

# NEW DAIRY UNIT AT SHEEPCOTE FARM, CLIFFORD

## AMMONIA EMISSIONS: IMPACT ASSESSMENT

March 2020

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## CONTENTS

1.0	INTRODUCTION .....	4
1.1	Background.....	4
1.2	Previous Applications / Assessments .....	4
1.3	Approach .....	5
1.4	Scope .....	5
1.5	Experience of the Assessor.....	6
2.0	APPROACH .....	7
2.1	General Approach.....	7
2.1.1	Critical Levels.....	7
2.1.2	Critical Loads .....	7
2.2	Sources and In-Combination Effects .....	8
2.2.1	Shropshire Guidance GN2 .....	8
2.2.2	Natural England.....	9
2.3	Literature Sources .....	9
3.0	SITE SETTING AND OPERATIONS.....	10
3.1	Location.....	10
3.2	Development Description.....	10
3.2.1	Cubicle Building .....	10
3.2.2	Milking Parlour .....	11
3.2.3	Slurry Lagoon.....	11
3.2.4	Silage Bay.....	12
4.0	Dispersion Modelling Inputs .....	13
4.1	Scenarios .....	13
4.1.1	Scenario 1: Historic.....	13
4.1.2	Scenario 2: Existing.....	14
4.1.3	Scenario 3: Proposed.....	15
4.2	Source Parameters .....	16
4.3	Slurry Spreading .....	17
4.4	Buildings .....	18
4.5	Meteorology.....	18
4.6	Topography.....	18
5.0	Ecological Receptors .....	19
5.1.1	Baseline Concentration / Deposition .....	21

5.1.2	Model Input.....	21
6.0	IMPACTS: PROCESS CONTRIBUTION (SCENARIO 1) .....	22
6.1	Results: Critical Levels .....	22
6.2	Results: N Nitrogen Critical Load.....	22
6.3	Results: Acid Critical Load.....	23
7.0	IMPACTS: PROCESS CONTRIBUTION (SCENARIO 2) .....	24
7.1	Results: Critical Levels .....	24
7.2	Results: N Nitrogen Critical Load.....	24
7.3	Results: Acid Critical Load.....	25
8.0	IMPACTS: PROCESS CONTRIBUTION (SCENARIO 3) .....	26
8.1	Results: Critical Levels .....	26
8.2	Results: N Nitrogen Critical Load.....	26
8.3	Results: Acid Critical Load.....	27
9.0	RESULTS: COMPARISON .....	28
9.1	Comparison: Critical Levels .....	28
9.2	Comparison: Critical Loads.....	28
10.0	mitigation .....	29
10.1	Direct Mitigation (Emissions to air).....	29
10.2	Cross Media Considerations.....	29
11.0	CONCLUSIONS .....	30
	APPENDIX A.....	31
	APPENDIX B .....	33
	APPENDIX C .....	35
	APPENDIX D.....	37
	APPENDIX E .....	39

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## 1.0 INTRODUCTION

Isopleth Ltd has been commissioned by Berrys, on behalf of WRL Pugh and Son (also known as M L and C O M Pugh), to carry out a detailed assessment of ammonia impacts associated with a proposed new dairy unit at Sheepcote Farm, Clifford HR3 5HU. The site lies within the administrative area of Herefordshire Council, but is close to the border with Powys, Wales which follows the River Wye approximately 1.5km to the west of the farm.

A drawing showing the site location is included as Appendix A.

### 1.1 Background

The potential ammonia impacts on local ecological sites associated with the development of a new dairy unit at Sheepcote Farm has been assessed. The new dairy unit would consist of a new cattle cubicle building, milking parlour building, feed & milk silos plus retention of a slurry lagoon.

### 1.2 Previous Applications / Assessments

Planning application P190569/F, validated 22nd February 2019 relates to a new dairy facility:

*‘Proposed dairy unit comprising of the erection of a cattle cubicle building, milking parlour building, feed & milk silos, ancillary works plus retention of slurry lagoon.’*

The full details of the proposals are included in the Berrys Design and Access Statement, dated February 2019. In support of the application, Promar International Ltd prepared an ammonia screening assessment.

Herefordshire Council has requested that further (more detailed) assessment is required to quantify ammonia impacts at ecological receptors and this response is included as Appendix B to this report.

Dairy Farms do not currently fall within the Environmental Permitting Regulations (unlike some intensive operations such as pig and poultry). However, in May 2019 the UK government launched a consultation on their Clean Air Strategy. The document proposed measures to help meet agreed air quality targets by reducing emissions from transport, domestic, industry and farming sources. The consultation set out three proposals aimed at reducing ammonia emissions from the farming sector. These included:

- The introduction of nitrogen (or fertiliser) limits;
- The extension of environmental permitting to “large” dairy farms by 2025; and
- Rules on specific emissions-reducing practices.

The proposed facility at Sheepcote Farm does not currently fall under the Environmental Permitting Regulations and it is unlikely that it would be of sufficient size to fall under these Regulations in 2025 should the proposals detailed in the Clean Air Strategy become legislation.



### 1.3 Approach

An assessment of ammonia impacts against critical levels and critical loads (for nutrient nitrogen and acid deposition) has been completed:

- Critical levels are a quantitative estimate of exposure to one or more airborne pollutants in gaseous form, below which significant harmful effects on sensitive elements of the environment do not occur, according to present knowledge.
- Critical loads are a quantitative estimate of exposure to deposition of one or more pollutants, below which significant harmful effects on sensitive elements of the environment do not occur, according to present knowledge.

The type, source and significance of potential impacts have been identified and detailed modelling undertaken in line with guidance issued by the Environment Agency, Natural England and Shropshire Council<sup>1</sup>.

- Environmental Permitting. *Guidance: Air emissions risk assessment for your environmental permit*;
- IAQM: *A guide to the assessment of air quality impacts on designated nature conservation sites*. Version 1.0 June 2019;
- Environment Agency: *Technical guidance on detailed modelling approach for an appropriate assessment for emissions to air* (AQTAG); and
- Shropshire Council Interim Guidance Note GN2 (Version 1, April 2018) *Assessing the impact of ammonia and nitrogen on designated sites and Natural Assets from new and expanding livestock units (LSUs)*.

The assessment has also been prepared to ensure that it meets the requirements of Powys Council and NRW given the proximity of the site to Wales.

Predicted ground level concentrations of ammonia, nutrient nitrogen and acid deposition are compared with relevant air quality standards and guidelines for the protection of sensitive habitats.

### 1.4 Scope

This report is aimed at comparing the predictions of the ammonia modelling with limit values described by Environment Agency, Natural England and Shropshire (and therefore also Herefordshire) Council. This assessment is aimed at meeting the requirements of Natural England and Herefordshire Council.

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<sup>1</sup> Although the development is within Herefordshire Council, they do not have their own guidance relating to ammonia impacts on ecological sites. Herefordshire Council has therefore referenced Shropshire Council guidance.

## 1.5 Experience of the Assessor

According to guidance issued by the Institute of Air Quality Management (IAQM), air quality assessments and surveys must only be completed by a qualified specialist if they are to be considered robust.

The assessment has been completed by Mr Matthew Stoaling of Isopleth Ltd, who is a Fellow of the IAQM. Mr Stoaling has been involved in the field of air quality assessment for over 20 years. During this time he has provided air quality and odour advice and services to a range of industry sectors and clients, including the chemical industry, solid waste, waste water and agriculture. He has also worked on behalf of local authority and government agencies advising on air quality issues, including documents published by the Environment Agency, SNIFFER and the Institute of Air Quality Management.



## 2.0 APPROACH

### 2.1 General Approach

Predicted ground level concentrations of ammonia, nutrient nitrogen and acid deposition are compared with relevant air quality standards and guidelines for the protection of sensitive habitats.

#### 2.1.1 Critical Levels

Critical levels for the protection of vegetation and ecosystems are specified within relevant European air quality directives and corresponding UK air quality regulations. The ammonia critical level is dependent upon the sensitivity of the receiving habitat, in particular whether the site designation confirms that lichens & bryophytes are an important part of the ecosystem's integrity:

**Table 2-1**  
**Ammonia Critical Level**

Concentration ( $\mu\text{g}/\text{m}^3$ )	Habitat and Averaging Period
1	Annual mean. Sensitive lichen communities & bryophytes and ecosystems where lichens & bryophytes are an important part of the ecosystem's integrity
3	For all higher plants (all other ecosystems)

For this reason, the 3  $\mu\text{g}/\text{m}^3$  limit has been used in this assessment except where the site designation confirms that lichens & bryophytes are an important part of the ecosystem's integrity.

#### 2.1.2 Critical Loads

Critical loads are set for the deposition of various substances to sensitive ecosystems.

Predicted contributions to acid deposition and nitrogen deposition have been calculated and compared with the relevant critical load range for the habitat types associated with each designated site as derived from the UK Air Pollution Information System (APIS) website<sup>2</sup>. The contribution to critical loads for Nitrogen deposition are recorded as KgN/ha/yr. Deposition rates are converted to units of acid equivalents ( $k_{\text{eq}}$ /ha/year), which is a measure of how acidifying the chemical species can be, by dividing the dry deposition flux (kg/ha/year) by standard conversion factors.

Deposition rates were calculated using dispersion modelling results processed by following empirical methods recommended by the Environment Agency in AQTAG and summarised below:

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<sup>2</sup> [www.apis.ac.uk](http://www.apis.ac.uk)

Firstly, calculate dry deposition flux using the following equation:

$$\text{Dry deposition flux } (\mu\text{g}/\text{m}^2/\text{s}) = \text{ground level concentration } (\mu\text{g}/\text{m}^3) \times \text{deposition velocity } (\text{m}/\text{s})$$

The applied deposition velocity for ammonia is 0.020 for grassland and 0.030 for woodland. This may be adapted based on the overall concentration of ammonia as a process contribution however this value is appropriate for concentrations below 10  $\mu\text{g}/\text{m}^3$ . An applied deposition velocity for ammonia of 0.005m/s for water bodies has been accepted by consultees such as the Environment Agency for other schemes.

The units are then converted from  $\mu\text{g}/\text{m}^2/\text{s}$  to units of kg/ha/year by multiplying the dry deposition flux by a standard conversion factor for ammonia of 259.7.

For calculation of acidification (Conversion factor to  $k_{\text{eq}}/\text{ha}/\text{year}$ ) the deposition ( $\mu\text{g}/\text{m}^2/\text{s}$ ) must be multiplied by 18.5.

Wet deposition occurs via the incorporation of the pollutant into water droplets which are then removed in rain or snow and is not considered significant over short distances compared with dry deposition and therefore for the purposes of this assessment, wet deposition has not been considered.

## 2.2 Sources and In-Combination Effects

The existing farm is currently a source of ammonia and the proposed farm will also be a source of ammonia.

The Herefordshire Council consultation response is attached as Appendix B to this report. The Natural England consultation response is attached as Appendix C to this report. Both responses refer to the assessment of in-combination effects.

In relation to the assessment of a site where there is an existing source and there is the potential for a reduction in overall impact at a designated site, it is important to note that both the Shropshire Council Guidance GN2 and the most recent Natural England position is that where there is a reduction in impact at receptors, no further assessment of in-combination effects is required.

### 2.2.1 Shropshire Guidance GN2

Shropshire Guidance GN2 (Step 3b: Avoidance of additional PC) requires the assessor to ask the following question:

*'Does modelling of the PC, including BAT (Best Available Techniques) or other avoidance/mitigation measures show either no additional nitrogen Deposition or, a reduction in background nitrogen Deposition?'*

The reason given is that:

*'new sites would have to be N neutral. Extensions to existing sites would need to add no extra N deposition or, ideally, a reduction in the N background level, achieved by use of Best Available Techniques (BAT) or other mitigation measures.'*

If this is the case (i.e. that process contribution impacts are at worst neutral) then the application can be determined providing avoidance and mitigation measures can be conditioned.

This is also consistent with the *Cooperation Mobilisation for the Environment v Verenigin Leefmilieu* (i.e. the Dutch Nitrogen case) which was published on the 7 November 2018 which decided that any new installations causing N deposition to international designated wildlife sites (SACs, SPAs and Ramsars) cannot normally be granted permission unless they are N neutral or preferably provide a betterment, taking mitigation measures into account.

### **2.2.2 Natural England**

The latest Natural England position at the time of writing<sup>3</sup> is that, where assessment predicts that there will be a reduction in ammonia levels when comparing a proposed scheme with an existing scheme, no in-combination impact assessment is required. This is the only logical approach under these circumstances as the overall impact, the Predicted Environmental Concentration, would reduce irrespective of any other sources. This approach is also consistent with the Dutch Nitrogen case noted above.

## **2.3 Literature Sources**

In addition to the general guidance described above, the following sources of guidance and emissions data have been used in the preparation of this assessment:

- Sniffer ER26: SCAIL-Agriculture update. Final Report (March 2014);
- Farming Advice Service (FAS) technical article – Slurry storage requirements. FAS Technical Article January 2013 Final – Issued;
- DEFRA Nitrate Pollution Prevention Regulations 2008. Nitrate Vulnerable Zones (NVZs). NVZ Fact Sheet 1: Slurry and dirty water. Version 2.1, May 2011.
- DEFRA Inventory of Ammonia Emissions from UK Agriculture
- L. Martínez-Suller, G. Provolo, D. Brennan, T. Howlin, O.T. Carton, S.T.J. Lalor and K.G. Richards (2010) A note on the estimation of nutrient value of cattle slurry using easily determined physical and chemical parameters. Irish Journal of Agricultural and Food Research 49: 93–97, 2010

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<sup>3</sup> consultation response from Natural England (December 2019) to Forest of Dean District Council planning application Ref: P1618/19/FUL.

## 3.0 SITE SETTING AND OPERATIONS

WRL Pugh & Son is an existing family farming business who operate in Herefordshire and Powys. They currently operate a dairy unit at Great Quebb Farm, Eardisley but following the recent sale of this farm they wish to relocate the dairy unit to their holding at Sheepcote Farm, Clifford.

### 3.1 Location

Sheepcote Farm is located in West Herefordshire close to the Welsh border, approximately 1 mile north-east of the village of Clifford. The farm is approximately 600m south of the River Wye and is accessed off the B4350 road via a shared drive. The application site is approximately 90m east of the farmhouse and existing farmyard buildings and is currently pasture land.

The site is located at approximate site grid reference OS GR 325855, 246685 as shown in Appendix A.

### 3.2 Development Description

The proposed development is to create a modern dairy unit serving 350 cows. The new buildings will be a cubicle building to house approximately 200 cows over the winter and a milking parlour building, where the cows are milked twice daily. In addition there is a silage (feed) bay and slurry lagoon with capacity to store 4 months' worth of slurry and dirty water.

Existing livestock buildings within the farmyard will also be utilised to house some of the cows over the winter period.

Further details about the proposed dairy unit are provided in the Berrys DAS, the details of which are summarised below. A drawing of the proposed site layout has also been included as Appendix D.

#### 3.2.1 Cubicle Building

The proposed cubicle building houses cows during the winter months so they are protected from the worst weather conditions and also protects the ground/ grass from poaching and over grazing. The buildings have a concrete floor and individual cubicles. Straw bedding is provided and each cubicle has access to a feed trough.

A drainage system will be in place that captures all slurry and wash down water when the floor is cleaned, which is then pumped into the slurry lagoon. This system has a valve to ensure that in a flood event flood waters cannot enter the lagoon. The cows require careful management and high hygiene standards which includes ensuring that any slurry is regularly scrapped into the drainage system.

The cubicle building will be a steel framed building with concrete floor measuring 60m x 23.26m, 4.58m to the eaves and 8.1m to the ridge. It will have open sides, except for feed barriers.

### ***3.2.2 Milking Parlour***

Adjacent to the cubicle building will be the milking parlour. This is where the cows are milked twice per day on a rotating parlour. The building also includes a collecting yard area and individual hospital bays. The concrete floor slopes up to the rotating milking parlour.

The milking parlour will be a steel framed building with concrete floor. The southern and eastern elevations of the building will be open. The northern elevation will be largely enclosed with brick panels and profile metal sheeting above along four bays of the building with the remainder having concrete panels approximately 3m in height with open section above. The western elevation will be enclosed with brickwork at the lower level and profile metal sheeting above.

The building will measure 60m x 29m with eaves heights of 4.74m and 5.96m. The ridge height will be 8.5m.

As with the cubicle building the milking parlour will have a drainage system that captures all slurry and wash down water when the floor is cleaned which is then pumped into the slurry lagoon. This system has a valve to ensure that in a flood event flood waters cannot enter the lagoon.

### ***3.2.3 Slurry Lagoon***

The slurry lagoon has already been constructed and is located on the western side of the site. The lagoon measures 65.5m x 33m with a depth of 4.8m and has been constructed with an earth bund, specialist lining and with safety fencing on top of the bund.

**Figure 3-1**  
**Sheepcote Farm: Slurry Lagoon**





The top of the bund is at a level of 70.90 AOD. The slurry lagoon will store;

- cattle slurry from the cubicle and milking parlour buildings;
- wash down water from the buildings;
- surface water from impermeable concrete yard areas around the buildings;
- rainwater and effluent from the silage bay; and
- rainwater into the slurry lagoon

The slurry lagoon has a cubic metre capacity of 4497m<sup>3</sup> and is capable of storing 4 months' worth of slurry and dirty water from the site. The lagoon will only be fully utilised in the winter months when the dairy cows are overwintering. In other times of the year the lagoons will be primarily holding washwater and surface water (such as rain).

#### ***3.2.4 Silage Bay***

The silage bay was constructed in 2013 and has therefore been in place in excess of 4 years. Silage and feed is stored in the silage bay for use by the cattle and is covered.





## 4.0 DISPERSION MODELLING INPUTS

Detailed dispersion modelling has been completed in line with *Guidance on modelling the concentration and deposition of ammonia emitted from intensive farming. Air Quality Modelling and Assessment Unit v3*. The BREEZE AERMOD model has been used.

### 4.1 Scenarios

The farm is currently used for the housing of upto 280 dairy animals (at any one time) and 170 finisher beef, with the beef animals housed throughout the year on straw bedding. If the scheme is approved, the finisher beef will be removed from Sheepcote Farm thereby removing the associated ammonia emissions from the source inventory and this ammonia assessment (and dispersion modelling) takes this into account through modelling scenarios for the historic, existing and proposed site layouts and operational management:

#### 4.1.1 Scenario 1: Historic

This scenario includes as sources:

- upto 280 dairy animals; and
- 170 finisher beef,

The scenario assumes that the beef animals are housed throughout the year on straw bedding and the dairy animals are only housed for 3 months of the year (winter) also on straw bedding.

**Figure 4-1**  
**Sheepcote Farm: Existing Housing**



The existing breakdown of dairy animals vary over the year with the natural farming cycle and may be described by month as follows:

**Table 4-1**  
**Dairy Animals Housed in Barn**

Month	Age: 0-6 months	Age: 6-24 months	Age: 24 months +
January	0	230	50
February	0	230	50
March	150	0	50
April	150	0	50
May	150	0	50
June	150	0	50
July	0	0	50
August	0	0	50
September	0	0	50
October	0	0	50
November	0	230	50
December	0	230	50

#### 4.1.2 Scenario 2: Existing

This scenario includes as sources:

- upto 280 dairy animals;;
- 170 finisher beef; and
- Lagoon.

As with scenario 1, this scenario assumes that the beef animals are housed throughout the year on straw bedding and the number and duration of dairy animals housed as shown in Table 4-1. The emission factors remain unchanged.

The dispersion model assumes that the lagoon will be used as shown in Table 4-2, below.

**Table 4-2**  
**Lagoon Emissions**

Month	Fill	Specific Emission*	Mass Emission**	comments
January	Slurry	1.40	0.044394	Slurry - lagoon No cover 1.40 kg NH3/m2
February	Slurry	1.40	0.044394	based on 1.2% DM (6.27% for slurry)
March	Dairy Washings	0.27	0.008496	based on 1.2% DM (6.27% for slurry)
April	Dairy Washings	0.27	0.008496	based on 1.2% DM (6.27% for slurry)
May	Dairy Washings	0.27	0.008496	based on 1.2% DM (6.27% for slurry)
June	Dairy Washings	0.27	0.008496	based on 1.2% DM (6.27% for slurry)

Month	Fill	Specific Emission*	Mass Emission**	comments
July	empty	0.00	0.000000	Not used
August	empty	0.00	0.000000	Not used
September	Dairy Washings	0.27	0.008496	based on 1.2% DM (6.27% for slurry)
October	Dairy Washings	0.27	0.008496	based on 1.2% DM (6.27% for slurry)
November	Slurry	1.40	0.044394	Slurry - lagoon No cover 1.40 kg NH <sub>3</sub> /m <sup>2</sup>
December	Slurry	1.40	0.044394	Slurry - lagoon No cover 1.40 kg NH <sub>3</sub> /m <sup>2</sup>

\*kg NH<sub>3</sub>/m<sup>2</sup> per year

\*\*mg NH<sub>3</sub>/m<sup>2</sup> per second

An ammonia emission rate from published library data has therefore been used in this assessment:

- SCAIL emission factor for Slurry - lagoon (No cover) 1.40 kg NH<sub>3</sub>/m<sup>2</sup> per year for the months that the lagoon is used for slurry storage;
- Calculated emission factor for dirty water<sup>4</sup> based on 62.7g/kg (6.27%) dry matter (DM) for slurry and 12g/kg (1.2%) for dirty water. Both values taken from published guidance and literature; and
- No emission for July and August when the lagoon will be empty.

The lagoon has been entered into the model with a surface area of 1800m<sup>2</sup>, following the design of the earth bunded tank. No cover factor has been assumed and based on observations of the slurry lagoon this factor (especially the winter emission rate) is considered to be an overestimate, as can be seen in Figure 3-1 the lagoon contents are very dilute.

#### 4.1.3 Scenario 3: Proposed

This scenario includes as sources:

- 350 full sized dairy animals in the existing housing and new cubicle housing; and
- Lagoon.

As with scenarios 1 and 2, this scenario assumes that the breakdown of dairy animals will vary over the year with the natural farming cycle and may be described by month as shown in Table 4-3.

The emissions from the lagoon are as shown in Table 4-2 as this assumes that there will be a slurry separator and the dry matter proportion will not change. There is likely to be more water in the tank however the surface area would not change (only the depth) when compared with the existing situation.

<sup>4</sup> slurry DM content EF3 = EF2 x ((12.3 x DM) + 50.8)/100

**Table 4-3**  
**Dairy Animals Housed in Barn and Cubicles**

Month	Age: 0-6 months	Age: 6-24 months	Age: 24 months +
January	0	0	350
February	0	0	0
March	0	0	0
April	0	0	0
May	0	0	0
June	0	0	0
July	0	0	0
August	0	0	0
September	0	0	0
October	0	0	0
November	0	0	350
December	0	0	350

## 4.2 Source Parameters

According to the national ammonia inventory<sup>5</sup>, total emission (per animal) is calculated from the initial N input as excretion by livestock and subsequent losses and transformations (between organic and total ammoniacal N, TAN). The emission factor for these animals as used in this assessment has also been derived from the literature detailed in section 2.3. For purposes of calculation, one livestock unit (LU) is equivalent to a single dairy cow or adult male cattle (i.e. steer) and a figure of 0.8 LSU has been applied to the finisher beef at Sheepcote Farm

**Table 4-4**  
**Emissions per Animal**

Month	kg NH <sub>3</sub> /animal place/yr	kg NH <sub>3</sub> /animal place/month
dairy cows on straw	15.70	1.31
calves on straw	1.10	0.09
dairy replacements on straw	6.94	0.58
Beef finisher cattle	12.56	1.05

New low emission housing would be expected to have an emission factor no more than 8.6kg NH<sub>3</sub>/animal place/yr and this value has been applied in this assessment. This is now an upper limit in countries such as the Netherlands, where it was recently reduced from a previous limit of 12.2kg NH<sub>3</sub>/animal place/yr<sup>6</sup>. The SCAIL factor for cows of approximately 25 kg NH<sub>3</sub>/animal

<sup>5</sup> Inventory of Ammonia Emissions from UK Agriculture 2017. DEFRA Contract SCF0107. Inventory Submission Report February 2019 Table 1. Cattle housing EFs (as % of TAN deposited in the house)

<sup>6</sup> Harry Luesink and Rolf Michels (2018) *Economic implications of ammonia regulation in the Netherlands near Natura 2000 areas*.

place/yr is significantly higher than most other published values<sup>7</sup> for modern slatted facilities and is not considered to be representative of current building design and practice although the value for heifers of 13.5 kg NH<sub>3</sub>/animal place/yr is closer to the 2015 Netherlands values. Examples of the designed-in and operational mitigation required to achieve these emission values are provided in Section 9.0 of this report.

### 4.3 Slurry Spreading

Consistent with standard practice on UK farms, Sheepcote Farm utilises slurry spreading for both disposal of slurries and maintenance of soil nutrients. In general terms this remains unchanged across all 3 scenarios, although in practice the farm has adopted more modern methods of slurry spreading in the last 12 months with the purchase of additional machinery to allow trailing shoe application as a change from the historic surface broadcast method. This will reduce the ammonia reduction by 30%-60% in future years when compared with the previous method:

	Surface broadcast	Trailing hose (low emission)	Trailing shoe (low emission)	Shallow injector (low emission)	Deep injector (low emission)
Typical range of dry matter	Up to 12%	Up to 9%	Up to 6%	Up to 6%	Up to 6%
Requires separation or chopping	No	Yes (if over 6% DM)	Yes	Yes	Yes
Relative work rate	→→→→	→→→	→→→	→→	→
Uniformity across spread width	✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Ease of bout matching	✓	✓✓✓	✓✓✓	✓✓✓	✓✓✓
Crop damage	Moderate	Low	Low	Moderate	High
Relative odour	High	Moderate	Low	Low	Very low
Relative ammonia reduction	0%	30-35%	30-60%	70-80%	90%
Capital cost	£	££	£££	£££	££££

- Source: Uk Government. *Code of Good Agricultural Practice (COGAP) for Reducing Ammonia Emissions*. Published 27 July 2018

<sup>7</sup> For example: Deng, Li and Wang *Modeling ammonia emissions from dairy production systems in the United States* Atmospheric Environment Volume 114, August 2015. (Table 3. Comparison of the simulated and measured annual total ammonia (NH<sub>3</sub>) emissions.)

The most important change in relation to slurry spreading as a result of the new farm proposals is the benefit to the environment (particularly to the water environment) that having a slurry lagoon allows:

*‘Having enough storage capacity for your needs means you can just spread slurry and other liquid organic manures onto land when your crops really need it and when weather and soil conditions are right’ – source COGAP 2018*

Where a farm does not have a lagoon, the farm manures must either be applied during the season when crops are unable to take up the nitrogen (i.e. in the winter) or stored in heaps on the farm which will be subject to emission or runoff. As such, although the lagoon will represent a new defined source of ammonia, the emissions to air are unlikely to increase whilst the potential for direct runoff to watercourses will be removed altogether over the winter period when the animals are housed. Nitrogen emissions from both emissions to air and also runoff should be considered in any Habitats Risk Assessment when demonstrating compliance with recent decisions such as the Dutch Nitrogen case (described earlier). The runoff will also contain phosphorous which carries a significant risk for habitats sensitive to eutrophication.

For purposes of this assessment the benefits associated with the improved slurry handling in line with UK Government guidance have not been quantified as it is not possible (in reality) to accurately model these on a dynamic operation such as a farm with a large landholding.

#### **4.4 Buildings**

The movement of air over and around buildings and other structures generates areas of flow re-circulation that can lead to increased ground level concentrations of pollutants close to the source. As the emissions from the site are from open buildings (rather than point sources) the dispersion model takes no account of building downwash effects as there is effectively no defined vertical release.

#### **4.5 Meteorology**

In accordance with current guidance, 5 years of meteorological data has been used (2014 – 2018). The site at Shobdon is the closest representative site with a >90% complete data set.

#### **4.6 Topography**

The presence of elevated terrain can significantly affect ground level concentrations of pollutants emitted from sources in a number of ways. Elevated terrain reduces the distance between the plume centre line and the ground level, thereby increasing ground level concentrations. Elevated terrain can also increase turbulence and, hence, plume mixing with the effect of increasing concentrations near to a source and reducing concentrations further away. The site is located at approximately 68m AOD. Information relating to the topography of the area surrounding the site has been used to assess the impact of terrain features on the dispersion of emissions from the site. Topographical data has been obtained in digital (.ntf) format and incorporated into the assessment.

## 5.0 ECOLOGICAL RECEPTORS

The Natural England consultation response is attached as Appendix C to this report. This letter names the following sites of interest:

- River Wye / Afon Gwy SAC/SSSI;
- Severn Estuary SAC / RAMSAR / SPA / SSSI;
- Bushy Hazels & Cwmma Moors SSSI; and
- Ancient woodland, ancient and veteran trees:
  - Whitney Wood,
  - Kiln Ground Wood,
  - Ton Wood,
  - Great Hill,
  - Castleton Hill Wood,
  - Rabbit Wood,
  - Croft wood; and
  - un-named woodlands

The MAGIC, Shropshire and Powys ecological searches are included within Appendix E. These show the locations of the sites named by Natural England as well as the sites of local ecological interest.

The Ros Goch SSSI is in Wales, however would be relevant if within the relevant ecological screening distance of 5km. As this site is 5.8km from the farm, it is not relevant to this assessment and has not been considered further.

It is important to note that the River Wye SAC has a total area of 2147.64ha, most of which are too remote from the Sheepcote farm site to be of any relevance. For this reason it is important to focus only the descriptions for the SSSI units which make up the SACs when considering the ecology close to the farm, these are:

- River Wye SSSI - Bredwardine Bridge to Whitney Toll (006). Unit Id: 1022170. Unit area (ha): 122.4429; and
- River Wye SSSI - Whitney Toll to Hay (007). Unit Id: 1022171. Unit area (ha): 30.8778

Although the Severn Estuary SAC is mentioned in the Natural England letter, this is nearly 50km from the site and therefore of no relevance in terms of emissions to air.

The limits are based on the Broad habitat and Relevant Nitrogen Critical Load Class:

- River Wye SSSI (006), part of the River Wye SAC: Rivers and Streams;
- River Wye SSSI (007), part of the River Wye SAC: Rivers and Streams;



- Bushy Hazels & Cwmma Moors SSSI - Cwmma Moors (002): Broadleaved, Mixed and Yew Woodland - Lowland
- Ancient Woodlands (various): Broadleaved, mixed and yew woodland (Broadleaved deciduous woodland).

The limits for these Broad habitat and Relevant Nitrogen Critical Load Classes are as shown in Table 5-1, below.

**Table 5-1**  
**Impacts: Limits**

Site	NH <sub>3</sub> µg/m <sup>3</sup>	Lower Critical Load kgN/ha/yr	Upper Critical Load kgN/ha/yr
River Wye SSSI (006)	1 – 3*	None available	None available
River Wye SSSI (007)	1 – 3*	None available	None available
Cwmma Moors SSSI (002)	1	15	20
Ancient Woodland*	1 – 3*	15	20

\*No site specific detail on bryophytes or epiphytes at these sites

\*\*Broadleaved deciduous woodland

Natural Resources Wales has requested that an ammonia critical level of 1µg/m<sup>3</sup> be applied for the River Wye SSSI. The River Wye SSSI is designated as a eutrophic river / stream and therefore does not have any site specific critical load data available. The River Wye SAC is identified as being notable for *Water courses of plain to montane levels with the Ranunculus fluitantis (water-crowfoots) and Callitriche-Batrachion vegetation (H3260) and Transition mires and quaking bogs (H7140)*. There are no Transition mires and quaking bogs (H7140) within the SAC which are in the SSSI units close to the site. Water courses of plain to montane levels with the Ranunculus fluitantis (water-crowfoots) and Callitriche-Batrachion vegetation (H3260) are susceptible to pollution, particularly eutrophication through runoff<sup>8</sup>:

*'Increasing nutrient supply will lead to an overall reduction in the number of species, with a loss of Ranunculus spp. and an increase in pollution-tolerant species such as Potamogeton pectinatus, Myriophyllum spicatum, Sparganium emersum, Schoenoplectus lacustris and filamentous algae. More extreme nutrient increases lead to an overall impoverishment of the plant community, with algae dominating.'*

(Potamogeton pectinatus = pondweed, Myriophyllum spicatum = watermilfoil, Sparganium emersum = bur-reed and Schoenoplectus lacustris = bulrush or clubrush)

The pollution effects are partly a result of increase nitrogen but also phosphorous.

The River Wye is not sensitive to acid deposition. The Acidity critical load functions for the Cwmma Moors SSSI are:

- CLminN 0.142;

<sup>8</sup> English Nature (2003) Ecology of Watercourses Characterised by Ranunculus fluitantis and Callitriche-Batrachion Vegetation. Conserving Natura 2000 Rivers. Ecology Series No. 11.



- CLmaxN 1.79; and
- CLmaxS 1.648.

#### 5.1.1 Baseline Concentration / Deposition

The existing baseline values at each of the designated sites are as follows.

**Table 5-2**  
**Baseline Conditions**

Site	NH <sub>3</sub> concentration	N Deposition (kgN/ha/yr)	N Acid Deposition (kg <sub>eq</sub> /ha/y)	S Acid Deposition (kg <sub>eq</sub> /ha/y)
River Wye SSSI	2.01	10.7	0.8	0.20
Cwmma Moors SSSI (002)	1.68	27.6	2.0	0.40
Ancient Woodland*	1.86	25.6	1.8	0.25

The existing concentration of ammonia at all sites is below the limit of 3 µg/m<sup>3</sup> however above value for epiphytes / bryophytes of 1 µg/m<sup>3</sup>. The existing nitrogen deposition is above the lower and upper N critical load at the Cwmma Moors SSSI and ancient woodland. The existing nitrogen acid deposition is above the CLmaxN at the Cwmma Moors SSSI and ancient woodland.

#### 5.1.2 Model Input

Modelling was carried out with discrete receptors representing the ecological sites of biological interest:

- Rover Wye SAC: 852 receptors; and
- Cwmma Moors SSSI: 3 receptors.

The ancient Woodland sites were entered as discrete receptors:

- Whitney Wood: 325882, 247542;
- Kiln Ground Wood: 326747, 248339;
- Ton Wood: 325111, 245494;
- Castleton Hill Wood (Castleton Covert): 327059, 245960;
- Rabbit Bury Wood: 327691, 245877;
- Grove Wood: 324325, 244936;
- Stocking Covert: 326591, 245888;
- un-named woodland near Green Lane Farm: 326403, 244826;
- un-named woodland near Locksters Pool Farm: 326234, 246268;
- Cwm Thomas Wood: 325725, 248989;
- Cwm yr afr: 324166, 248989.

## 6.0 IMPACTS: PROCESS CONTRIBUTION (SCENARIO 1)

The results of the ammonia modelling for scenario 1 are as follows.

### 6.1 Results: Critical Levels

The maximum dispersion modelling results for each site are shown in the tables below.

**Table 6-1**  
**Results: Critical Levels**

Site	Conc ( $\mu\text{g}/\text{m}^3$ )	Critical Level	% of C.L.
River Wye SSSI	0.419	1.0	41.9%
Cwmma Moors SSSI (002)	0.004	1.0	0.4%
Ancient Woodland*	0.609	1.0	60.9%

Maximum impacts at the River Wye SSSI and the point of highest impact at an ancient woodland site (in this case the un-named woodland near Locksters Pool Farm: 326234, 246268) are predicted to be above 1% of the critical level at the point of greatest impact. The impact at Cwmma Moors SSSI (002) is predicted to be insignificant, either alone or in combination with other schemes.

### 6.2 Results: N Nitrogen Critical Load

The maximum nutrient nitrogen critical load results are shown in table 6-2 below.

**Table 6-2**  
**Results: N Deposition**

Site	kg/ha/yr	Upper C.L.	% of C.L.	Lower C.L.	% of C.L.
River Wye SSSI	0.545	---	---	---	---
Cwmma Moors SSSI (002)	0.033	20	0.2%	15	0.2%
Ancient Woodland*	4.747	20	23.7%	15	31.6%

Maximum nutrient nitrogen impacts at the Cwmma Moors SSSI (002) are below 1% of the N critical load range shown above. The impact is therefore insignificant, either alone or in combination with other schemes. The River Wye SAC / SSSI is not sensitive to N deposition. The maximum impacts at the un-named woodland near Locksters Pool Farm is 31.6% of the lower critical load.

### 6.3 Results: Acid Critical Load

The maximum acid critical load results are shown in table 6-3 below.

**Table 6-3**  
**Results: Acid Deposition**

Site	Conc ( $\mu\text{g}/\text{m}^3$ )	N Acidity ( $\text{kg}_{\text{eq}}/\text{ha}/\text{yr}$ )
River Wye SSSI	0.419	0.039
Cwmma Moors SSSI (002)	0.004	0.002
Ancient Woodland*	0.609	0.338

The increase in acidity when compared with the CLMinN and CLMaxN is shown below. For purposes of interpretation, the APIS descriptions of these two values is as follows:

- CLminN is the deposition independent critical load of acidity solely due to nitrogen removal processes in the soil (nitrogen uptake and immobilisation); and
- CLmaxN is the critical load of acidity assuming only nitrogen contributes to acidification, i.e. when sulphur deposition is zero.

**Table 6-4**  
**Results: Acidity Critical Loads ( $\text{kg}_{\text{eq}}/\text{ha}/\text{yr}$ )**

Site	PC Acidity	CLMinN	%	CLMaxN	%
River Wye SSSI	0.039	---	---	---	---
Cwmma Moors SSSI (002)	0.002	0.142	1.64%	1.790	0.13%
Ancient Woodland*	0.338	0.142	237.9%	1.685	20.05%

The maximum acidification at the Cwmma Moors SSSI (002) is just over 1% of the CLminN but below 0.1% of the CLMaxN. The River Wye SAC / SSSI is not sensitive to N deposition.

The maximum PC impact at an ancient woodland, the un-named woodland near Locksters Pool Farm is 237.9% of the CLminN and 20.05% of the CLMaxN.

## 7.0 IMPACTS: PROCESS CONTRIBUTION (SCENARIO 2)

The results of the ammonia modelling for scenario 2 are as follows.

### 7.1 Results: Critical Levels

The maximum dispersion modelling results for each site are shown in the tables below.

**Table 7-1**  
**Results: Critical Levels**

Site	Conc ( $\mu\text{g}/\text{m}^3$ )	Critical Level	% of C.L.
River Wye SSSI	0.593	1.0	59.3%
Cwmma Moors SSSI (002)	0.005	1.0	0.5%
Ancient Woodland*	0.770	1.0	77.0%

Maximum impacts at the River Wye SSSI and the point of highest impact at an ancient woodland site (in this case the un-named woodland near Locksters Pool Farm: 326234, 246268) are predicted to be above 1% of the critical level at the point of greatest impact. The impact at Cwmma Moors SSSI (002) is predicted to be insignificant, either alone or in combination with other schemes.

### 7.2 Results: N Nitrogen Critical Load

The maximum nutrient nitrogen critical load results are shown in table 7-2 below.

**Table 7-2**  
**Results: N Deposition**

Site	kg/ha/yr	Upper C.L.	% of C.L.	Lower C.L.	% of C.L.
River Wye SSSI	0.771	---	---	---	---
Cwmma Moors SSSI (002)	0.042	20	0.2%	15	0.3%
Ancient Woodland*	6.007	20	30.0%	15	40.0%

Maximum nutrient nitrogen impacts at the Cwmma Moors SSSI (002) are below 1% of the N critical load range shown above. The impact is therefore insignificant, either alone or in combination with other schemes. The River Wye SAC / SSSI is not sensitive to N deposition. The maximum impacts at the un-named woodland near Locksters Pool Farm is 40.0% of the lower critical load.

### 7.3 Results: Acid Critical Load

The maximum acid critical load results are shown in table 7-3 below.

**Table 7-3**  
**Results: Acid Deposition**

Site	Conc ( $\mu\text{g}/\text{m}^3$ )	N Acidity ( $\text{kg}_{\text{eq}}/\text{ha}/\text{yr}$ )
River Wye SSSI	0.593	0.055
Cwmma Moors SSSI (002)	0.005	0.003
Ancient Woodland*	0.770	0.427

The increase in acidity when compared with the CLMinN and CLMaxN is shown below. For purposes of interpretation, the APIS descriptions of these two values is as follows:

- CLminN is the deposition independent critical load of acidity solely due to nitrogen removal processes in the soil (nitrogen uptake and immobilisation); and
- CLmaxN is the critical load of acidity assuming only nitrogen contributes to acidification, i.e. when sulphur deposition is zero.

**Table 7-4**  
**Results: Acidity Critical Loads ( $\text{kg}_{\text{eq}}/\text{ha}/\text{yr}$ )**

Site	PC Acidity	CLMinN	%	CLMaxN	%
River Wye SSSI	0.055	---	---	---	---
Cwmma Moors SSSI (002)	0.003	0.142	2.11%	1.790	0.17%
Ancient Woodland*	0.427	0.142	301.0%	1.685	25.36%

The maximum acidification at the Cwmma Moors SSSI (002) is just over 2.1% of the CLminN but below 0.2% of the CLMaxN. The River Wye SAC / SSSI is not sensitive to N deposition.

The maximum PC impact at an ancient woodland, the un-named woodland near Locksters Pool Farm is 301% of the CLminN and 25.4% of the CLMaxN.

## 8.0 IMPACTS: PROCESS CONTRIBUTION (SCENARIO 3)

The results of the ammonia modelling for scenario 3 (i.e. the proposed scheme) are as follows.

### 8.1 Results: Critical Levels

The maximum dispersion modelling results for each site are shown in the tables below.

**Table 8-1**  
**Results: Critical Levels**

Site	Conc ( $\mu\text{g}/\text{m}^3$ )	Critical Level	% of C.L.
River Wye SSSI	0.394	1.0	39.4%
Cwmma Moors SSSI (002)	0.003	1.0	0.3%
Ancient Woodland*	0.396	1.0	39.6%

Maximum impacts at the River Wye SSSI and the point of highest impact at an ancient woodland site (in this case the un-named woodland near Locksters Pool Farm: 326234, 246268) are predicted to be above 1% of the critical level at the point of greatest impact. The impact at Cwmma Moors SSSI (002) is predicted to be insignificant, either alone or in combination with other schemes.

### 8.2 Results: N Nitrogen Critical Load

The maximum nutrient nitrogen critical load results are shown in table 8-2 below.

**Table 8-2**  
**Results: N Deposition**

Site	kg/ha/yr	Upper C.L.	% of C.L.	Lower C.L.	% of C.L.
River Wye SSSI	0.513	---	---	---	---
Cwmma Moors SSSI (002)	0.022	20	0.1%	15	0.1%
Ancient Woodland*	3.092	20	15.5%	15	20.6%

Maximum nutrient nitrogen impacts at the Cwmma Moors SSSI (002) are below 1% of the N critical load range shown above. The impact is therefore insignificant, either alone or in combination with other schemes. The River Wye SAC / SSSI is not sensitive to N deposition. The maximum impacts at the un-named woodland near Locksters Pool Farm is 20.6% of the lower critical load.

### 8.3 Results: Acid Critical Load

The maximum acid critical load results are shown in table 8-3 below.

**Table 8-3**  
**Results: Acid Deposition**

Site	Conc ( $\mu\text{g}/\text{m}^3$ )	N Acidity ( $\text{kg}_{\text{eq}}/\text{ha}/\text{yr}$ )
River Wye SSSI	0.394	0.036
Cwmma Moors SSSI (002)	0.003	0.002
Ancient Woodland*	0.396	0.220

The increase in acidity when compared with the CLMinN and CLMaxN is shown below. For purposes of interpretation, the APIS descriptions of these two values is as follows:

- CLminN is the deposition independent critical load of acidity solely due to nitrogen removal processes in the soil (nitrogen uptake and immobilisation); and
- CLmaxN is the critical load of acidity assuming only nitrogen contributes to acidification, i.e. when sulphur deposition is zero.

**Table 8-4**  
**Results: Acidity Critical Loads ( $\text{kg}_{\text{eq}}/\text{ha}/\text{yr}$ )**

Site	PC Acidity	CLMinN	%	CLMaxN	%
River Wye SSSI	0.036	---	---	---	---
Cwmma Moors SSSI (002)	0.002	0.142	1.09%	1.790	0.09%
Ancient Woodland*	0.220	0.142	154.9%	1.685	13.06%

The maximum acidification at the Cwmma Moors SSSI (002) is under 1% of the CLminN and the CLMaxN. The River Wye SAC / SSSI is not sensitive to N deposition.

The maximum PC impact at an ancient woodland, the un-named woodland near Locksters Pool Farm is 155% of the CLminN and 13.06% of the CLMaxN.

## 9.0 RESULTS: COMPARISON

The results of the 3 scenarios are provided below:

1. Historic;
2. Existing (with Lagoon);
3. Proposed.

Results are presented for critical levels and N critical loads, with the proposed and historic compared.

### 9.1 Comparison: Critical Levels

The ammonia impacts are presented below.

**Table 9-1**  
**Results: Critical Levels ( $\mu\text{g}/\text{m}^3$ )**

Site	Scenario 1	Scenario 2	Scenario 3	Sc3-Sc1
River Wye SSSI	0.419	0.593	0.394	-0.025
Cwmma Moors SSSI (002)	0.004	0.005	0.003	-0.001
Ancient Woodland*	0.609	0.770	0.396	-0.212

The results show that the impacts associated with the proposed scheme (i.e. Scenario 3) represent a reduction / betterment when compared with Scenario 1 and also Scenario 2. Should the proposals be approved the ammonia impact will therefore be less than 0% at these sites (and therefore also below the threshold of 1%).

### 9.2 Comparison: Critical Loads

The nutrient N impacts are presented below.

**Table 9-2**  
**Results: Critical Loads ( $\text{kg}/\text{ha}/\text{yr}$ )**

Site	Scenario 1	Scenario 2	Scenario 3	Sc3-Sc1
River Wye SSSI	0.545	0.771	0.513	-0.033
Cwmma Moors SSSI (002)	0.033	0.042	0.022	-0.011
Ancient Woodland*	4.747	6.007	3.092	-1.655

The results show that the impacts associated with the proposed scheme (i.e. Scenario 3) represent a reduction / betterment when compared with Scenario 1 and also Scenario 2. Should the proposals be approved the nutrient nitrogen impact will therefore be less than 0% at these sites (and therefore also below the threshold of 1%).



## 10.0 MITIGATION

### 10.1 Direct Mitigation (Emissions to air)

The modelling assumptions rely on the new dairy buildings being of the 'low emission' type, common in new dairy buildings.

Ammonia emissions will be minimised by reducing the exposed surface area of the waste and reducing the movement of air over the waste. The following techniques for reducing ammonia emissions from cattle housing (particularly new buildings) are available and are described in the Code of Good Agricultural Practice (COGAP) for Reducing Ammonia Emissions:

- Regularly wash and scrape floors;
- Design floors to drain effectively so urine and slurry are not allowed to pool;
- Frequently transfer slurry to a suitable store. Ensure grit and sediment are regularly removed from slurry channels and collection systems;
- Grooved floors with perforations can channel urine and improve drainage. Scrapings should occur at least twice daily;
- Reduce the surface area of the slatted area. Maximise the transfer of excreted material to channels, preferably with a 50% covering. Solid floor areas should have provisions such as a slight slope to allow urine to drain to the channels. Channels should be emptied frequently by the use of scrapers (unless designed to drain by gravity), a vacuum system or by flushing with water, untreated liquid manure (under 5% dry matter) or separated slurry;
- Avoid ventilation directly above the surface of the slurry in the channels. Minimise the velocity of the air over the surface of the manure. Where this is unavoidable, the gap between the slats and the manure surface should be sufficiently large to minimise drafts across the surface;
- Reduce the pH of the slurry (acidification); and
- Increase the amount of straw used per animal for bedded systems. Straw can soak up urine and help to keep floors dry, preventing pooling of urine. The appropriate amount of straw depends on the breed, feeding system, housing system and climate conditions.

### 10.2 Cross Media Considerations

The benefits of slurry stores for prevention of eutrophication are well established. The results in this air quality report must be considered alongside the reduction in surface runoff directly to the River Wye attributable to the removal of solid manure piles from the site and spreading during the periods of the year when the plants are able to use the N and P in the spread manures.

## 11.0 CONCLUSIONS

Isopleth Ltd has been commissioned by Berrys, on behalf of WRL Pugh and Son, to carry out a detailed assessment of ammonia impacts associated with a proposed new dairy unit at Sheepcote Farm, Clifford HR3 5HU. The site lies within the administrative area of Herefordshire Council, but is close to the border with Powys, Wales which follows the River Wye approximately 1.5km to the west of the farm.

The type, source and significance of potential impacts have been identified and detailed modelling undertaken in line with EA, Natural England and Shropshire (and therefore Herefordshire) Guidance. The assessment has also been prepared to ensure that it meets the requirements of Powys Council and NRW given the proximity of the site to Wales.

Predicted ground level concentrations of ammonia, nutrient nitrogen and acid deposition are compared with relevant air quality standards and guidelines for the protection of sensitive habitats.

The assessment shows that the proposed scheme will result in lower impacts at ecological sites than the historic or existing scenarios as a result of:

- Use of state-of-the-art buildings;
- Replacement of beef cattle (housed all year) with additional dairy animals (housed in the winter only).

The proposals therefore represent a reduction / betterment when compared with Scenario 1 and also Scenario 2. Should the proposals be approved the ammonia and nutrient nitrogen impact will therefore be less than 0% at these sites (and therefore also below the threshold of 1%).

As the impacts associated with the farm are lower than the existing situation, there is no requirement to consider in-combination impacts / effects. The new Sheepcote Farm site is compliant with the latest Government Guidance which promotes an overall reduction of ammonia to sites of ecological interest and this position has been accepted by organisations such as NRW in relation to other schemes relating to agriculture.

The air quality report must be considered alongside the reduction in surface runoff directly to the River Wye attributable to the removal of the need for solid manure piles at the site and the promotion of spreading during the periods of the year when the plants are able to use the N and P in the spread manures as a result of the lagoon storage.





## APPENDIX B



**From:**  
**To:**  
**Cc:**  
**Subject:** W: Sheepcote  
**Date:** 24 October 2019 13:10:07  
**Attachments:** [image006.png](#)  
[190569 Sheepcote Farm Clifford Land Drainage 31.7.19\\_jm edits.pdf](#)

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Good morning

Following our meeting yesterday (23.10.2019) I hope we all agree from a constructive discussion point that the constraints we are all working with are complex , largely since a number of changes have occurred through recent case law which Juliet has identified below:

- ***Recent Ruling made by the Court of Justice of the European Union (the CJEU) on the interpretation of the Habitats Directive in the case of Coöperatie Mobilisation (AKA the Dutch Case) (Joined Cases C-293/17 and C-294/17).***
- Legislation and Policy - different screening thresholds, guidance from NE/NRW/EA/ NPPF, Gov 25yr Environ Plan. Sensitive receptors, background levels of ammonia; and, in combination effects.
- The **River Wye SAC** is at risk of exceeding its Conservation Objectives for phosphate downstream of the proposal site between a short 2 km stretch of river from the two sewage treatment works (STW) in Hereford (Rotherwas and Eign) to the confluence with the River Lugg SSSI.
- From the information on APIS, NE note that the **Bushy Hazels & Cwmma Moors SSSI** is currently significantly exceeding nitrogen critical loads and failing acidity critical loads.
- Planning and Environmental Permitting are separate regimes considering differing criteria.

Hopefully we can continue to work collectively to achieve the best approach and statutory consultee can finalise a response.

Juliet has forwarded me the below over view of the information and options to be explored if you wish to proceed with submitting further information to us as LPA and for consultation with NE/NRW/EA prior to HRA submission.

It will be beneficial to get a current response from NE and consultees, in light of the further information you have submitted *Hydro-Logic Services Flood Risk Assessment (Revision July 2019)* and *Assessment of Ammonia emissions on Sheepcote Farm, Addendum report, Promar International (no date, post May 2019)*; and, following our meeting any additional details (which are expanded on below) in regards to the BAT options indicated by Tom ([Promar International]/ In combination data/ and address comments raised by Land drainage (recommended re-consultation with EA), Case officer, Ecology, NRW and NE:

The LPA and NE have raised concerns which require clarification; the applicant will need to demonstrate certainty relating to:

1. Age and a breakdown of animal numbers by herd/type and by type of housing (e.g. the average number of Heifers, calving, calf's; any (Steers/bulls/bullocks) duration on site/variation throughout year/ housing and any other feed or likely husbandry impacts or mitigation to consider);
2. Management, Impacts and implication in regards to change from Beef to Dairy;
3. What will happen to the herd if the site is flooded;
4. If the site is flooded are the feed and milk silos sealed adequately against flooding;

5. How will the applicant ensure that structures, materials and animals are not removed to the river during a flood event;
6. Have alternative sites been considered that are not in the flood plain;
7. Proposed BAT Details of the Best Available Techniques and mitigation measures to be implemented and which of these have been included in the modelling;
8. the surface area in square metres of any slurry storage facility on the site (including lagoons) and the type of cover to be proposed;
9. Biodiversity Net Gain (In addition to any required ecological compensation); as per NPPF Guidance and Core Strategy LD2;
10. **Water Impacts /pollutants/ Flood Risk** Flood Risk and certainty in regards to the further information requested by Drainage, dated 31/7/2019 – I have attached and highlighted points, but also the ecological impacts associated by **pollutants on receptors, sensitive features and qualifying species (terrestrial and aquatic)**;

11. **Air Pollution NH<sub>3</sub> and other pollutants on receptors, sensitive features and qualifying species (terrestrial and aquatic)**

The ammonia emissions model should be provided to confirm that the correct details have been inputted inclusive of **in combination (screening Zones for NE & NWS** (different)).

Other sources (other pcs) that could potentially act **in combination must be identified such as:**

- Applications for planning or permitting that are submitted but not yet determined;
- Developments that have planning permission and/or permits but are not yet (fully) operating;
- Developments that started operating after the most recent update of background levels.

A summary table should be provided by the applicant detailing:

The sensitive receptors potentially affected. The ammonia critical level and nitrogen critical load for each sensitive receptor and background levels for the locality

1. Does the process contribution (pc) + sum of other pcs add up to over 1% of the Critical level or critical load of the sensitive receptor?

From the information on APIS, NE note one of the sensitive receptors is exceeding current level. The critical level / load and control measures will have to be considered to reduce the emissions.

***"Bushy Hazels & Cwmma Moors SSSI is currently significantly exceeding nitrogen critical loads and failing acidity critical loads. We would advise the LPA to consider the cumulative impacts of this new proposal, especially given that the site is already in exceedance. There are a number of ancient woodlands within 2km of the proposal site including Whitney Wood, Kiln Ground Wood, Ton Wood, Great Hill, Castleton Hill Wood, Kiln Ground Wood, Rabbit Wood, Croft wood and un-named woodlands.***

*Consider any impacts in line with paragraph 175 of the NPPF. Natural England and the Forestry Commission have produced standing advice"*

Question to assess during the modelling and data presentation – taken from Shropshire Council Interim Guidance Note, April 2018 and in context I have attached below the flow diagram:

2. *Does the PC plus Sum of PCs remain >1% following detailed modelling? A detailed model will be required to complete the assessment from this point forward and must follow the agreed EA AQMAU 2010 v3 guidance*
3. *Does modelling of the PC, including BAT (Best Available Techniques) or other avoidance/mitigation measures show either no additional nitrogen Deposition or, a reduction in background nitrogen Deposition?*
4. *Does the Predicted Environmental concentration, PEC (process contribution (PC) + Sum of other PCs + Background Ammonia concentrations / N deposition) cause an exceedance of the Cle or Clo of the sensitive receptor?*

5. *Are control measures available that can: • reduce the PEC to avoid exceedance of the ammonia critical level or nitrogen critical load or • demonstrate that there will be no adverse effect on the integrity of an international site or • demonstrate there will be no damage to the scientific interest of a national site?*
6. *Are control measures available that can reduce the PEC to avoid exceedance of the ammonia critical level or nitrogen critical load or demonstrate no adverse effects on the sensitive receptors?* (Shropshire Council Interim Guidance Note, April 2018).

#### SUMMARY

- with a view to addressing the Council's concerns, the appellant may wish to present a series of mitigation measures options for the development,
- Alternative solutions which will be less damaging to the integrity of the SAC /SSSIs (Ancient Woodlands, other irreplaceable habitats, and other Natural Assets;
- Alternative Locations;
- Supporting information to demonstrate Imperative reasons of overriding public interest, and;
- the social or economic benefits of the proposal outweigh the harm to the SAC /SSSIs (Ancient Woodlands, other irreplaceable habitats, and other Natural Assets).

Although there is uncertainty as to whether the development with BAT and mitigation would be likely to have no significant adverse effect on the integrity and conservation objectives of the SAC/SSSIs.

- Should the applicant wish to discuss the further information required and scope for mitigation with NE, NE provide advice through our Discretionary Advice Service. Also they may wish to contact directly with NRW to ensure cross border compliance.

Representations made by Natural England, the Environment Agency and NRW must be taken into account before determining the application.

Furthermore determination of the development will be undertaken in the context of the appropriate legislation (for example Habitats Regulations, CROW Act, Environment Act, Town and Country Planning Act 1990 and the Town and Country Planning (Development Management Procedure) (England) Order 2015. Planning policy in the Core strategy and the National Planning Policy Framework will also be applied.

In addition Environment Agency permitting and other Agricultural Compliance will be required, notwithstanding any amendment in compliance criteria following EA consultation on farm regulation/permitting; or which may arise through case studies, Habitats Regulation Assessment NE/NRW Guidance.



## APPENDIX C



Date: 17 May 2019  
Our ref: 280459  
Your ref: 190569



Rebecca Jenman  
Planning  
Herefordshire Council  
Plough Lane  
Hereford  
HR4 0LE

Customer Services  
Hornbeam House  
Crewe Business Park  
Electra Way  
Crewe  
Cheshire  
CW1 6GJ

T 0300 060 3900

## BY EMAIL ONLY

Dear Rebecca

**Planning consultation:** Proposed dairy unit comprising of the erection of a cattle cubicle building, milking parlour building, feed & milk silos, ancillary works plus retention of slurry lagoon.

**Location:** Sheepcote Farm, Clifford, Hereford, Herefordshire HR3 5HU

Thank you for your re-consultation on the above dated and received by Natural England on 18 April 2019

Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

### SUMMARY OF NATURAL ENGLAND'S ADVICE

#### FURTHER INFORMATION REQUIRED TO DETERMINE IMPACTS ON DESIGNATED SITES

As submitted, the application could have potential significant effects on the River Wye Special Area of Conservation (SAC)/Site of Special Scientific Interest (SSSI), Severn Estuary SAC/SPA/RAMSAR/SSSI and Bushy Hazels & Cwmma Moors SSSI. Natural England requires further information in order to determine the significance of these impacts and the scope for mitigation.

The following information is required:

- Habitats Regulation Assessment
- Further details on measures to prevent impacts during flooding.
- Clarification and further information on air quality.

Without this information, Natural England may need to object to the proposal.

Please re-consult Natural England once this information has been obtained.

Natural England's further advice on designated sites/landscapes and advice on other issues is set out below.

#### Recent Caselaw

Notwithstanding the above, your authority should be aware of a recent Ruling made by the Court of Justice of the European Union (the CJEU) on the interpretation of the Habitats Directive in the case of Coöperatie Mobilisatie (AKA the Dutch Case) ([Joined Cases C-293/17 and C-294/17](#)).

The Coöperatie Mobilisation case relates to strategic approaches to dealing with nitrogen. It considers the approach to take when new plans/projects may adversely affect the ecological situation where a European site is already in 'unfavourable' conservation status, and it considers the acceptability of mitigating measures whose benefits are not certain at the time of that assessment.

Competent authorities undertaking HRA should be mindful of this case and should seek their own legal advice on the implications of these recent ruling for their decisions.

## **River Wye Special Area of Conservation (SAC) /SSSI- Objection- further information required.**

The River Wye is a large river and is one of the longest near natural rivers in England and Wales with a geologically mixed catchment, including shales and sandstones. The River Wye and several of its tributaries represent a large, linear ecosystem which acts as an important wildlife corridor, essential mitigation route and a key breeding area for many nationally and internationally important species. The Wye is of special interest for its associated plant and animal communities.

The River Wye [SAC/ SSSI](#) currently suffers from the effects of point source and diffuse water pollution (which includes, but is not limited to waste water from mains /non mains sewage, surface water run-off, road run-off, agricultural run-off and run-off from the urban environment), non-native invasive species, siltation and modifications to the river channel.

The River Wye SAC is at risk of exceeding its [Conservation Objectives](#) for phosphate downstream of the proposal site between a short 2 km stretch of river from the two sewage treatment works (STW) in Hereford (Rotherwas and Eign) to the confluence with the River Lugg SSSI.

The proposal site is within 25m of a water course that is a tributary of the River Wye, within 700m of the River Wye and is within and surrounded by the flood plain of the river (flood zone 3). Dairy farming is a phosphate intensive operation and we have concerns about the potential impacts of this proposal on the River Wye SAC/SSSI.

## **Additional Information required**

### **HRA**

- A Habitats Regulations Assessment considering impacts alone and in combination should be undertaken by the Competent Authority (i.e. the Local Planning Authority).

### **Flood Plain**

The proposal site is within the flood plain and we note that the Design and Access Statement acknowledges that the proposed buildings are floodable. We require the following information/clarification:

- Details of the specialist drainage system that will capture the slurry and wash down water.
- We note that it is stated that the specialist drainage system will have a value to ensure in a flood event flood waters cannot enter the lagoon. In the event of a flood we are concerned that the buildings will flood and slurry and the bedding will be washed into the flood waters. What measures are proposed, if any, to prevent slurry, dirty water etc that is not in the slurry lagoon from being washed away in flood water?
- Does the slurry lagoon have sufficient capacity to cope when the site is flooded and there is less available land to spread on? Do the calculations for slurry storage take into account climate change (ie greater rainfall events)?
- Confirmation that the structure of the slurry lagoon is structurally sound enough to cope with the site being flooded and ensure slurry does not pollute the River Wye? Does the slurry lagoon comply with SSAFO standards and has it had EA sign off?
- Details of the slurry/manure management plan.

- If the site is flooded are the feed and milk silos sealed adequately against flooding?
- How will the applicant ensure that structures, materials and animals are not removed to the river during a flood event?
- What will happen to the cows if the site is flooded?
- Have alternative sites been considered that are not in the flood plain?

### **Surface water drainage**

- Further details on surface water drainage and details of how dirty and clean water will be kept separate.

### **Ammonia Emissions**

Having read through the Assessment of ammonia emissions on Sheepcote Farm, we require the following clarification/ further information:

- This report does not include an assessment of the impacts of dairy and slurry together only dairy alone and slurry alone. Information should be provided on the combined dairy and slurry impacts.
- The report is not clear about what part of the SAC will be affected if the mitigation is not applied (page 9), or clear about which environmental receptors (page 11) or receptor edge (page 12) the report is referring to.
- The report looks at two options, slurry based cubicle housing and straw bedded farm. The Design and Access statement states that they are proposing cubicle building houses with straw bedding and slurry to be washed down. The system the Applicant is proposing to use and how it fits into the results provided in the report should be clarified.
- The coordinates used are 350m to the west of the slurry lagoon land proposed cattle buildings, this might have affected the results of the modelling.
- The final input files for the model should be provided to confirm that the correct details have been inputted.

### **Previous use of site**

We note from the Design and Access statement that the Applicant's wish to move their dairy unit from Eardisley to the application site and that the site is currently pasture land. What existing farming is carried out at Sheepcote Farm?

### **River Wye / Afon Gwy SAC/SSSI**

From Hay on Wye to Rhydspence Natural Resources Wales/ Cyfoeth Naturiol Cymru (NRW/CNC) and Natural England are jointly responsible for the River Wye. We would advise consulting with NRW/CNC.

### **Severn Estuary SAC / RAMSAR/ SPA / SSSI**

The Severn Estuary [SAC](#) / RAMSAR/ [SPA](#) / [SSSI](#) is a large estuary and marginal habitat, especially important for breeding and wintering waders and wildfowl. It is also important for its fish community, one of the most diverse in British waters, that includes a number of rare species. The site is shared with Wales.

The Severn Estuary is downstream of the site. The River Wye joins the Severn Estuary is at Chepstow.

### **Additional Information required**

- A Habitats Regulations Assessment considering impacts alone and in combination should be undertaken by the Competent Authority (i.e. the Local Planning Authority).

## Bushy Hazels & Cwmma Moors SSSI

The proposal site is within 5km of [Bushy Hazels & Cwmma Moors SSSI](#). Bushy Hazels and Cwmma Moors are two adjacent blocks of ancient primary woodland occupying a damp site on loamy soils derived from the Old Red Sandstone series. They form part of the national series of woodlands in Britain. They were selected as representing wet mixed deciduous woodland characteristic of this part of the Welsh borders. The woods are calcareous hazel-ash woods *Corylus avellana*-*Fraxinus excelsior* with locally abundant alder *Alnus glutinosa*.

- Please refer to the ammonia emissions section under the River Wye SAC/SSSI section, the further information requested in this section applies equally to this site.
- The report has not considered impacts on the SSSI in the results or conclusions section and is not clear about the potential impacts on the SSSI in the Findings section.
- From the information on [APIS](#), we note that the Bushy Hazels & Cwmma Moors SSSI is currently significantly exceeding nitrogen critical loads and failing acidity critical loads. We would advise the LPA to consider the cumulative impacts of this new proposal, especially given that the site is already in exceedance.

Please note that if your authority is minded to grant planning permission contrary to the advice in this letter, you are required under Section 281 (6) of the Wildlife and Countryside Act 1981 (as amended) to notify Natural England of the permission, the terms on which it is proposed to grant it and how, if at all, your authority has taken account of Natural England's advice. You must also allow a further period of 21 days before the operation can commence.

### Other advice

In addition, Natural England would advise on the following issues.

#### Ancient woodland, ancient and veteran trees

There are a number of ancient woodlands within 2km of the proposal site including Whitney Wood, Kiln Ground Wood, Ton Wood, Great Hill, Castleton Hill Wood, Kiln Ground Wood, Rabbit Wood, Croft wood and un-named woodlands. You should consider any impacts on ancient woodland and ancient and veteran trees in line with paragraph 175 of the NPPF. Natural England maintains the Ancient Woodland [Inventory](#) which can help identify ancient woodland. Natural England and the Forestry Commission have produced [standing advice](#) for planning authorities in relation to ancient woodland and ancient and veteran trees. It should be taken into account by planning authorities when determining relevant planning applications. Natural England will only provide bespoke advice on ancient woodland, ancient and veteran trees where they form part of a SSSI or in exceptional circumstances.

Further general advice on the protected species and other natural environment issues is provided at Annex A.

If you have any queries relating to the advice in this letter please contact me on 0208 026 0995.

Should the applicant wish to discuss the further information required and scope for mitigation with Natural England, we would be happy to provide advice through our [Discretionary Advice Service](#).

Please consult us again once the information requested above, has been provided.

Yours sincerely

*Gillian Driver*

Ms Gillian Driver  
Lead Adviser  
Land use planning – West Midlands Area Team

## Annex A – Additional advice

Natural England offers the following additional advice:

### Soils

Guidance on soil protection is available in the Defra [Construction Code of Practice for the Sustainable Use of Soils on Construction Sites](#).

### Environmental enhancement

Development provides opportunities to secure a net gain for nature and local communities, as outlined in paragraphs 8 and 170 [National Planning Policy Framework \(NPPF\)](#). We advise you to follow the mitigation hierarchy and principles as set out in paragraph 175 of the NPPF and firstly consider what existing environmental features on and around the site can be retained or enhanced or what new features could be incorporated into the development proposal. Where onsite measures are not possible, you may wish to consider off site measures, including sites for biodiversity offsetting. Opportunities for enhancement might include:

- Providing features for pollinators ([Buglife- Farming and insect pollinators](#) and [Helping Pollinators Locally](#)).
- Using native plants in landscaping schemes for better nectar and seed sources for bees and birds.
- Planting trees characteristic to the local area to make a positive contribution to the local landscape.
- Restoring a neglected hedgerow.
- Creating a new pond as an attractive feature on the site.
- Incorporating swift boxes or bat boxes into the design of new buildings.
- Designing lighting to encourage wildlife.
- Adding a green roof to new buildings.

You could also consider how the proposed development can contribute to the wider environment and help implement elements of any Landscape, Green Infrastructure or Biodiversity Strategy in place in your area. For example:

- Links to existing greenspace and/or opportunities to enhance and improve access.
- Identifying opportunities for new greenspace and managing existing (and new) public spaces to be more wildlife friendly (e.g. by sowing wild flower strips)
- Identifying any improvements to the existing public right of way network or using the opportunity of new development to extend the network to create missing links.
- Restoring neglected environmental features (e.g. coppicing a prominent hedge that is in poor condition or clearing away an eyesore).

Measures to reduce agricultural water pollution could be incorporated into the design for example appropriate drainage management, buffer strips, appropriate slurry storage and application, minimising farm traffic to prevent compaction, appropriate land use (planting crops appropriate for location) fencing off waterways.

### Landscape

Paragraph 170 of the National Planning Policy Framework (NPPF) highlights the need to protect and enhance valued landscapes through the planning system. This application may present opportunities to protect and enhance locally valued landscapes, including any local landscape designations. You may want to consider whether any local landscape features or characteristics (such as ponds, woodland or dry stone walls) could be incorporated into the development in order to respect and enhance local landscape character and distinctiveness, in line with any local landscape character assessments. Where the impacts of development are likely to be significant, a Landscape

& Visual Impact Assessment should be provided with the proposal to inform decision making. We refer you to the [Landscape Institute](#) Guidelines for Landscape and Visual Impact Assessment for further guidance.

### **Protected Species**

Natural England has produced [standing advice](#)<sup>1</sup> to help planning authorities understand the impact of particular developments on protected species. We advise you to refer to this advice. Natural England will only provide bespoke advice on protected species where they form part of a SSSI or in exceptional circumstances.

### **Local sites and priority habitats and species**

You should consider the impacts of the proposed development on any local wildlife or geodiversity sites, in line with paragraphs 171 and 174 of the NPPF and any relevant development plan policy. There may also be opportunities to enhance local sites and improve their connectivity. Natural England does not hold locally specific information on local sites and recommends further information is obtained from appropriate bodies such as the local records centre, wildlife trust, geoconservation groups or recording societies.

Priority habitats and Species are of particular importance for nature conservation and included in the England Biodiversity List published under section 41 of the Natural Environment and Rural Communities Act 2006. Most priority habitats will be mapped either as Sites of Special Scientific Interest, on the Magic website or as Local Wildlife Sites. List of priority habitats and species can be found [here](#)<sup>2</sup>. Natural England does not routinely hold species data, such data should be collected when impacts on priority habitats or species are considered likely. Consideration should also be given to the potential environmental value of brownfield sites, often found in urban areas and former industrial land, further information including links to the open mosaic habitats inventory can be found [here](#).

### **Access and Recreation**

Natural England encourages any proposal to incorporate measures to help improve people's access to the natural environment. Measures such as reinstating existing footpaths together with the creation of new footpaths and bridleways should be considered. Links to other green networks and, where appropriate, urban fringe areas should also be explored to help promote the creation of wider green infrastructure. Relevant aspects of local authority green infrastructure strategies should be delivered where appropriate.

### **Rights of Way, Access land, Coastal access and National Trails**

Paragraphs 98 and 170 of the NPPF highlights the important of public rights of way and access. Development should consider potential impacts on access land, common land, rights of way and coastal access routes in the vicinity of the development. Consideration should also be given to the potential impacts on the any nearby National Trails. The National Trails website [www.nationaltrail.co.uk](http://www.nationaltrail.co.uk) provides information including contact details for the National Trail Officer. Appropriate mitigation measures should be incorporated for any adverse impacts.

### **Biodiversity duty**

Your authority has a [duty](#) to have regard to conserving biodiversity as part of your decision making. Conserving biodiversity can also include restoration or enhancement to a population or habitat. Further information is available [here](#).

---

<sup>1</sup> <https://www.gov.uk/protected-species-and-sites-how-to-review-planning-proposals>

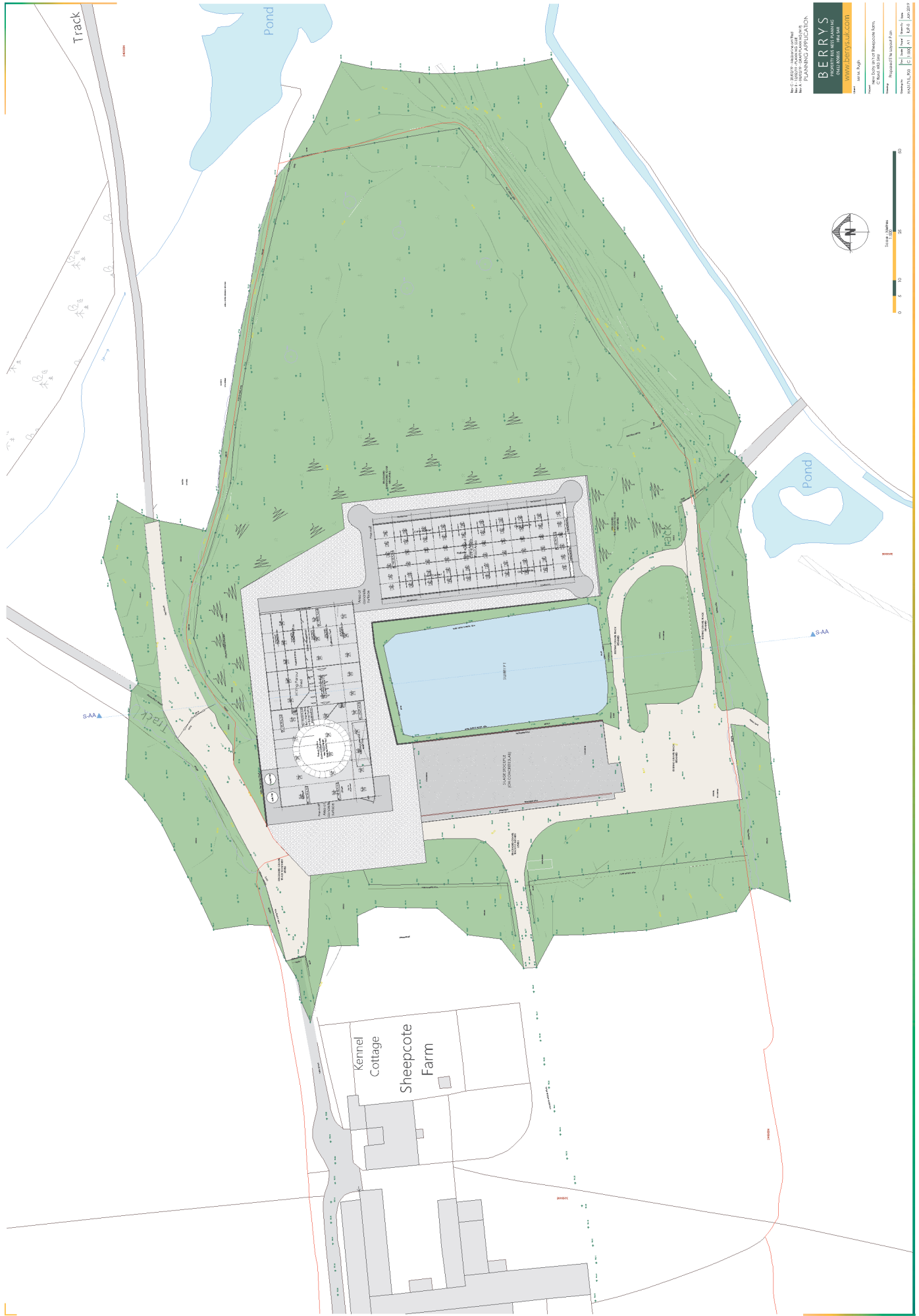
<sup>2</sup> <http://webarchive.nationalarchives.gov.uk/20140711133551/http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx>



## APPENDIX D







## APPENDIX E



**From:** Jo Milborrow  
**To:** [REDACTED]  
**Subject:** RE: Local Wildlife Site Search Request  
**Date:** 11 December 2019 14:15:20  
**Attachments:** [image004.png](#)  
[image007.png](#)  
[image002.png](#)

---

Hi Matt,

Thanks for your enquiry. I've had a look at the site with a 2km buffer and there is only 0.5km<sup>2</sup> within BIS area, the rest is within Herefordshire.

I have searched the 0.5km<sup>2</sup> and can confirm there are no SINC's or LWS within the area.

As it was such a tiny search area and there are no results to present to you, we will not charge for this search.

Kind regards,

Jo

**Jo Milborrow (Data Officer)**



- Use the [LERC Wales App](#) to record any species on the go in Wales
- Submit your wildlife sightings to BIS using [WiReD](#)
- Sign up to our BIS Newsletter email (about 1 a week) on the [BIS website homepage](#)
- Follow us on [Facebook](#) and [Twitter](#)
- View a summary of species records in your area using [Aderyn](#)

**Biodiversity Information Service for Powys and BBNP**  
**Local Environmental Records Centre Wales Ltd**  
6 THE BULWARK  
BRECON  
POWYS  
LD3 7LB

Tel: 01874 610881  
Website: [www.bis.org.uk](http://www.bis.org.uk)

---

**From:** [REDACTED]  
**Sent:** 10 December 2019 12:58  
**To:** BIS Information <[info@bis.org.uk](mailto:info@bis.org.uk)>  
**Subject:** Local Wildlife Site Search Request

Dear Sir / Madam,

I am looking to obtain details or the location (and description) of any site of local conservation interest (such as local wildlife sites) within 2km of OS GR 325928,246700. This includes an area of Powys as well as Herefordshire (I have contacted them separately). Are you able to provide this information?

Please note that I have already obtained the details of European sites, SSSI and ancient woodlands from MAGIC.

Many thanks

Matt Stoling  
Director  
Isopleth Ltd.

Tel: 01225 400085  
Mob: 07903 336625  
[www.isopleth.co.uk](http://www.isopleth.co.uk)



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Herefordshire Archive and Records Centre, Fir Tree Lane, Rotherwas, Hereford, HR2 6LA  
*Telephone: (01432) 261538, Email enquiries: [hbrc@herefordshire.gov.uk](mailto:hbrc@herefordshire.gov.uk)*

Matt Stoealing  
Isopleth Ltd  
Ulverston  
53 Englishcombe Lane  
Bath  
BA2 2EE

19<sup>th</sup> December 2019

Our reference: 3492

Dear Matt,

**SO2592846700**

## **DESIGNATED SITES**

Further to your request, I have conducted a search of the database for the area you identified. I have produced a map indicating locally designated sites and have provided register details for the relevant sites:

A Locksters Pool Local Geological Site

Please contact Moira Jenkins at Herefordshire and Worcestershire Earth Heritage Trust for further information: [m.jenkins@worc.ac.uk](mailto:m.jenkins@worc.ac.uk).

B Rhydspence Woodland Herefordshire Wildlife Trust Reserve

Please contact Herefordshire Wildlife Trust if you require further information.

C Clifford Common Herefordshire Wildlife Trust Reserve

Please contact Herefordshire Wildlife Trust if you require further information.

D Roadside Verge Nature Reserve 24

Good grassland flora including, cowslip (*Primula veris*), and burnet saxifrage (*Pimpinella saxifraga*).  
Annual Report 2000 (Herefordshire Nature Trust)

SO24/03 Three fields near Woodspring, and Cwm yr Afr SWS

The register states: "Three unimproved pastures with a rich flora including the rare autumn lady's-tresses. The adjoining woodland follows a deeply incised valley and has a variety of trees with a good ground flora which includes orchids and common cow-wheat."

Date 1990



**SO24/05 Clifford Common SWS**

The register states: "This site is owned and managed by the Herefordshire Nature Trust. A riverside scrub-invaded meadow, which is subject to flooding. It forms an excellent habitat for birds, and otters are known to visit this site."

Date 1990

**SO24/06 Rhydspence Plantation and adjoining sites SWS**

The register states: "An ancient woodland with a small amount of introduced species and a good ground flora in places.

The adjoining grassland is unimproved with a varied flora which includes devil's-bit scabious."

Date 1990

**SO24/07 Ton Wood SWS**

The register states: "An ancient semi-natural wood, mostly oak with hazel and hawthorn."

Date 1990

**SO24/11 Woodlands and meadow south of Brilley SWS**

The register states: "Brilley Green Dingle. The Wood. Kiln Ground, Common, Freeman's and Whitney Woods. Ferney Ground Covert.

An area of ancient woodland, with some interplanting. There is a good variety of trees, shrubs and ground flora. Species include oak, field maple, wood-sorrel, hard fern and orchids.

The meadow has a rich flora, including large bellflower and burnet-saxifrage.

The site supports a number of species of birds and there is a bat roost in Brilley Green Chapel."

Date 1990

**SO24/28 Sunny Bank Meadow SWS**

The register states: "An unimproved hay meadow. The ground flora includes yellow oat grass, great burnet, yellow rattle, ox eye daisy and common knapweed. Green-winged orchid has also been recorded."

Date 1993

**SO24/29 Land at the Nursery, Rhydspence SWS**

The register states: "An area of unimproved pasture with numerous anthills situated on steep south facing slopes. The ground flora includes quaking grass, cuckoo flower, pignut, wild thyme, cowslip and burnet saxifrage."

Date 1993

**SO24/30 Land at Woodside, Brilley SWS**

The register states: "A small wet pasture with anthills and some regenerating scrub. The flora present includes common knapweed, common spotted orchid, yellow rattle and ragged robin."

Date 1993

**SO53/06 River Wye SWS**

The register states: "The River Wye is one of the most celebrated and lovely rivers in Britain. From a nature conservation point of view, its national importance can be judged from the fact that it is one of the largest, relatively unpolluted, unmodified river systems in the country.

Throughout its length in Herefordshire, it follows a meandering course and is generally deep and slow-flowing.

Associated with the river is a rich variety of features such as kettlehole lakes and hollows with peat deposits, floodwater meadows, woodlands and shingle banks.

The Symonds Yat Gorge, formed by the river cutting through carboniferous limestone rock, is of national importance for its woodland flora.

The flora and fauna of the river as a whole is extremely rich: including Bewick's and whooper swans, sand pipers, sand martins and kingfishers, together with rich assemblages of insects. It is famous for salmon and trout but is also a habitat for two of our rarest fish species, allis and twaite shad.

Otters occur along the whole length of the river on its course through the county."

Date 1990

Please get in touch if you have any queries. I can confirm that the charge for the retrieval and analysis of your requests is £100 exclusive of VAT. You will receive an invoice from Herefordshire Council shortly: the Council handle all financial accounting on behalf of HBRC.

I hope that this information proves to be useful. I look forward to receiving new findings and biological records which any survey you undertake yields: this will help us to improve the information available for natural heritage conservation, research, advice, education and public information.

Yours sincerely,

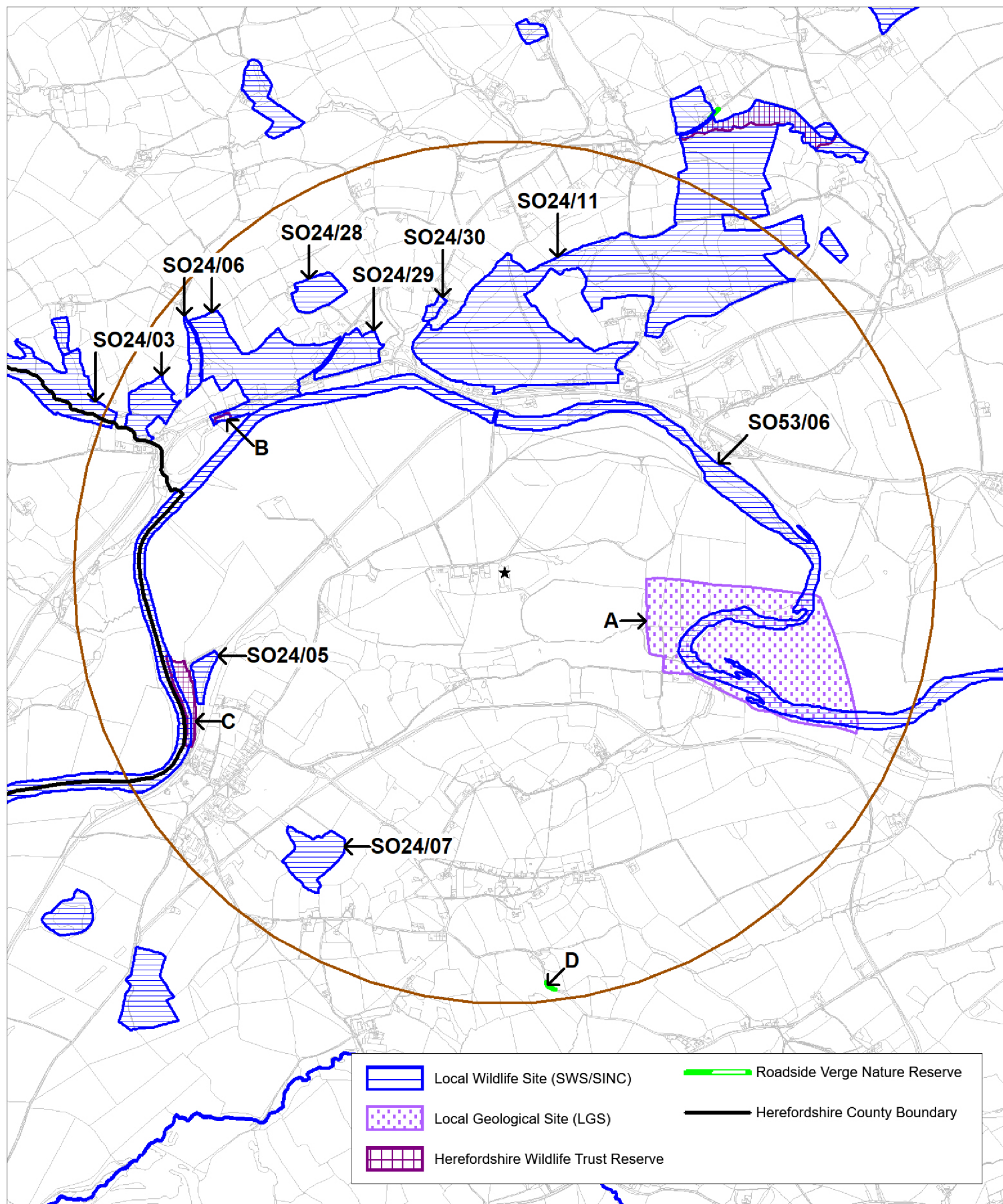
Jane Tavener  
Biological Data Officer (HBRC)  
Encs.

## **Terms and Conditions for the supply of data**

1. Copyright of all records remains with the recorder, and of the collated data with Herefordshire Biological Records Centre.
2. No copies of data are to be made for use by third parties, without written permission from Herefordshire Biological Records Centre.
3. Permission must be obtained in writing from Herefordshire Biological Records Centre if the data supplied is to be used for any other purpose than that described on the Data Request Form.
4. Data are provided subject to ongoing approval for use from individual recorders, local recording groups or national recording schemes. Should such providers of data withdraw permissions for use of these data, the requestor may be obliged to remove relevant data from records.
5. The data must not be entered onto a computerised database or GIS without permission from Herefordshire Biological Records Centre.
6. Herefordshire Biological Records Centre shall be acknowledged in any report relating to data supplied, and we would appreciate any details of biological records resulting from any survey undertaken.
7. Permission to use data expires 12 months after its supply. Applications to extend beyond this period should be made before the expiry date.
8. Data are as held by Herefordshire Biological Records Centre. Past records of presence of a species or habitat do not guarantee continued occurrence. Absence of records does not imply absence of a species, merely that no records are held.
9. Data are provided *without prejudice* and according to our Charging Policy, which is available on request. Commercial users are always subject to our Charging policy. Further to your request we will provide you with a quotation for processing of information and/or biological records; if this quotation is acceptable we will require approval in writing via letter or fax in order to proceed. Voluntary recording societies and local naturalists are generally exempted from this Policy.

*Present Charge Rates are based on £100 per hour, exclusive of VAT.*





Map showing locally designated sites  
within 2km of SO2592846700

**NORTH** SCALE 1:23,500



HEREFORDSHIRE  
BIOLOGICAL  
RECORDS  
CENTRE

Herefordshire Archive and Records Centre  
Fir Tree Lane  
Rotherwas  
Hereford  
HR2 6LA

Telephone: (01432) 261538  
Email: [hbrc@herefordshire.gov.uk](mailto:hbrc@herefordshire.gov.uk)



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