturbance could be significant at quite low noise levels. In 1992, the Department of Transport completed a major study into aircraft noise and sleep disturbance. This study was based on collecting objective data on how people slept in their own homes under normal circumstances. This was done by using actimeters, a wrist-watch sized computer that is put on at night to measure limb movements (which correlate well with sleep disturbance). Data were collected on 400 subjects for 15 nights each. This was the largest set of such data ever collected.*
>
> *Aircraft noise has many characteristics similar to traffic noise at night. Movements by aircraft tend to occur at irregular intervals and the level of activity is far below normal daytime levels. The main findings of this study were that, once asleep, very few people living near airports are at risk of any substantial sleep disturbance due to aircraft noise, even at the highest event noise levels above100 dB(A). At outdoor peak noise levels below 80dB(a), average sleep disturbance rates are unlikely to be affected by aircraft noise. At higher levels, and most of the noise data on which the conclusions were based were in the range 80-95 dB(A) L max, the chance of the average person being awakened is about 1 in 75. Compared with the overall average of about 18 nightly awakenings from other causes, this probability indicates that even large numbers of noisy night time aircraft movements will cause very little increase in the average person's night awakenings. Therefore, based on expert opinion on the consequences of sleep disturbance, the results of this study provide no evidence to suggest that aircraft noise is likely to cause harmful after effects. (Report of a Field Study of Aircraft Noise and Sleep Disturbance, DoT 1991)"*

If the results of this study are broadly valid for road traffic then it would suggest that the risk if sleep disturbance from traffic noise at night is very small, and certainly well below the levels suggested by previous studies or analysis.

11.4.5 Construction Noise

The exact construction process will be determined by the successful contractor. It is therefore not possible to accurately calculate the likely noise and vibration levels during construction which would enable its impact to be fully ascertained.

It is considered unlikely that noise from traffic associated with the construction of the development will generate a significant impact. This is because HGV traffic levels associated with the construction phase of the development are predicted to be lower than the operational phase and will not be during night time hours. In addition, although there are likely to be additional care movements generated by construction workers travelling to and from the site, these movements are insignificant when compared to existing traffic levels and will have a minimal effect on a very small number of sensitive receptors.

11.4.6 Decommissioning

Noise from decommissioning would be similar to noise during the construction phase. As such, it is proposed that the noise controls will be put into place to ensure that the impact from decommissioning will not be Significant.

11.5 Mitigation

11.5.1 Decommissioning

In order to ensure that noise disturbance is minimised, the following noise mitigation measures shall be incorporated during the decommissioning phases and implemented at all times:

- Good maintenance of plant to ensure that excessive noise and vibration levels are not generated;
- Limiting hours of delivery to avoid sensitive periods;
- Regular integrity checks of noise mitigation measures fitted to items of plant. Such measures are likely to include silencers and engine covers. Where repair or replacement is required, the plant will, where possible, be taken out of service until repair or replacement of parts has been undertaken;
- If plant or machinery is found to be generating excessive noise, unless bird welfare is at stake, the poultry installation will be taken out of service until repairs can be undertaken to reduce noise levels generated;
- Plant should be switched off when not in use; and,
- High revving of engines will be minimised.

11.5.2 Operation

Noise limits for components of the poultry installation will be set to ensure that background (LA90) noise levels are not exceeded. The following noise mitigation measures will be incorporated into the detailed design to ensure that operational noise impacts from the poultry installation are minimised:

- The adoption of the noise management plan attached to Appendix 15.
- Use of modern ventilation fans.
- Regular maintenance and repair or replacement of noisy equipment.
- Restriction of all vehicle movements other than bird removals outside the hours of 2300 and 0700.
- Insulation of sheds and provision of double glazing.
- Incorporating a noise baffle and fan canopy surrounding the ventilation fans.

11.6 Residual Impacts and Conclusions

A noise assessment of the poultry installation at Domgay Hall has been undertaken. Estimations have been used to construct a worst-case noise model of the likely effects of plant and noise. This data has shown that noise levels are predicted to be below existing background noise levels at all receptors. It is also predicted that with incorporated management controls the residual noise during the operational and decommissioning stages will not be significant. This impact of this level of change will not be significant. The impact of changes in vibration levels are closely related to the impact of changes in traffic noise levels. As such, the impact of changes in traffic vibration levels will also be minor or negligible and not significant. Added to this complaints analyses carried out suggest that significant adverse impacts on local amenity as a result of noise release from the onsite plant or HGV movements from poultry installation are unlikely.

CHAPTER 12 – WATER RESOURCES

12. Water Resources

This chapter deals with the potential impacts of the Poultry Installation on water resources including surface waters, groundwater and flood risk. The main risks identified with the proposal were the risks of pollution of groundwater and surface water from nitrates from spreading and removal of manure and dirty water, the increased in surface water runoff from the site. With the appropriate best practice mitigation in place (including the use of Sustainable Drainage Systems (SuDs) all risks are reduced to minor or less.

12.1 Introduction

This chapter forms part of the overall Environmental Statement (ES), which has been prepared to accompany the detailed planning application for the proposed poultry development at Domgay Hall.

The chapter assesses the potential significant hydrogeological and hydrological impacts of the poultry installation. The assessment is based primarily on a desk-based survey of the existing hydrogeological and hydrological conditions within the area, using information from published sources and specific investigations. The sensitivity of receptors and magnitude of impacts are assessed and combined to determine the significance of each impact. Mitigation measures and the nature of any residual risks, post-mitigation are also discussed.

12.1.1 Overview of Potential Impacts on Surface and Groundwater

The potential hydrological and/or hydrogeological impacts of the poultry installation relate to three main issues: nutrient pollution events through spreading of manure; chemical/effluent pollution events from on site; and alteration/interruption of surface and/or groundwater flows as set out below.

12.1.2 Nutrient pollution from spreading

The risks relate to the possibility of applying too much nitrogen or of raising soil phosphorus levels above recommended limits.

12.1.3 Chemical / Effluent Pollution

Oil / fuel / chemical pollution (e.g. from incorrect storage, containment, accidental spillage and malfunction of dirty water system) could affect aquatic ecology and could also impact on the quality of water abstracted from both surface and groundwater for drinking supply.

12.1.4 Alteration / Interruption to Flow

Any alteration of natural drainage patterns could disturb natural surface and subsurface water flows to either water dependent habitats or water supply abstraction points. Concrete hardstanding areas, buildings and bunds could provide new preferential pathways or prevent water ingress into soils and interfere with the retention of flows within catchments. Alteration of surface runoff due to increased areas of hardstanding could potentially cause flooding to receptors downstream of the site.

12.1.5 Summary of Potential Impacts

Table 31 provides a summary of the potential impacts that could occur as a result of the poultry installation.

Although a number of potential impacts are identified in Table 31 it does not necessarily follow that they would actually occur.

Table 31: Potential Impacts Resulting from Development Activities

Key Activities	Specific Element / Activity	Potential Effect	Potential Sensitive Receptors
Construction	Use of vehicles / machinery during construction	Increase of surface run off due to compaction of soil	Surface water hydrology. Impacts on water flow which may lead to potential damage and or flooding
	Materials Management	Leakages of chemicals to ground	Principal aquifer groundwater abstractions and nearby rivers via baseflow, aquatic species / ecological systems
Operation	General Operations	Leakage of chemicals etc	Principal Aquifer, groundwater abstractions and nearby rivers via baseflow, aquatic species / ecological systems
	Building wash-down	Leakage of dirty water	Principal Aquifer, groundwater abstractions and nearby rivers via baseflow, aquatic species / ecological systems
	Application of manure to land	Nutrient concentrations exceed recommended limits	Principal Aquifer groundwater abstractions and nearby rivers via baseflow, aquatic species / ecological systems
	Use of vehicles	Spillage of Fuel	Principal Aquifer groundwater abstractions and nearby rivers via baseflow, aquatic species / ecological systems
	Presence of Hard Surfaces	Alteration to run-off flows	Flood risk, effects on catchments and river flows.
Decommissioning	Use of vehicles / machinery during demolition	Increase in surface run-off due to compaction of soil.	Surface water hydrology / channel morphology. Impacts on water flow regime which may lead to potential damage and flooding.
	Materials management	Leakage of contaminants to ground	Principal Aquifer groundwater abstractions and nearby rivers via baseflow, aquatic species / ecological systems

12.2 Legislation Planning Policy and other Guidance

12.2.1 Legislation

Guidance provided from the UK Technical Advisory Group (UKTAG) provides an overview of the environmental standards for water quality and hydromorphology arising from requirements set by the European Water Framework Directive (WFD). Consideration is given to these environmental standards throughout this assessment. – the Water Environment (Water Framework Directive) (England & Wales) Regulations 2017.

The Nitrate Pollution Prevention Regulations 2015 regulate the use of organic and inorganic fertilisers within Nitrate Vulnerable Zones.

12.2.2 Planning Policy

The planning policy framework in the context of this development comprises the national Technical Advice Notes (TAN's) and local plans. The TAN that particularly relates to water issues is Technical Advice Note 15 – Development and Flood Risk (2004).

12.2.3 Guidance

With regard to hydrology, management of water-borne pollution and protection of ecologically sensitive areas, the Environment Agency (EA) has a statutory obligation to manage and control the pollution of water resources. Accordingly, it is reasonable to assume that the adoption of NRW's Best

Practice Guidelines and licensing of the poultry installation under Environmental Permitting Regulations will prevent pollution to recognised standards and make any 'significant' impacts unlikely.

The NRW's "How to comply with your environmental permit for intensive farming" (EPR 6.09) is the principal document used for guidance on preventing the contamination of surface waters from construction activities.

Relevant guidance includes:

- Guidance on the Groundwater Regulations 1998 (DEFRA);
- The Control of Pollution (Oil Storage) Regulations 2001;
- Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors C532 (CIRIA);
- Environmental Good Practice on Site C650 (CIRIA);
- Culvert Design Guide C168 (CIRIA);
- Sustainable Drainage Systems. Hydraulic, Structural and Water Quality Advice C609 (CIRIA);
- Sustainable Water Management in Landuse Planning C630 (CIRIA); and
- Control of Water Pollution from Linear Construction Projects: Technical Guidance C649 (CIRIA).

Guidance regarding the application of manure to agricultural land is regulated by the Nitrate Pollution Prevention Regulations 2015. A number of guidance notes in the *Guidance for Farmers in NVZs* series produced by Defra relate to the practical application of manure to the land. Where land is outside the NVZ there are no specific legal requirements, however the Code of Good Agricultural Practice for the protection of Water, Soil and Air should be referred to.

12.3 Methodology

12.3.1 Desk Study

The assessment predominantly entailed a desk study involving collation and assessment of the relevant information from the following sources:

- Ordnance Survey (OS) Landranger Map at 1: 50,000 scale
- Groundwater Vulnerability Map 1: 100,000
- Landmark Envirocheck Report on surface water and groundwater

12.3.2 Manure Management Plan

To assess the risks associated with the storage requirements a Farm Waste Management Plan has been produced. The plan has been produced with reference to Guidance notes for the application of manure to agricultural land and includes a risk assessment (Appendix 16).

12.3.3 Assessment Criteria (Contamination and General Risks)

The significance of any impacts of the poultry development on baseline conditions is assessed as part of the impact assessment. The sensitivity of the receptor and the magnitude of potential impact combine to determine the significance of that impact. Magnitude, sensitivity and significance criteria were developed for the conditions and environments prevailing at the site.

Magnitude

The criteria used to determine the magnitude of a potential impact are defined in Table 33. Assessment of magnitude includes consideration of the amount and intensity of disturbance and duration (i.e. whether permanent or temporary). In this assessment, consideration of likelihood is incorporated into a final risk based assessment (see below).

Table 33: Impact Magnitude Criteria

Magnitude	Definition
Negligible	Unquantifiable or unqualifiable change in hydrological/hydrogeological conditions (including water quality).
Minor	Detectable but minor change to hydrological/hydrogeological conditions. Water quality/quantity standards less than threshold and unlikely to affect most sensitive receptors.
Moderate	Detectable change to hydrological/hydrogeological conditions resulting in non-fundamental temporary or permanent consequential changes. Some deterioration in water quality/quantity likely to temporarily affect most sensitive receptors.
High	Fundamental change to hydrological/hydrogeological conditions (including deterioration in water quality/quantity) resulting in temporary or permanent consequential changes.

Sensitivity

Sensitivity criteria can be based both on the degree of environmental response to any particular impact, as well as the 'value' of the receptor (e.g. an Aquifer or nearby abstraction borehole should be considered more sensitive to any impact than a non-aquifer). The sensitivity criteria developed for this assessment are presented in Table 34.

Table 34: Sensitivity Criteria

Sensitivity	Definition
Negligible	Environment is insensitive to impact, no discernible changes e.g. non-aquifer where little or no effect on groundwater could occur.
Low	Environment responds in minimal way such that only minor changes are detectable e.g. surface water features present at some distance or groundwater resource with minimal sensitivity e.g. Minor Aquifer.
Medium	Environment clearly responds to effects in quantifiable and / or qualifiable manner e.g. reasonable proximity to a surface water course abstraction point, or Major Aquifer or sited on a Minor Aquifer.
High	Environment is subject to major change due to impact e.g. adjacent to or within 100m of a sensitive watercourse or sited directly upon a Major Aquifer / Source Protection Zone (SPZ).

Significance

The combination of magnitude and sensitivity logically combine to provide a matrix categorisation of significance. Significance levels are presented in Table 35.

Table 35: Significance Matrix

		Sensitivity			
		Negligible	Low	Medium	High
Magnitude	Negligible	Insignificant	Insignificant	Insignificant	Insignificant
	Minor	Insignificant	Minor	Minor	Moderate
	Moderate	Insignificant	Minor	Moderate	High
	High	Insignificant	Moderate	High	Very High

Qualitative Risk Assessment Methodology

Risk assessment is the process of collating known information on a hazard or set of hazards in order to estimate actual or potential risks to receptors. The receptors may be human health, a water resource, a sensitive local ecosystem or even future construction materials. Receptors can be connected with the hazard under consideration via one or several exposure pathways (e.g. the pathway of direct contact or transport via run-off). Risks are generally managed by isolating or removing the hazard, isolating the receptor, or by intercepting the exposure pathway. Without the three essential

components of a source (hazard), pathway and receptor, there can be no risk. Therefore, the presence of a hazard at a site does not necessarily mean that there will be attendant risks.

Sources

Potential sources of contamination have been identified for the Domgay Hall site, based on a review of the proposed site uses, potential spillages from construction plant or operational chemical/waste storage etc). The nature, and the likely extent, of any contamination have also been considered, e.g. whether such contamination is likely to be localised or widespread.

Receptors

The varying effects that a hazard has on individual receptors are dependent largely on the sensitivity of the receptor. Receptors include any people, animal or plant populations, or natural or economic resources that are within the range of the potential spread of the source, and which are connected to the source by a transport pathway. Although in this instance the assessment is principally concerned with surface water and groundwater receptors.

Pathways

The mere presence of contamination does not infer a risk. The exposure pathway determines the dose delivered to the receptor and the effective dose determines the extent of the adverse impact on the receptor. A pathway which transports the contaminants to the receptor, generally involves conveyance via soil, water or air, or, in some cases, direct contact.

Exposure Assessment

By considering the source, pathway and receptor, an assessment has been made for each contaminant type, on a receptor by receptor basis, with reference to the significance and degree of risk. In assessing this information, a judgement has been made as to whether the source contamination can reach a receptor, and whether it is of a major or minor significance. The exposure risks are assessed against the present Domgay Hall site conditions (i.e. the 'Do Nothing Scenario').

The assessment of risk that is presented within this report is based upon the procedure outlined in the Department for the Environment Transport and the Regions' (DETR) Circular 02/2000. In addition, the DETR (now Defra), with the EA and the Institute of Environment and Health, has published guidance on risk assessment (Guidelines for Environmental Risk Assessment and Management). This guidance states that the designation of risk is based upon a consideration of both:

- The likelihood of an event; (takes into account both the presence of the hazard and receptor and the integrity of the pathway); and,
- The severity of the potential significance (takes into account both the potential severity of the hazard and the sensitivity of the receptor).

Table 36 shows how the risk rating is achieved by combining the likelihood of the event and the degree of significance.

Table 36: Risk Assessment Matrix

		Significance			
		Insignificant	Minor	Moderate	High
Likelihood	Unlikely	Very Low Risk	Very Low Risk	Low Risk	Moderate / Low risk
	Low Likelihood	Very Low Risk	Low Risk	Moderate / low risk	Moderate risk
	Likely	Low risk	Moderate / Low risk	Moderate risk	High risk

	Significance			
High Likelihood	Low risk	Moderate risk	High risk	Very high risk

Under such a classification system the following categorisation of risk has been developed and the terminology adopted as shown in Table 37.

Table 37: Risk Criteria

Term	Description
Very low risk	The presence of an identified hazard does not give rise to the potential to cause significant harm to a designated receptor.
Low risk	It is possible that harm could arise to a designated receptor from an identified hazard but it is likely that, at worst, this harm if realized would normally be minor.
Moderate risk	It is possible that, without appropriate remedial action, harm could arise to a designated receptor, but it is relatively unlikely that any such harm would be high, and if any harm were to occur it is more likely that such harm would be relatively minor.
High risk	Harm is likely to arise to a designated receptor from an identified hazard at the site without appropriate remedial action.
Very High Risk	There is a high likelihood that severe harm could arise to a designated receptor from an identified hazard at the site without appropriate remedial action.

The assessment of likely significant impacts of the poultry installation, both from the site and outside the site, is initially based on potential impact before mitigation. Levels of assessed impact which are moderate or above will require mitigation/management to reduce the level of impact to negligible or low levels.

12.3.4 Assessment Criteria (Flood Risk and Drainage)

It is recommended by NRW, the Department for the Environment, Food and Rural Affairs (DEFRA) and the Welsh Assembly Government that the primary assessment tool within a flood risk assessment should be the sequential test as set out in Technical Advice Note 15 Development and Flood Risk (2004). Such an assessment, however, deals almost exclusively with the risks associated with tidal and fluvial sources and not the full range of flooding sources. In addition to this, the sequential test does not provide guidance for assessing the impact of mitigation and residual risk subsequent to development.

Therefore in order to allow for the wider assessment of flood risk the following more generalised assessment methodology has been developed. It should be noted that where applied to fluvial and tidal sources the results of the assessment should be cross checked against the results of the sequential test.

Assessment Methodology

In line with guidance set out in Technical Advice Note 15 the key to the classification is that the designation of significance (or risk) is based upon the consideration of:

- The sensitivity of the receptor – takes into account the nature of the development or receptor and its likely response to increased risk;
- The magnitude of the potential hazard (i.e. severity) – takes into account the potential severity and nature of the flooding; and
- The probability of occurrence (i.e. likelihood) – takes into account the anticipated frequency of occurrence but also considers both the presence of the hazard and receptor, and the integrity of the pathway.

Sensitivity

When considering off-site impacts there is a general assumption that all developments are highly sensitive. The assumption can, however, typically be relaxed when considering 'Water Compatible'

development or undeveloped land. Given this the sensitivity of the receptor is ranked as shown in *Table 38* below:

Table 38: Classification of Sensitivity of Receptor

Sensitivity of Receptor	New Development	Off site
Very Low	Flood Attenuation Features	-
Low	Water Compatible* developments	-
Moderate	Less Vulnerable* developments	Undeveloped Land
High	More Vulnerable* developments	Other access routes
Very High	Highly Vulnerable* developments	All built development unless mitigating circumstances exist. Key access routes

Magnitude

To classify the magnitude of the potential effects it is necessary to look at the nature and scale of the individual impacts. These include, but are not confined to, the extent of flooding, the depth of flooding, the duration of flooding and the velocity of flood waters. For new developments the assessment is based on the likely post-development situation, for off-site receptors it is based solely on these receptors' likely deterioration.

Given this the magnitude of the potential effect is then ranked as shown below in Table 39.

Table 39: Matrix for Determining the Significance of the Potential Effect

Magnitude of Hazard	New Development	Off Site
Negligible	No potential for flooding, or no identifiable impact of flooding	No likely increase in flood severity at any off site location
Very Low	Planned or permitted flooding that does not adversely impact the built development	-
Low	All of the following criteria achieved: Flood depths below 0.3m, Likely flood duration below one hour Flood proofing measures planned	Likely but unquantifiable small increases of flood depths, durations, flow velocities or extent
Medium	Any one of the following criteria achieved: Flood depths between 0.3m and 1m, Flood flow velocity greater than 0.15m/s Likely flood duration in excess of 1 hour Any restrictions to access and egress	Any other measurable increase of flood depths, durations, flow velocities or extent
High	Any of the following criteria achieved: Flood depths greater than 1m, Flood flow velocities greater than 0.45m/s Likely flood duration in excess of 24 hours	Any marked increase (>10%) increase in flood depth, flood flow velocity or flood duration. Any change in flood extent that impacts additional properties including access

Classification of Probability of Occurrence

To classify the probability of occurrence for a potential effect, it is necessary to understand how regularly a given event or outcome is likely to occur. This can be assessed in a number of ways including assessments based on historical data, quantitative analysis, or experience from other similar sites. Often this assessment will be based on standard guidance. The probability of the potential effect is then ranked as shown below in Table 40.

Table 40: Classification of Probability of Occurrence

Probability of Occurrence	Potential Effect
Very Low	It is unlikely that any consequence will ever arise.
Low	It is unlikely that any consequence would arise within the lifetime of the development. Equivalent to an annual probability of less than 0.1% or Flood Zone 1*

Probability of Occurrence	Potential Effect
Medium	Circumstances are such that an event is possible in the medium term and likely over the long term, although not necessarily inevitable. Equivalent to an annual probability between 0.1 and 1% (0.1 and 0.5% for tidal) or Flood Zone 2*.
High	Any consequence would appear likely in the medium term and inevitable in the long term (lifetime of the development). Equivalent to an annual probability of flooding of greater than 1% (0,5% for tidal) or Flood Zone 3*.

Risk Assessment

Once the magnitude of the potential effect and likelihood of occurrence have been assessed these are then combined using a risk matrix (41) to assess the flood risk of each potential effect.

Table 41: Risk Matrix

		Likelihood of Occurrence			
		Very Low	Low	Medium	High
Magnitude of Potential Effect	Negligible	Negligible	Negligible	Negligible	Negligible
	Very Low	Negligible	Very Low	Low	Low
	Low	Very Low	Low	Low	Moderate
	Moderate	Low	Low	Moderate	High
	High	Low	Moderate	High	High

Typically flood risks assessed as low, or less, are considered acceptable. If the assessment results in moderate or high risk, additional mitigation measure will be required to facilitate development.

In some situations the risk assessment procedure will result in an artificially low assessment of risk. This is particularly the case in situations where consequences of very rare flooding (i.e. breech scenarios) are so extreme that any residual risk, however low, should not be allowed. In such instances the assessed risk should be elevated. Such decisions must always be accompanied by detailed justification.

12.4 The Receiving Environment and Sensitive Receptors

12.4.1 Geographical Context

The site is located at Domgay Hall in a rural area.

12.4.2 Surface Hydrology

The River Vrynwy runs to the North of the site.

12.4.3 Mains Supply and Drainage

No mains supply pipes are currently within the Domgay Hall site.

Mains Supply

Currently a mains supply services the farmhouse.

Surface Water Drains & Sewers

Surface water from the existing building is directed into the ditch. There are no other surface water drains on the site.

Foul Sewers

There is no foul sewer connection in the vicinity to the site.

12.4.4 Geology

The geology of the area surrounding the site consists of freely draining floodplain soils.

12.4.5 Hydrogeology

The site is not located within a designated Nitrate Vulnerable Zone (NVZ) under the Nitrates Directive.

12.4.6 Flood Risk

The site is not located within NRW classified Flood Zone 1 and is not at risk of extreme flooding, from major sources, with an annual probability of flooding from rivers or the sea of 0.1%. Due to the site being in excess of 1ha it has been necessary to prepare a Flood Risk Assessment for this site (see below).

TAN 15 defines the flood zones as: -

Zone A – Considered to be at little or no risk of fluvial or tidal/coastal flooding;

Zone B - Areas known to have been flooded in the past evidenced by sedimentary deposits;

Zone C – Based on Environment Agency extreme flood outline, equal to or greater than 0.1% (river, tidal or coastal);

Zone C1 - Areas of the floodplain which are developed and served by significant infrastructure, including flood defences; and

Zone C2 – Areas of the floodplain without significant flood defence infrastructure.

The flood zones are based on annual probabilities of flooding. It is unlikely, but possible, that a flood with, for example, an annual probability of 1% will occur two years running. The flood zones show the flooding that would occur to land without the presence of flood defences.

12.4.7 Designated Sites

No water dependent nationally designated sites are located within 1km of the site.

12.5 Predicted Impact and Evaluation of Significance (Contamination and General Risks)

12.5.1 Assessment of Potential Impacts and Risk Basis for Assessment

The impact assessment has been undertaken according to the following basis regarding the nature and extent of the development:

- The development will house approximately 40,000 birds at any one time
- Uses of the individual hardstanding areas may include chemical storage.

12.5.2 Sources, Pathways & Receptors

A variety of sources, pathways and receptors have been identified as outlined below. These are generally associated with the release of chemicals, oils and fuels and dirty wash water.

Sources

- Site development – storage and use of chemicals, fuels and oils, and concrete and sediment/silt associated with construction; and

- Accidental release of dirty wash water or chemicals delivered to, and stored at, the site entering watercourses; and

Pathways

- Seepage of chemicals to groundwater through permeable ground; and
- Any chemicals/oils which seep into groundwater migrating via baseflow to nearby surface water courses;

Receptors

Receptors that would be sensitive to changes in the hydrological regime on the Domgay Hall site and within the surrounding area include:

- Surface water – River Vrynwy and local drainage and associated ponds.
- Groundwater – Shallow groundwater
- Public and private water supplies.

Impacts

The principal potential impacts are therefore considered to be as follows:

- Pollution of surface water by oil, fuel or chemicals during construction and decommissioning;
- Pollution of groundwater by oil, fuel or chemicals during construction and decommissioning;
- Pollution of surface water and groundwater water abstractions by chemicals or dirty wash water associated with operations;
- Obstruction of surface water courses causing flow alteration.

Potential impacts can be considered during three stages of development, the construction stage, the operational stage and during decommissioning.

Incorporated Mitigation

Several pollution prevention and drainage management features are inherent within the design of the development; a number of these will provide protection to surrounding water features. These are detailed below. However, the main mitigation feature will be the carrying out of all operations within a building and on hardstanding.

- The floors of the poultry houses will be constructed from reinforced concrete rendering it waterproof and so preventing potential of manure effluent seepage into groundwater.
- During the washing down of the poultry houses all dirty water will be directed to a dirty water tank
- Level indicators in the dirty water tanks will be easily visible from the hardstanding area to quickly identify when the tanks need emptying.
- A diverter valve will be connected to the drainage system for the hardstanding area which will divert the yard water either to the Sustainable Drainage System or to the dirty water holding tanks. During wash down the outfall drain from the hardstanding will be diverted to the dirty water collection tanks.

- All chemical substances and hazardous materials are to be stored in accordance with NRW guidelines.

- All diesel fuel and lubrication oils used during the construction period will be stored in bunded areas; diesel will be contained within double skinned tanks. Bunded areas will have a 110% capacity of the storage tank; and,

- Additionally, the use of SuDS will assist with the attenuation of any polluting surface water runoff.

- Finished Floor Levels (FFLs) are to be at least 0.3m above surrounding ground level reducing risk from flooding.

Construction and Decommissioning Phases

Impacts associated with construction will be similar to those associated with decommissioning and are considered together within this report. Potential impacts are:

- Contamination of groundwater

  Construction at the site will require the use and storage of a wide range of chemicals. The construction will also involve delivery of materials by heavy good vehicles and the use of construction plant on the site. Spillage or uncontrolled disposal of chemicals in any areas of the site could result in contamination of the shallow groundwater beneath the site.

- Pollution of surface water

  As with potential contamination to groundwater, construction will involve the use and storage of chemicals, along with the presence of delivery vehicles and mechanised construction plant. Spillage or uncontrolled disposal of chemicals in any areas of the site could rapidly lead to pollution of surface water runoff from the site from hard-standing surfaces infiltrating into the drainage system.

Table 42 provides a summary of the assessment of potential construction impacts prior to mitigation.

Table 42: Unmitigated Construction and Decommissioning Phase Impacts

Nature of Impact	Pathway	Receptor	Sensitivity of Receptor	Magnitude of Impact	Significance of Impact	Likelihood	Risk
Water Quality	Surface water run-off	River Vrynwy	Medium	Negligible	Low	Low Likelihood	Low risk
	Direct infiltration to ground	Shallow Groundwater	Low	Minor	Minor Low Likelihood	Low Likelihood	Low risk

12.5.3 Operational Phase

This section of the assessment relates to both on-site and off-site impacts to the hydrological environment that could potentially arise from operation of the poultry development.

Potential pollution impacts are:

- Pollution of site runoff by oils and hydrocarbons

  Routine use / presence of lorries and other vehicles across the site and on access routes and associated accidental spills or minor leaks all have the potential to contaminate runoff in the

locality with hydrocarbons or other chemicals. This could then be flushed through the system during heavy rainfall or flooding events which could then lead to contamination of receptors downstream of the site.

If such contamination occurred, it could lead to degradation of water quality in the downstream receptors and associated ecological damage.

- Contamination of groundwater

The operational phase will involve the wash down of the hard standing area to the front of the buildings and the buildings themselves. Leakage of dirty water could occur if operational practices are not developed and managed efficiently.

Routine use of heavy goods vehicles, cars and other vehicles across the site and chemicals stored and utilised on site, all have the potential to create contamination which could then infiltrate into the shallow groundwater either through cracks in hardstanding, or through runoff onto non-developed or designed infiltration areas.

Given the permeability of the shallow geology it is likely that there could be some migration of any released contamination, particularly with regards to shallow groundwater.

Table 43 provides a summary of the potential operational phase pollution related impacts prior to mitigation.

Table 43: Unmitigated Operational Phase Impacts

Source	Nature of Impact	Pathway	Receptor	Sensitivity of Receptor	Magnitude of Impact	Significance of Impact	Likelihood	Risk
Site (operation and storage)	Pollution by oils and hydrocarbon	Surface water run off	Drainage network	Low	Minor	Minor	Unlikely	Very low risk
		Surface water run off	River Vrynwy	Medium	Minor	Minor	Unlikely	Very Low Risk
		Direct infiltration to Ground	Shallow Groundwater	Low	Minor	Minor	Unlikely	Very Low Risk
	Pollution by dirty water	Surface water run off	Drainage network	Low	Negligible	Insignificant	Unlikely	Very Low Risk
			River Vrynwy	Medium	Negligible	Insignificant	Unlikely	Very Low Risk
			Shallow Groundwater	Low	Negligible	Insignificant	Unlikely	Very Low Risk

12.5.4 Impact Assessment

Whilst some potential impact significances are as high as moderate all risks from the operation of the site are classed as low risk or lower.

12.5.5 Mitigation (Contamination and General Risks)

Construction and Decommissioning Phase

Mitigation measures during the construction/ decommissioning phase will help to manage any identified negative impacts deemed to be significant. If possible, works should be avoided, or sensibly managed, in accordance with adverse ground and/or weather conditions occurring such as heavy rainfall or waterlogged soils.

It should also be noted that a minimum 5m wide buffer zone should be left between any works associated with the construction of the proposed development, or the plant itself and any watercourses. Should any of the works during construction be likely to affect a local watercourse (e.g. diversions - whether temporary or permanent), permission will need to be sought from NRW under the Land Drainage Act of 1991 well in advance of construction commencing. At this stage it is not thought that this will be necessary.

Contamination of Groundwater and Surface Water

The storage of polluting materials will be kept to a minimum where practicable, and where less hazardous or inert materials are available these should be specified. For example, construction materials containing sulphides or cement which could potentially alter the pH of runoff will be avoided and the use of biodegradable hydraulic oils could be considered for construction plant. In addition, absorbent mats/pads, absorbent granules and sand will be made available, and site operatives trained in their use, to deal with any spillages.

Further measures to be adopted include locating mobile plant, batching plant, materials storage, topsoil storage, and waste disposal facilities at least 20m from water features. Further, the positioning of fuel storage tanks and other potentially polluting materials and maintenance facilities will be on bunded areas of hard standing with dedicated drainage systems. The bunded areas will be protected from direct rainfall by organic mulch or a temporary sward, and stored materials on site will be checked regularly for containment integrity (both primary and secondary), quantity stored and security of storage.

Construction of concrete structures during the construction phase would be monitored to prevent cementitious material entering any watercourses. Pre-cast work or permanent formwork will reduce the amount of in-situ concreting required adjacent and above the watercourses. Ready mix suppliers will be used in preference to on-site batching. Washing out of concrete wagons or other equipment used in concreting operations will be undertaken in designated contained washout areas. These should be located away from all watercourses, drains and groundwater protection zones, and should be impermeable.

Summary

Given appropriate mitigation as detailed above, the residual potential for impacts on both groundwater and surface water contamination occurring during the construction phase and the significance of any contamination will be minimised.

Table 44 provides a summary of mitigated construction phase impacts to the water environment.

Operation

Pollution from Process Wastes

Management of manure removal will be undertaken with due caution to prevent pollution release. The SuDS system described below (re: Flood Risk) will also provide some level of protection from waste entering the water environment.

Pollution of Site Runoff and Groundwater by Oils and Hydrocarbons

Any operational activities that carry significant risk of oils/hydrocarbon spillage must comply with TAN15. Any operational activities that carry significant risk of oils/hydrocarbon spillage will be subject to a separate task specific environmental risk assessment under the Environmental Permitting Regulations regime and associated licences from NRW.

Implementation of these mitigation measures will ensure that residual impacts on the identified receptors and their significance are minimised. Table 43 provides a summary of mitigated operational phase impacts to the water environment.

12.5.6 Assessment of Residual Impact Significance

Given the additional mitigation set out above, all significant impacts for the construction/decommissioning and operation of the poultry development will be mitigated to a minor level (or less) for all the identified potential impacts. The risks of impact are also reduced to low risk (or less).

All operations will occur on hardstanding within a building, significant protection from pollution incidents is provided to the underlying principal aquifer and surface waters. The mitigation measures specified will, therefore, minimise any potential impacts. Incorporation of standard best practice during the construction works and during operation will also ensure that no major pollution incidents occur and thus protect the aquifer and surface waters. The resulting post-mitigation impacts are set out below in Table 44 for the risks from the construction/ decommissioning phase and in Table 45 for the operational phase.

Following mitigation, all risks from potential impacts have been reduced to low (or less than) and likelihood is reduced to low likelihood or lower.

Table 44: Mitigated Construction and Decommissioning Phase Impacts

Nature of Impact	Pathway	Receptor	Sensitivity of Receptor	Magnitude of Impact	Significance of Impact	Likelihood	Risk
Water Quality	Surface water run-off	River Vrynwy	Medium	Negligible	Insignificant	Unlikely	Very Low Risk
	Direct infiltration to ground	Shallow Groundwater	Low	Minor	Minor	Unlikely	Very Low Risk

Table 45: Mitigated Operational Phase Impacts

Source	Nature of Impact	Pathway	Receptor	Sensitivity of Receptor	Magnitude of Impact	Significance of Impact	Likelihood	Risk
Site (operation and storage)	Pollution by oils and hydrocarbon	Surface water run off	Drainage network	Low	Minor	Minor	Unlikely	Very low risk
		Surface water run off	River Vrynwy	Medium	Minor	Minor	Unlikely	Very Low Risk
		Direct infiltration to Ground	Shallow Groundwater	Low	Minor	Minor	Unlikely	Very Low Risk
	Pollution by dirty water	Surface water run off	Drainage network	Low	Negligible	Insignificant	Unlikely	Very Low Risk
		Surface water run off	River Vrynwy	Medium	Negligible	Insignificant	Unlikely	Very Low Risk
		Direct Infiltration to Ground	Shallow Groundwater	Low	Minor	Insignificant	Unlikely	Very Low Risk

12.6 Flood Risk

12.6.1 Flood Risk Assessment

The Flood Risk Assessment was carried out in line with TAN15 for the site as the site exceeds 1 ha. For any site larger than one hectare NRW's standing policy, in accordance with TAN15, states that an assessment must be undertaken. In addition to assessing external risk of flooding to the site, an assessment must demonstrate that the development would not exacerbate flooding elsewhere. On Brownfield sites it is also necessary to demonstrate that peak rates of flow would be reduced back towards the levels that would be expected from a Greenfield site.

Flood Risk

The site is not located in flood zone 1 indicating that the risk of flooding from major sources is low. As such the sequential test, used by planning authorities to direct development away from areas of high flood risk, indicates that development of this area is potentially appropriate thus no mitigation or management is required.

12.6.2 External Flood Sources

Within TAN15 it is recommended that a Flood Risk Assessment should consider all possible sources of flooding for a given site. The following sources of flooding are summarised in Table 46;

Table 46: Summary of potential flood source

Flood Type	Source	Potential Pathway
Fluvial	River Vrynwy	Flows in excess of channel capacity
	Ponds and Drains on site	Blockage and exceedance of channel/retention area
	Ponds and drains off site	Blockage and exceedance of channel/retention area
Tidal	None	None
Drainage	Mains Supply	Pipe burst and overland flow
	Surface drains and sewers	Blockage and surcharge followed by overland flow
	Foul sewers	Blockage and surcharge followed by overland flow
Overland flow	None	None
Groundwater	Sandstone	High groundwater levels expressed at surface

12.6.3 Risk Assessment

The risk assessment methodology used is set out in section Table 46 above and is based on guidance provided in TAN15. The guidance recommends that flood risk is assessed through consideration of both the magnitude of potential impacts and the probability of occurrence. The magnitude of impact is dependent on two factors; the sensitivity of potential receptors and the severity of the flooding. There are therefore three criteria on which flood risk is assessed. These are:

- Sensitivity of the receptor
- Severity of the flooding; and
- Probability of occurrence.

12.6.4 Sensitivity of Receptors

The development is a building used for agriculture, thus, under the sequential test defined within TAN15 the development would be classified as a *"less vulnerable development".* Given this sensitivity has been defined as moderate.

Development in general has the potential to impact the flood risk posed to off-site receptors. All off-site development is considered to have a very high sensitivity to any increase in flood risk and, therefore, it is important that any adverse off-site impacts on flood severity or frequency are avoided.

12.6.5 Severity and Probability of Flooding

The severity and probability of flooding are both fully defined above and the classification of these criteria is discussed in the following sections.

Tidal

Not relevant at Domgay Hall given the distance from tidal watercourses.

Drainage and Mains Supply

The drainage and mains supply are a significant distance from the site that in the event of a system collapse the total volume of flood waters is not expected to be large enough to cause a flooding event at the site.

Overland Flow

Domgay Hall is on a very gentle slope with no steep slopes in the vicinity. No potential pathways are therefore identified for flooding from overland flows.

Groundwater

The topsoil across the site is underlain by freely draining glacial drift which has the potential to transmit large volumes of water, however the site is on a very gentle slope to the north and is not at the base of a significant slope. There is therefore a low potential for flooding to occur from groundwater seepage.

12.6.6 Summary of Risks

The probability and severity of each type of flooding has been assessed in line with the methodology and guidance set out above. This is then combined with the assessment of receptor sensitivity to define the level of flood risk on a scale ranging from negligible to high. These are outlined in Table 47.

Typically risks assessed to be low or less are acceptable whereas risks assessed to be moderate or high require additional mitigation or management to enable development to proceed. All the risks to the development are assessed as being either low or very low. Thus, no further mitigation or management is required in respect of flood risk.

Table 47: Flood Risk Summary

Flood Source		Pathway	Receptor	Sensitivity	Magnitude of potential hazard	Probability of Impact	Flood Risk
Fluvial	Ponds and drains	Blockage and exceedance of channel/retention area	Development	Moderate	Negligible	Low	Negligible
Drainage	Mains Water	Pipe burst and overland flow	Development	Moderate	Negligible	Very Low	Negligible
	Surface Water Drains and Sewers	Blockage and surcharge followed by overland flow	Development	Moderate	Negligible	Very Low	Negligible
	Foul Sewers	Blockage and surcharge followed by overland flow	Development	Moderate	Negligible	Very Low	Negligible
Increased impermeable areas	Development	Increased surface water runoff	River Severn Flood Plain	Moderate	Moderate	High	High

12.6.7 Internal Flood Sources

Increases in the area of the site covered by impermeable surfaces will lead to higher peak flows from the site and faster flows off the site. This will then discharge into the local drainage system and could contribute to an increased flood risk from the local watercourses and downstream of the site. Note is made of the vast distance of the River Vrynwy to the site. The sensitivity of the receptor is classed as medium, and a medium magnitude of potential. The resulting impact is moderate. There is high probability of occurrence, with a resulting high risk of flooding of downstream receptors.

Increased surface water runoff from increases in impermeable areas poses a high risk of flooding to downstream receptors and will require mitigation.

12.6.8 Flood Risk Mitigation

Site Drainage Systems

The proposals will result in approximately 80% of the site area being converted to an impermeable surface (hardstanding). This increase in impermeable surface area could have an impact on receptors downstream of the site and mitigation is required.

NRW's policy for site redevelopments is that runoff from a site should not be increased. Drainage systems for the site should be designed based on the 1% annual probability design event. Additionally, potential increases in storm severity associated with climate change need to be considered (20% increase in rainfall depths).

Site drainage should be designed based on sustainable drainage principles as laid out in guidance documents including TAN15. The most preferable option for drainage receptors is infiltration drainage or, where this is not possible, or does not provide sufficient capacity; attenuated discharge to watercourses should be sought. Discharge to sewers should only be considered where the above options are not available.

Site drainage should be designed based on sustainable drainage principles as laid out in guidance documents including TAN15. The most preferable option for drainage receptors is infiltration drainage or, where this is not possible, or does not provide sufficient capacity; attenuated discharge to watercourses should be sought. Discharge to sewers should only be considered where the above options are not available.

Sustainable Drainage System

NRW's standing policy for site redevelopments is that runoff from a site should not be increased and that a decrease of site runoff towards Greenfield levels is desirable. Where possible, this should be done using **S**ustainable **D**rainage **S**ystems (SuDS).

A quantitative assessment of the anticipated increase in run-off has been undertaken by estimating the greenfield peak run-off rates and peak run-off rates expected upon completion of the development. The volumes of storage required to limit predicted runoff rates to original greenfield rates have been calculated.

The SPRHOST (standard percentage run-off) value of 15.1%, is indicated for the catchment in the Flood Estimation Handbook (Centre for Ecology & Hydrology, 1999), which is indicative of a sandy soil type. However, the client reports that soils at the site are a medium/heavy loam and the British Geological Survey map sheet 137 shows that the site is located on boulder clay over sandstone. For the purpose of the calculations, the soil type is therefore assumed to be 'loam/intermediate soils'.

12.6.9 Assessment of Residual Impact Significance

Although no significant flood risks have been identified appropriate SuDS will be deployed to ensure the development does not contribute to flooding of downstream receptors. With regards to flood risk,

the application of SuDS will ensure runoff from the site will remain at Greenfield levels, resulting in no impact on flood risk.

12.7 Surface water / Groundwater Pollution – Application and storage of poultry manure

12.7.1 Introduction

This section of the report deals with the issues surrounding the impact of the development on water resources through generation, storage, transport and application to land of all dirty water, slurry and manure likely to be produced by the birds at the poultry installation.

12.7.2 Legislative Framework

Broiler manure is one of the most concentrated sources of nitrogen available from farm livestock – 8 tonnes of broiler manure supplies the same amount of nitrogen as 42 tonnes of cattle farmyard manure. The leaching of nitrogen from fields to watercourses has severe implications upon water quality. Consequently the nitrate pollution prevention regulations 2015 have been introduced to implement the European Community's Nitrates Directive, to reduce nitrogen losses from agriculture to water. They designate areas where nitrate pollution is a problem, known as Nitrate Vulnerable Zones (NVZs). The applicant's farm has been designated as not being in an NVZ area.

12.7.3 Methodology

The application of animal manure, slurry and dirty water to land is planned using the principles laid out in the Defra Guidance notes for Farmers within Nitrate Vulnerable Zones derived from the Nitrate Vulnerable Zones Regulations 2015 which lays down quantitative limits for the application of nitrogen to land.

First, a water features survey has been carried out to identify land where material should not be spread at any time. A ten-metre strip adjacent to all watercourses should be left untreated to avoid direct pollution of surface waters. Risk of pollution of vulnerable groundwater sources such as wells, springs and boreholes is reduced by designating a 50 metre radius non-spreading zone around such sources, variable according to the local geology and topography. Additional areas upon which materials should not be spread include very steep slopes with a risk of run-off all-the-year-round, areas such as SSSIs that are subject to management agreements.

The next stage is to match the quantities of nutrients supplied by the material to the area of land available for application. Current guidance is that there should be sufficient land available so that material can be spread within the requirement so that the total amount of nitrogen in livestock and other organic materials does not exceed a threshold of 170kg/ha/year. This figure includes manure deposited by grazing livestock. Furthermore the amount of available nitrogen in organic material applied to crops should not be more than the crop needs.

The third stage is to assess the risk of pollution that might arise from the application of the material to land, and estimate the number of months that these risks apply. Cropping and soil conditions might also limit land spreading because of the chance of damage. These limitations have been assessed by the production of the Farm Waste Management Plan, the applicant having undertaken a survey of its own landholding in order to assess the risk of spreading material.

Land farmed by the applicant has been divided into three categories according to the criteria laid out in DEFRA guidance leaflet: *Leaflet 8 Guidance for Farmers in Nitrate Vulnerable Zones – Field application of organic manures* and are summarised in Table 48.

Table 48: Classification of Land Spreading

Classification	Restrictions on Application	Location of Area
Non-spreading areas (Red)	At all times of year	Within at least 10 metres of either side of any surface water including ditches, temporary dry ditches and piped ditches.
		Within at least 50 metres of any spring, well, borehole or open reservoir.

Classification	Restrictions on Application	Location of Area
		Very steep slopes where run-off is a high risk throughout the year.
Non-spreading areas (White)	At all times of year	Non-farmed areas – buildings, roads, tracks
		Land use – e.g. woodlands etc
Very High Risk (Orange)	No solid or liquid effluent should be applied during the period of Field Capacity[2]	Fields or part fields next to a watercourse, spring or borehole when the surface is severely compacted[1] or waterlogged.
		Fields or part fields that are likely to flood sometime in most winters.
		Field or part fields next to a watercourse, spring or borehole when the soil is at field capacity (in winter) and there is: ▪ a steep slope ▪ a moderate slope and a slowly permeable soil (i.e. a clay soil or one through which water passes only slowly)
High Risk (Yellow)	No more than 50m³/hectare of liquid effluent should be applied at any one time whilst the fields are at Field Capacity and at least three weeks between applications	Field or part fields next to a watercourse, spring or borehole when the soil is at field capacity (in winter) and there is: ▪ a moderate slope and a well-drained soil ▪ a slight slope and a slowly permeable soil
		All fields or part fields with effective pipe or mole drains that are not already coloured red or orange[3] (see extra limitations below).
		Very shallow soils (less than 30 cm) over gravel or rock, e.g. limestone, chalk, slates and shales.
Low Risk (Green)	Most of the year	Areas with no mole drains or any of the above.

[1] *Severely compacted is when rain stays on the surface after rainfall.*
[2] *Field capacity is when the soil becomes fully wetted and more rain would cause water loss by drainage. This normally happens in autumn and lasts until the spring.*
[3] *Fields or part fields which in the last 12 months have been pipe drained, mole drained or sub-soiled over drains should not be used for spreading.*

12.7.4 Soils and climate of the area

The soils of the areas where manure will be spread are summarised in Table 49 below. The soils are identified on the National Soil Resource Institute website and 1: 250,000 map.

Table 49: Soil types across controlled land

Farm Name	Soil Characteristics	Geology
Domgay Hall	Freely draining floodplain soils	Lowland glacial outwash plain / field

The majority of the land is under-drained and for the purpose of this plan it is assumed that all land is under-drained.

12.7.5 Identification of land available for spreading

The entire landholdings have been assessed for spreading risk according to the recommendations of the Guidance for Farmers in Nitrate Vulnerable Zones. All surface water features have been surveyed and taken into account during the calculation of the land available for spreading.

Part 4 of the Nitrates Pollution Prevention Regulations establishes a limit on the amount of nitrogen (from manufactured nitrogen fertiliser and crop available nitrogen from livestock manures) that can be applied to specified crops. The N max limits for the specified crops allow a range permitted

adjustments to the application limits, however for the purpose of this report, the lowest limit of 170kgN/ha has been used.

12.7.6 Calculation of Manure and Effluent Production

It is proposed to stock the poultry unit with an additional 40,000 birds. The volume of manure generated by these stock numbers is calculated using standard figures published by DEFRA. 1,000 broiler places at an occupancy rate of 85% produce 1.5 tonnes per month. The following table gives a summary of the total volume produced by the site:

Weight manure produced by 1000 broilers per month (tonnes)	Number of birds proposed	Weight of excreta produced per month (tonnes)	Weight of excreta produced per annum (tonnes)
1.5	40,000	60	720

There will be an annual production of 720 tonnes of poultry manure per year.

12.7.7 Dirty Water Production

Wash water from washing down is diluted wash water with a low nitrogen content and therefore can be spread directly on land at all times of the year and does not have to be included within the calculation of nutrient loading for the purpose of field application. Dirty water will be spread directly onto the adjoining land thereby eliminating the need to travel on the local highway.

12.7.8 Manure Storage

Crops will not require applications of poultry manure throughout the year due to growth stages and lack of ability of the crops to utilise the nutrients. Should the manure not be spread directly onto the land as soon as it leaves the poultry development it will be stored in a number of covered areas on the farm. No manure will be stored in in-field heaps.

12.7.9 Calculation of Nutrient Loading

The main limitation on the application of organic manure to land is its total nitrogen content. In order to comply with the regulations manures applied to pasture land should not contain more than a total of 170kg nitrogen per hectare covered. Standard nutrient production figures are published by DEFRA. The total nitrogen produced by 1000 broiler places is 330 kilograms per year.

The following table provides a breakdown of annual nitrogen production of the site:

Total N produced by 1000 broilers (kg/year)	Number of birds proposed	Total N produced by proposed development (kg/year)
330	40,000	13,200
Spreading area at 170 kg total N/ha/annum		77.64

In accordance with the Codes of Good Agricultural and Environmental Conditions and Cross Compliance Regulations, the total manure to be spread on land at Domgay Hall will be 24,355.9kg N (143.27 hectares with 170kg per hectare of total nitrogen). The excess manure will be exported off site to Thornfield 003 Ltd AD plant as per GN021 Section 4 – Contingency for Storing Manure and Slurry. Should the excess manure not be able to be exported to Thornfield 003 Ltd's AD plant, there are a number of covered areas on the farm to allow for storing of the manure. We refer you to the manure management plan submitted as part of the proposed development.

12.7.10 Other Nutrient Leaching

Broiler manure is also a significant source of phosphorous, another essential plant nutrient. However, if applied excessively it will lock up other minerals thereby decreasing crop yields. Excessive

phosphorous application can lead to eutrophication of watercourses, ultimately killing aquatic life. Current soil indices across the farm are significantly below 4.

12.7.11 Environmental Permitting Regulations

In addition to the measures detailed above, it is a requirement under the Environmental Permitting (England and Wales) Regulations 2017 that the site has a Permit to operate. Under the Environmental Permitting regime the emissions of the proposal to groundwater are assessed within the requirements of Best Available Techniques.

12.7.12 Discussion and Conclusions

The main limitation on stocking rates at the poultry unit is the availability of land. In order to maximise the efficiency of the farming operations and reduce the risk of pollution, manure arising from the development will be applied to the land with the recommendation of good agricultural practice on the land within the control of the applicant as appropriate.

Sufficient suitable land is available within the applicant's holding to enable manure to be applied to land in a way that is beneficial to crops and presents a minimal risk of pollution to surface waters in line with the NVZ regulation and the DEFRA Code of Good Agricultural Practice for protecting Water, Soil and Air.

The excess manure will be exported off site to Thornfield 003 Ltd AD plant as per GN021 Section 4 – Contingency for Storing Manure and Slurry (we refer you to the manure management plan submitted as part of the proposed development).

12.7.13 Mitigation against Nutrient Overloading

Regular soil testing is carried out by the applicant across the land farmed by the applicant; nutrient (phosphate and nitrogen) levels of the soils are recorded and programmed into a Global Positioning System attached to machinery used for spreading organic fertiliser (manure) and inorganic fertiliser; the system applies nutrients at the necessary rate according to the soil tests and statutory loading limits.

12.8 Follow Up Actions

Short term surveillance monitoring will be undertaken to ensure that no detrimental impacts occur during site construction, decommissioning and operation. This short surveillance monitoring should include specific water quality monitoring for shallow groundwater and surface water monitoring and assessment of existing EA data regarding the biological health of the River Vrynwy. Such monitoring will be carried out by the site operator in accordance with requirements set by the EA under the Environmental Permitting regime.

12.9 Conclusions

A number of potential impacts on the local hydrology and hydrogeology have been identified as a result of the construction and operation of a Poultry Development at the site.

Potential impacts include the risk of groundwater and surface water contamination from oils and hydrocarbons and dirty water.

Both development and operation of a poultry installation on this site have the potential to negatively impact on the hydrology and hydrogeology of the area through the contamination of surface water and groundwater. Employing appropriate construction techniques (see Pollution Policy Guidance - PPG documents) and good design will ensure that these risks will be successfully mitigated.

The significance of such impacts has been systematically evaluated and mitigation measures for each of the impacts have been identified. Following mitigation, the significance of residual impacts is all reduced to a minor level or below.

CHAPTER 13 – SOILS

13. 13 Soils

This chapter assesses the impact on soils on site and soils to which poultry manure will be applied. No significant impacts upon soils are envisaged.

13.1 13.1 Introduction

13.1.1 Introduction to the Issues

This chapter considers the baseline soil conditions and of the potential impact to soils that may result from the construction, operation and decommissioning of the poultry installation and the spreading of poultry manure on agricultural land.

13.2 Overview of Potential Impacts on Soils

In the absence of mitigation, the potential impacts to soils arising from the poultry installation include, but are not limited to, the following:

- Construction: Compaction of soils, and removal of surplus soil and isolated occurrences of soil contamination;
- Operation – on-site: Contamination of soils from potential spillages and leaks on site including hydrocarbons and liquids originating from the poultry installation; and
- Operation – off-site: Compaction of soils from spreading of manure, contamination from heavy metal inputs
- Decommissioning: Contamination could arise during the decommissioning process from chemicals/materials stored on-site during operation and the exposure of soil as the hard standing is removed.

Impacts on soils may lead to secondary effects on groundwater, surface water and ecological receptors and therefore reference should also be made to Chapters 10 – Ecology, and 12 - Water Resources.

Summary of Potential Impacts

Table 50 provides a summary of the impacts that could potentially occur as a result of the redevelopment of the site as a poultry installation. However, it does not necessarily follow that all these impacts would actuality occur.

Table 50: Potential Impacts Resulting from Development

Key Activities	Specific Element/Activity	Potential Impacts Potential Effect	Potential Receptors Sensitive
Construction	Use of heavy Machinery	Compaction of soil, increased runoff	Soils
Operation	Use of poultry installation	Leaks of potential contaminants. Examples include, but not limited to: manure leachates; dust; process chemicals; oils etc.	Soils
Operation	Application of poultry manure to agricultural land	Compaction of soil, increased run off	Soils
Operation	Application of poultry manure to agricultural land	Heavy metal and Veterinary Medicine input to soils	Soils
Decommissioning	Removal of poultry installation	Leaks of potential contaminants. Examples include, but not limited to: manure leachates; dust; process chemicals; oils etc.	Soil

Key Activities	Specific Element/Activity	Potential Impacts Potential Effect	Potential Receptors	Sensitive
Decommissioning	Removal of hard standing/buildings	Exposure of soils which could lead to leaching of any contaminants and increased sediment load	Primarily soils	

13.3 13.3 Methodology

13.3.1 Methodology and Relevant Guidance/Standards

The assessment of potential impacts on soils arising from the poultry installation has been undertaken by analysing any interactions between the construction, operational and decommissioning processes on soil conditions. This assessment is inevitably linked with the assessment of water resources (Chapter 12) and follows a similar methodology.

The assessment identifies the likely risks of soil contamination during the construction, operational and decommissioning phases of the poultry installation. This involves assessing the significance of any potential effects by determining the sensitivity of the receptor and the magnitude of the potential effect. A qualitative risk assessment has been undertaken to establish the significance of possible effects through consideration of the likelihood of an event and the severity of the hazard to the soil.

13.3.2 Assessment Criteria

The significance of any impacts of the poultry installation on baseline conditions is assessed as part of the impact assessment. The sensitivity of the receptor and the magnitude of any potential impact combine to determine the significance of any impact.

Magnitude, sensitivity and significance criteria were developed for the conditions prevailing at the Domgay Hall site and are detailed below. In this assessment, consideration of likelihood of the effect occurring is also incorporated into a final risk based assessment.

Magnitude

The criteria used to determine the magnitude of a potential impact are defined in Table 51 below. Assessment of magnitude includes consideration of the amount and intensity of impact and the duration of that impact (i.e. whether permanent or temporary).

Table 51: Impact Magnitude Criteria

Magnitude	Definition
Negligible	Unquantifiable or unqualifiable change in soil conditions
Minor	Detectable but minor change to soil conditions. Soil quality standards less than threshold and unlikely to affect most sensitive receptors (e.g. a minor spillage)
Moderate	Detectable change to soil conditions resulting in non-fundamental temporary or permanent consequential changes. Some deterioration in soil quality likely to temporarily affect most sensitive receptors (e.g. a minor spillage).
High	Fundamental change to soil conditions (including deterioration in soil quality) resulting in temporary or permanent consequential changes (e.g. major spillage resulting in dangerous levels of contamination).

Sensitivity

Sensitivity criteria can be based both on the degree of environmental response to any particular impact, as well as the 'value' of the receptor (e.g. greenfield soils with an agricultural land use are more sensitive than brownfield soils present on an industrial/commercial site). The sensitivity criteria developed for this assessment are presented in Table 52.

Table 52: Sensitivity Criteria

Sensitivity	Definition
Negligible	Environment is insensitive to impact, no discernible changes e.g. soils are not in use, the land has an industrial/ commercial land use and/or mainly covered by hard standing.
Low	Environment responds in a minimal way such that only minor changes are detectable e.g. landscaped areas
Medium	Environment clearly responds to effect(s) in quantifiable and/or qualifiable manner e.g. low grade agricultural land, recreational ground.
High	Environment responds to major change(s) e.g. agricultural land use for food production, allotments.

Significance

The combination of magnitude and sensitivity logically combine to provide a matrix categorisation of significance. Significance levels are presented in 53.

Table 53: Significance Matrix

		Sensitivity			
		Negligible	Low	Medium	High
Magnitude	Negligible	Insignificant	Insignificant	Insignificant	Insignificant
	Minor	Insignificant	Minor	Minor	Moderate
	Moderate	Insignificant	Minor	Moderate	High
	High	Insignificant	Moderate	High	Very High

13.3.3 Risk Assessment

Qualitative Risk Assessment Methodology

Risk assessment is the process of collating known information on a hazard or set of hazards in order to estimate actual or potential risks to receptors. The receptors may be human health, agricultural land, a water system, a sensitive local ecosystem or even future construction materials. Receptors can be connected with the hazard under consideration via one or several exposure pathways (e.g. the pathway of direct contact or indirect transport by wind/water etc). Risks are generally managed by isolating or removing the hazard, isolating the receptor, or by intercepting the exposure pathway. Without the three essential components of a source (hazard), pathway and receptor, there can be no risk.

Thus, the mere presence of a hazard at a site does not mean that there will necessarily be attendant risks.

Sources

Potential sources of contamination are identified for the Domgay Hall site and agricultural land on which manure will be spread, based on a review of the proposed uses. Not only the nature but also the likely extent of any contamination is considered, e.g. whether such contamination is likely to be localised or widespread.

Pathways

The mere presence of a contaminant does not infer a risk. The exposure pathway determines the dose delivered to the receptor and the effective dose determines the extent of the adverse effect on the receptor. The pathway which transports the contaminants to the receptor or target generally involves conveyance via soil, water or air or may be direct.

Receptors

The varying effects of a hazard on individual receptors depend largely on the sensitivity of the receptor. Receptors include any people, animal or plant population, or natural or economic resources within the range of the source which are connected to the source by the transport pathway, although in this instance the assessment is concerned primarily with soils.

Exposure Assessment (Likelihood of Occurrence)

By considering the source, pathway and receptor, an assessment is made for each contaminant on a receptor by receptor basis with reference to the significance and degree of the risk. In assessing this information, a measure is made of whether the source contamination can reach a receptor, determining whether it is of a major or minor significance (as set out above).

The assessment of risk presented here has been based upon the procedure outlined in the Department for the Environment Transport and the Regions (DETR) Circular 02/2000. In addition, the DETR (now Defra) with NRW and the Institute of Environment and Health, has published guidance on risk assessment (Guidelines for Environmental Risk Assessment and Management). This guidance states that the designation of risk is based upon a consideration of both:

- The likelihood of an event; (takes into account both the presence of a hazard and receptor and the integrity of the pathway); and
- The severity of the potential significance (takes into account both the potential severity of the hazard and the sensitivity of the receptor).

Table 54 shows how the risk rating is achieved by combining the likelihood of the event and the degree of significance.

Table 54: Risk Assessment Matrix

		Significance			
		High	Moderate	Minor	Insignificant
Probability (likelihood)	High Likelihood	Very high risk	High risk	Moderate risk	Low risk
	Likely	High risk	Moderate risk	Moderate/Low risk	Low risk
	Low Likelihood	Moderate risk	Moderate/low risk	Low risk	Very Low risk
	Unlikely	Moderate/low risk	Low risk	Very low risk	Very Low risk

Under such a classification system the following categorisation of risk has been developed and the terminology adopted as shown in Table 55.

Table 55: Risk Criteria

Term	Description
Very High Risk	There is a high likelihood that severe harm could arise to a designated receptor from an identified hazard at the site without appropriate remedial action.
High Risk	Harm is likely to arise to a designated receptor from an identified hazard at the site without appropriate remedial action.
Moderate Risk	It is possible that, without appropriate remedial action, harm could arise to a designated receptor. It is relatively unlikely that any harm would be high, and if any harm were to occur it is more likely that such harm would be relatively minor.
Low Risk	It is possible that harm could arise to a designated receptor from an identified hazard but it is likely that, at worst, this harm, if realised, would normally be minor.
Very low risk	The presence of an identified hazard does not give rise to the potential to cause significant harm to a designated receptor.

The assessment of likely significant impacts of the poultry installation is initially based on potential impact before mitigation and is addressed in sections to follow. Levels of assessed impact which are moderate or above require mitigation/management to reduce the level of impact to negligible or low levels. Proposed mitigation is discussed in Section 13.7 and the residual effects after mitigation are presented if required following this section.

13.4 The Baseline Environment and Sensitive Receptors

13.4.1 Geology and Soils

The site geology and the geology of soils on which application of manure is proposed is summarised in Table 56.

Table 56: Soil types across controlled land

Farm Name	Soil Characteristics	Geology
Domgay Hall	Freely draining floodplain soils	Lowland glacial outwash plain / field

13.5 Assessment of Impacts and Risk

13.5.1 Basis for Assessment and Incorporated Mitigation Measures

The impact assessment for the poultry installation on soils has been undertaken assuming the following:

- The proposed poultry buildings at Domgay Hall site will produce a maximum of23.8 tonnes of poultry manure per annum
- Chemicals will be stored on the site for cleaning processes;
- Soils will be excavated and re-graded to allow for a basement level;
- The site will be covered with approximately 80% hard standing and 20% landscaped areas.

The impact assessment for the poultry installation on soils also assumes the following incorporated mitigation measures:

- Operation in accordance with Pollution Prevention Guidelines (PPGs) (see Chapter12 – Water Resources) and licensed by Natural Resources Wales under the Environmental Permitting regime;
- All bulk storage tanks will be appropriately bunded and located on areas of hard standing;
- All tanks, bunds, drains and hard standing will be inspected frequently for damage, maintained and remedial works conducted if necessary.

13.5.2 Potential Sources, Pathways, Receptors and Impacts

A variety of sources, pathways and receptors have been identified as outlined below.
These are generally associated with the release of chemicals, fuels and oils and soil compaction.

Sources

- Storage and use of inorganic and organic chemicals during the construction, operation and decommissioning of the poultry installation;
- Use of heavy machinery on site and during application of soil to land (compaction of soils); and
- Heavy metal content of poultry manure, veterinary medicines within poultry manure.

Pathways

- Leaching of inorganic and organic chemicals;
- Building works affecting soil structure; and

- Application of poultry manure to land.

Primary Receptors

- Soils.

Potential Impacts

The principal potential impacts on soil considered in this assessment comprise:

- The contamination of soils by inorganic and organic chemicals during construction, operation or decommissioning phases;
- Contamination of soils through build up of heavy metals; and
- Direct damage to the soils via compaction.

Soil Compaction from Spreading of Manure

The UK poultry flock (including layers and broilers) produces around 4 million tonnes of poultry manure per year (Chambers & Smith, 1998). This contains around 49,000 tonnes of nitrogen following ammonia losses (31,000 t of N) and losses to incineration (20,100 t of N). To comply with the Nitrate Pollution Prevention Regulations 2008, poultry manure applications to agricultural land should supply no more than 170 kg total N/ha per annum (except in some circumstances – for this assessment the lowest possible figure has been used to present a worst case scenario). Poultry manures are therefore spread across around 200,000 hectares of agricultural land. When this is spread in wet soil conditions it can potentially lead to soil compaction (Larsen et al., 1994).

The magnitude of impact without mitigation would be moderate.

Soil Compaction from Construction

The compaction of soils during construction may also increase surface runoff. This risk is assessed in Chapter 12 – Water Resources. Direct damage to the soils on-site via compaction is not considered significant as the site will require significant areas of made up ground. The soils also do not support important habitats and as such the issues of compaction from construction have not been assessed further in this chapter.

The magnitude of impact without mitigation would be moderate.

Heavy Metals

At the field level, zinc inputs from layer manure are higher than those from any other livestock manure, including pigs (Nicholson et al., 2003). Zinc inputs from layer manure to agricultural land in England and Wales amount to 2.7 kg Zn ha^{-1} a^{-1}, while copper inputs amount to 0.4 kg Cu ha^{-1} a^{-1}.

Heavy metal inputs from broiler litter are lower than those from pig and layer manure (Nicholson et al., 2003). Zinc inputs from broiler litter to agricultural land in England and Wales amount to 1.1 kg Zn ha^{-1} a^{-1}, while copper inputs amount to 0.2 kg Cu ha^{-1} a^{-1}.

The magnitude of impact without mitigation would be moderate.

Veterinary Medicines

The only veterinary medicines routinely used in broiler feed are coccidiostats, endogenous oestrogens.

Data available on endogenous oestrogens (Shore *et al.*, 1988) demonstrate that these compounds can be transported from poultry farms, via agricultural run-off to rivers and streams. Oestrogen (as an endocrine disruptor) can affect reproduction in fish species.

Increased concentrations of oestrogen can give rise to male fish gaining female characteristics, which could in turn impact on reproduction - this has been studied in Atlantic salmon and other species.

There is a scarcity of research about the impacts of poultry production on biodiversity.

The magnitude of impact without mitigation would be moderate.

13.6 Assessment of Impact Significance

The significance of potential impacts is assessed from a combination of the sensitivity of the receptor and the magnitude of the impact. This is summarised in Table 57.

The differences between construction, operation and decommissioning are not deemed relevant for this assessment. Differences in construction, operational and decommissioning phases will have an effect on the probability or likelihood of the impact being realised.

Table 57: Assessment of Significant Unmitigated Impacts

Source	Potential Impact	Receptor	Sensitivity of Receptor	Magnitude of Potential Impact	Resulting Significance (if realised)
Storage and use of inorganic and organic chemicals during the construction, operation and decommissioning of the proposed poultry installation;	Contaminate Soils	Soils	Negligible	Moderate	Insignificant
Use of heavy machinery on site and during application of soil to land (compaction of soils); and	Compaction	Soils	Negligible	Moderate	Insignificant
Heavy metal content of poultry manure, veterinary medicines within poultry manure.	Contaminate Soils	Soils	Negligible	Moderate	Insignificant

13.6.1 Unmitigated Risk

The actual likelihood or probability of the above linkages being realised requires assessment so that the level of overall unmitigated risk can be qualified and the likely significant impacts identified. The overall risk assessment matrices are provided in Table 58. These have been developed based on the combination of the significance of the potential impact and the likelihood of that potential impact occurring.

The assessment of overall risk indicates that there is a low likelihood of many of the impacts has resulted in the risks being very low.

Table 58: Risk Assessment Table – unmitigated risks

Source	Potential Impact	Receptor	Resulting Significance (if realised)	Likelihood Construction	Operation	Decommissioning	Risk Construction	Operation	Decommissioning
Storage and use of inorganic and organic chemicals during the construction, operation and decommissioning of the proposed poultry installation;	Contaminate Soils	Soils	Insignificant	Likely	Low	Likely	Low Risk	Very Low Risk	Low Risk
Use of heavy machinery on site and during application of manure to land and construction of development	Compaction	Soils	Insignificant	Likely	Likely	Likely	Low Risk	Low Risk	Low Risk
Heavy metal content of poultry manure, veterinary medicines within poultry manure.	Contaminate Soils	Soils	Insignificant	n/a	Likely	n/a	n/a	Low Risk	n/a

13.7 Mitigation and Management

Mitigation and management of potential risks to the soils underlying Domgay Hall and soils across the land on which manure will be spread are as follows:

- Application of poultry manure will only take place when weather conditions are favourable and soil conditions would support machinery. The applicant employs the use of a penetrometer for assessing the levels of compaction; the information that the penetrometer presents is used to ascertain whether sub-soiling should occur.
- Soils are regularly tested across land on which poultry manure is spread. Heavy metal concentrations would be detected and appropriate remedial action taken.
- Defra project SP0129 (Anon, 2001b) concluded that reducing dietary trace element supplementation would be an effective strategy for protecting soils from long-term heavy metal accumulation. Strategies for reducing heavy metal excretion in broiler litter also include:
    - Lowering levels of supplementation through reducing EC maximum levels of inclusion and safety margins
    - Using feeds with higher bioavailability of Cu and Zn
    - Using chelated metals – if they are shown to have consistently higher bioavailability

13.7.1 Regulatory Guidance and Best Practice

There are a variety of best practices and recognised measures to mitigate the identified potential impacts, providing appropriate provisions are made in the construction planning and methodology (see below). These include management at the construction stage and monitoring.

The NRW's guidance on how to comply with your Environmental Permit is the principal document used for guidance on preventing contamination from construction activities.

The significance of potential mitigated impacts is assessed from a combination of the sensitivity of the receptor and the magnitude of the impact. This is summarised in Table 59.

Table 59: Assessment of Significant mitigated Impacts

Source	Potential Impact	Receptor	Sensitivity of Receptor	Magnitude of Potential Impact	Resulting Significance (if realised)
Storage and use of inorganic and organic chemicals during the construction, operation and decommissioning of the proposed poultry installation;	Contaminate Soils	Soils	Negligible	Negligible	Insignificant
Use of heavy machinery on site and during application of soil to land.	Compaction	Soils	Negligible	Negligible	Insignificant
Heavy metal content of poultry manure, veterinary medicines within poultry manure.	Contaminate Soils	Soils	Negligible	Minor	Insignificant

13.7.2 Overall Risk with mitigation

The actual likelihood or probability of the above linkages being realised requires assessment so that the level of overall risk can be qualified and the likely significant impacts identified. The overall risk assessment matrices are provided in Table 60. These have been developed based on the combination of the significance of the potential impact and the likelihood of that potential impact occurring.

The assessment of overall risk indicates that there is a low likelihood of many of the impacts has resulted in the risks being very low.

Table 6o: Risk Assessment Table – mitigated risks

				Likelihood			Risk		
Source	Potential mpact	Receptor	Resulting Significance (if realised)	Construction	Operation	Decommissioning	Construction	Operation	Decommissioning
Storage and use of inorganic and organic chemicals during the construction, operation and decommissioning of the proposed poultry installation;	Contaminate Soils	Soils	Insignificant	Unlikely	Unlikely	Unlikely	Very Low Risk	Very Low Risk	Very Low Risk
Use of heavy machinery on site and during application of manure to land and construction of development	Compaction	Soils	Insignificant	n/a	Low	n/a	Very Low Risk	Very Low Risk	Very Low Risk
Heavy metal content of poultry manure, veterinary medicines within poultry manure.	Contaminate Soils	Soils	Insignificant	n/a	Low	n/a	n/a	Low Risk	n/a

13.8 Residual Impacts and Conclusions

Following mitigation the overall risks of the poultry installation on soils have been assessed as very low and no further mitigation or management issues need to be addressed. Therefore the development is unlikely to give rise to any significant adverse impacts on the soils of the site. Furthermore the regular application of poultry manure to agricultural land can potentially improve soil quality and fertility (Bhogal et al., 2006; Haynes & Naidu, 1998; Hountin et al., 1997; Persson & Kirchmann, 1994; Van Meirvenne et al., 1996).

CHAPTER 14 – HERITAGE

14. Heritage

14.1 Heritage Legislation

Legislation relating to archaeology and to scheduled ancient monuments is contained in the Ancient Monuments and Archaeological Areas Act 1979.

Legislation regarding building of special architectural or historic interest is contained in the Planning (Listed Buildings and Conservation Areas) Act 1990.

Section 66 of the 1990 Act is of relevance in that it states that special regard must be given by the decision maker in the exercise of planning functions to the desirability of preserving a listed building and its setting. Section 72 of the 1990 Act provides protection for the character and appearance of conservation areas.

14.2 Designated Cultural Heritage Assets

A search of 2km was chosen given the relative modest size and scale of the proposal. At distances greater than 2km, a proposal would appear smaller and less obvious within views and is therefore highly unlikely to significantly affect the significance and setting of historic assets.

There are no known designated cultural heritage assets located within the site application boundary. Therefore, there will be no predicted direct impacts arising from the proposed development on designated cultural heritage receptors.

14.2.1 Scheduled Ancient Monuments

There are no SAMS located within 2km of the application site.

14.2.2 Listed Buildings

There are no listed buildings within 2km of the application site.

The listed buildings within the respective study area are considered below:

Name, Grade	Type, Description of Significance and Contribution of Setting to Significance	Overall Effect
No. 1 Domgay Hall Cottages & outbuildings to rear, Grade II	Late C16. Pair of cottages, formerly timber-framed lobby entry house; extended to west in brick and subdivided in C19.	Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
No. 2 Domgay Hall Cottages & outbuildings to rear, Grade II	Late C16. Pair of cottages, formerly timber-framed lobby entry house; extended to west in brick and subdivided in C19.	Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
Rhandregynwen Farmhouse, Grade II	Good quality period farmhouse with late vernacular plan.	Intervening vegetation and topography would prevent any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.

C-Plan Group of Farm Ranges to E of Rhandregynwen, Grade II	Good quality period farmhouse with late vernacular plan.	Intervening vegetation and topography would prevent any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
U-Plan outbuilding Ranges to N & E of Calcott Hall, Grade II	An unusually rare example in Montgomeryshire of an early Georgian country house, now in deteriorating condition. Interior not inspected but believed to retain good doorcase detail and a fine contemporary staircase.	Intervening vegetation and topography would prevent any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
Calcott Hall, Grade II	An unusually rare example in Montgomeryshire of an early Georgian country house, now in deteriorating condition. Interior not inspected but believed to retain good doorcase detail and a fine contemporary staircase.	Intervening vegetation and topography would prevent any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
Gwern-Owddy, Grade II	Good example of a regional vernacular farmhouse.	Due to distance, intervening vegetation and topography, there would not be any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
Milemarker at roadside about 200m NW of Llandrinio Hall, Grade II	A mile marker erected after the second Montgomeryshire Turnpike Act (1803) and one of the very few markers to survive on this road.	Due to distance, intervening vegetation and topography, there would not be any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
House attached to Post Office, including forecourt walls & railings, Grade II	This well-preserved general stores and attached house, opened at the relatively early date of 1868, is a fine example of rural Victorian enterprise. It must have required considerable investment as	Due to distance, intervening vegetation and topography, there would not be any over dominate views of the proposed development.

	well as greatly improving the range of services for this community. Together with the coming of the railway and the Milk Factory, this is a key part of the Victorian development of Four Crosses.	Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
The Post Office, Grade II	This well-preserved general stores and attached house, opened at the relatively early date of 1868, is a fine example of rural Victorian enterprise. It must have required considerable investment as well as greatly improving the range of services for this community. Together with the coming of the railway and the Milk Factory, this is a key part of the Victorian development of Four Crosses.	Due to distance, intervening vegetation and topography, there would not be any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
Greenfield House, Grade II	Greenfield House and the old Milk Factory form a group.	Due to distance, intervening vegetation and topography, there would not be any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
Old Milk Factory(Ice Cremery) adjacent to Greenfield House, Grade II	Greenfield House and the old Milk Factory form a group.	Due to distance, intervening vegetation and topography, there would not be any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
War Memorial, Grade II	Simple granite Celtic-style cross on tapered plinth and squared base. Dressed face to plinth with commemoration of Great War."1914-1919 Live thou for Britain. We for Britain died", and the names of eleven soldiers.	Due to distance, intervening vegetation and topography, there would not be any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
Rhysnant Fach, Grade II	One of the oldest surviving dwellings in the community, with many of its internal features intact. With its outbuildings it forms an attractive grouping clearly visible from the main road and the canal.	Due to distance, intervening vegetation and topography, there would not be any over dominate views of the proposed development. Through the landscaping proposals, it is considered that

		the development would not result in any significant harm to the setting of the building or its cultural heritage.
Outbuilding Range to W of Rhysnant Fach, Grade II	One of the oldest surviving dwellings in the community, with many of its internal features intact. With its outbuildings it forms an attractive grouping clearly visible from the main road and the canal.	Due to distance, intervening vegetation and topography, there would not be any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
Bridge (No. 101) over Montgomeryshire Canal, Grade II	Good, well-preserved example of typical late C18 canal bridge.	Due to distance, intervening vegetation and topography, there would not be any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
Nos. 1-12 (consec) Canal Cottages, Grade II	Group value with Clafton Bridge and Goolden's warehouse and of historic importance as the best group of warehouses along the Montgomeryshire Canal. Although altered, the row still retains much of the character and features from its commercial origins and it presents a striking group on the approaches to Clafton Bridge both from the ramped by-road and from the canal towpath.	Due to distance, intervening vegetation and topography, there would not be any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
Goolden's Warehouse at Clafton Bridge, Grade II	Included for group value with other listed items at Clafton Bridge.	Due to distance, intervening vegetation and topography, there would not be any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
Clafton Bridge (No. 100) & attached Parapets Flanking Road Approaches, Grade II	Group value with the other listed items at Clafton Bridge.	Due to distance, intervening vegetation and topography, there would not be any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to

		the setting of the building or its cultural heritage.
Parson's Bridge (No. 99) over Montgomeryshire Canal, Grade II	Before 1833, probably dating from George Buck's period as engineer for the Montgomeryshire Canal.	Due to distance, intervening vegetation and topography, there would not be any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
The Old School adjoining Llandysilio Churchyard, Grade II	Group value with Llandysilio Church.	Due to distance, intervening vegetation and topography, there would not be any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
Circular Churchyard & Pillar Sundial at Church of St. Tysilio, Grade II		Due to distance, intervening vegetation and topography, there would not be any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
Church of St. Tysilio, Grade II	A finely composed church with an ornate interior and excellent furnishings of the period.	Due to distance, intervening vegetation and topography, there would not be any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
Ty Coch, Grade II	Attractive vernacular farmhouse, one of the few surviving timber-framed buildings in the community. Interior retains many sub-medieval features.	Due to distance, intervening vegetation and topography, there would not be any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.

Cowhouse Range to S. of Rhandregynwen, Grade II	This farm building is a rare survival of a late medieval cruck-framed hall house which, although encased in later walling, has never been radically altered. It has not been subject to any of the normal domestic improvements over the centuries such as ceilings for upper chambers and fireplaces were never inserted, nor has it been plastered or limewashed internally.	Due to distance, intervening vegetation and topography, there would not be any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
Pont Llanymynech (lies partly in Llansdysilio Community area) Grade II*	Completed in 1828. Architect T Penson, the County Surveyor; with advise during the construction from Thomas Telford as problems with the foundations were encountered. Bridge contractor was J Nichol and total cost including approaches was ú14,000.	Due to distance, intervening vegetation and topography, there would not be any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.
Cottage adjacent to the Presbyterian Chapel, Grade II	Interesting survival of unspoilt workers cottage in local vernacular tradition with Gothic Revival influence.	Due to distance, intervening vegetation and topography, there would not be any over dominate views of the proposed development. Through the landscaping proposals, it is considered that the development would not result in any significant harm to the setting of the building or its cultural heritage.

14.3 Conclusion

The proposed development of two poultry units would take place at Domgay Hall.

Due to the distance, intervening vegetation and topography between the proposed development and the listed buildings, it is seen that there will be no impact on the setting or significance of the listed buildings.

The proposed units would be Juniper Green in colour, which would also help soften their appearance in the landscape and reduce their visual impact.

CHAPTER 15 – SUMMARY & CONCLUSIONS

15. Summary and Conclusions

It is clear that, in most cases, even without mitigation, impacts are generally insignificant by reducing stocking density across the site. This has been achieved by appropriate location and design of the poultry installation. Even where significant impacts are identified many are effectively reduced to insignificant by the use of appropriate mitigation. Indeed, in some areas, negative impacts are altered to positive impacts via the application of mitigation and enhancement measures (particularly in relation to traffic and ecology). There are no impacts that remain significantly negative.

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