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MANURE MANAGEMANT PLAN

DEVELOPMENT: Erection of a poultry broiler unit (225,000 birds)

LOCATION: Land known as Cinders, Wynnstay Estate

APPLICANT: Soalter Ltd. Unit 1, Rose Hill, Erbistock, Wrexham, Ll13 0DE

DATE: April 2018

COMPLETED BY:

Williams Round Ltd
Ferndale
Weston Lullingfields
Shrewsbury
SY4 2AW
Tel: 01939 260302
Web: www.williamsround.co.uk

1. INTRODUCTION

The Manure Management Plan presented has been prepared to accompany the planning application for the erection of a 225,000 bird Poultry Unit.

The Water Code states that, to reduce leaching losses from manures, you should not apply more than 250 kg per ha of total nitrogen in organic manures in any 12 months. These are however guideline levels only and if a FACTS trained advisor can show that the crop requirements are higher the rates can be increased. The farm is not currently within a Nitrate Vulnerable Zone.

The farmland on the Estate is a mix of arable ground on medium soils which is contract farmed and used to grow a mix of winter combinable cereals and oil seed rape. The grassland areas are managed to silage or grazed by neighbouring dairy farmers cows in the summer months on licence. Some areas are not suitable for the application of manure **302.45 ha** of agricultural land is available to apply manures. This area has been calculated excluding the 'non spread areas' in order to meet the requirements of the relevant regulations.

2. PROPOSED DEVELOPMENT

The proposed development is for an erection of a 225,000 bird broiler poultry unit on land known as Cinders. The land is currently under a mix of arable and permanent pasture. The land currently in arable production is contract- farmed in-hand. The grassland on the holding is productive and is regularly used to make two to three silage cuts each year followed by aftermath grazing where required. This management results in the land having a high requirement for organic manures.

3. LAND AVAILABLE / MANURE RISK PLAN

The manure management plan has been prepared for a proposed total stock of 225,000 broilers although the development is only ever likely to house up to 200,000 birds at any one time. It also allows for areas on which manures should never be spread. These include ditches and watercourses: Within at least 10 metres (11 yards) of either side of any watercourse including ditches and piped ditches. This will avoid direct spreading into the watercourse and also reduce the risk of run-off reaching the watercourse. These areas are shown in red on the attached risk maps and are not eligible to be used for spreading.

Other non-spreading (red) areas include:

- Within at least 50 metres (55 yards) of any spring, well, borehole or reservoir that supplies water for human consumption or farm dairies.
- Very steep slopes where run-off is a high risk throughout the year.
- Any areas where you may not be allowed to spread for reasons such as a tenancy agreement, an abatement notice due to smell, set-aside land, Sites of Special Scientific Interest (SSSIs) or Environmentally Sensitive Areas (ESAs). (none of these are present on the holding although it should be noted that land that is available for spreading has been omitted from the application area due to presence of sensitive receptors such as dwellings etc – these areas will be avoided).
- The surface is rocky or uneven and therefore where equipment cannot be used effectively or safely.

A Manure Management plan/risk map has been produced (Maps - Appendix 1). In addition to identifying no-spread areas, high risk areas and those areas of the farm that are suitable for applications of manures for most of the year, the plan also assesses the amount of land available to take the manures produced. The map is colour coded as follows: -

Red = No-spread areas, e.g. yards; within 10 metres of a watercourse or 50 metres of a borehole, spring or well used for drinking or parlour washings. Or Areas not normally used for operational reasons but may be brought into use in the future.

Orange = Very High Risk. Steeply sloping fields of gradients 1 in 7 to 1 in 5; fields at risk of flooding; sandy or shallow soil over fissured rock; fields were drains have been installed during the past 12 months; poorly drained or waterlogged land; severely compacted soils, etc.

Yellow = High Risk. Slopes between 1 in 14 to 1 in 8; land sloping towards watercourses; imperfectly drained land.

Hatched Dark Green = Lower Risk with Caution. This land may have manure applied to it but care must be taken prior to application of manure, that no flood warnings have been raised or that excessive rainfall is forecast within 48 hours of the proposed application.

Green = Low Risk. Remainder of land upon which manures are applied and which has not been subsoiled or mole ploughed within the past 12 months.

Table 1 – Land available for spreading

Field NG Reference	Total Field Area(ha)	Non-spreading area	Area available for spreading
Cinders			
3784	3.66		3.66
3367	1.5		1.5
5708	4.71		4.71
9208	6.66	0.25	6.41
9092	6.27	0.25	6.02
1985	4.07	0.2	3.87
1969	1.97	0.1	1.87
3156	2.09		2.09
5974	3.71		3.71
3204	6.92	0.2	6.72
Fields Farm			
3636	2.08	0.1	1.98
3494	4.92	0.1	4.82
6163	2.93	0.1	2.83
8867	5.59	0.2	5.39
0.661	2.49	0.2	2.29
8340	7.12	0.33	6.79
9325	2.08		2.08
2647	2.75	0.1	2.65
2638	0.36	0.1	0.26
1328	1.12		1.12
0411	2.48		2.48
1717	2.49		2.49
3221	2.13		2.13
4627	4.92	0.15	4.77
Ruabon			
6388	13.65	0.15	13.5
3571	15.09	0.2	14.89
4534	9.77	0.15	9.62
9926	3.13	0.45	2.68
0688	15.11	0.3	14.81
0153	8.46	0.6	7.86
9065	7.72	0.1	7.62
1694	12.7	0.5	12.2

4814	18.99	0.6	18.39
8029	5.38	0.3	5.08
4246	5.63	0.35	5.28
2268	3.55		3.55
4301	0.85	0.1	0.75
9624	7.73	0.2	7.53
3211	13.28	0.32	12.96
2987	8.35	0.5	7.85
Additional			
8738	4.56		4.56
0302	2	0.2	1.8
0484	4.85	0.2	4.65
0954	6.26	0.1	6.16
0540	2	0.1	1.9
1027	2.04		2.04
1729	0.17		0.17
3336	2.98		2.98
4043	1.33		1.33
2108	6.39		6.39
2384	3.71	0.15	3.56
2268	2.29		2.29
4680	8.14	0.2	7.94
4103	3.18	0.2	2.98
5310	3.01		3.01
9103	11.23	0.3	10.93
5974	10.19	0.2	9.79
2098	2.76	0	2.76
		Area Available for spreading	**302.45 ha**

4. MANURE APPLICATION RATES AND NUTRIENT LOADING

All of the land on the Estate available and to be used for spreading is located outside of Nitrate Vulnerable Zones and hence is allowed up to 250kg/N loading per hectare.

It is confirmed that manure will be spread according to the annual cropping plan. Manure will be tested and analysed on a regular basis so that quantities applied will mean that applications will concur with crop requirements as laid out in DEFRA document RB209.

As shown in Table 1 above, the total amount of manure (N) that can be applied over the spreadable land on the farm will be **302.45 hectares x 250kg = 75,612.50 Kg/N**. The maximum total produced on the farm is **74,250 kgN,** (Table 2).

Table 2:

Unit	Stock Numbers	Kg N per Stock Unit	Total Kg N Produced
1000 broiler places	225	330	74,250
Total Kg N produced			**74,250**

Taking the above spreading rates/areas into account, it is concluded that the Estate farm has sufficient capacity to dispose of all manure produced by the proposed new enterprise in accordance with all the relevant regulations and legislation Including the Codes of Good Agricultural and Environmental Condition, Cross Compliance Regulations.

5.0. STORAGE/SPREADING OF MANURE

Manures will be stored and spread in accordance with the water, soil and air Codes of Good Agricultural Practice.

Manures will be stored manure heaps directly adjacent to the proposed poultry buildings as shown on the attached plan (marked *) and will be densely packed with an 'A' shaped profile.

There will also be wash water holding tanks directly next to the housing on site. The wash water holding tanks will be sufficiently sized to accommodate all of the wash water from crop wash down and in the event of disease breakout all wash water will be treated as hazardous waste and will be removed from the site by a licenced operator.

If required to be heaped out in arable/grass fields for short periods prior to spreading manure heaps will be placed well away from water courses, drainage schemes and ditches.

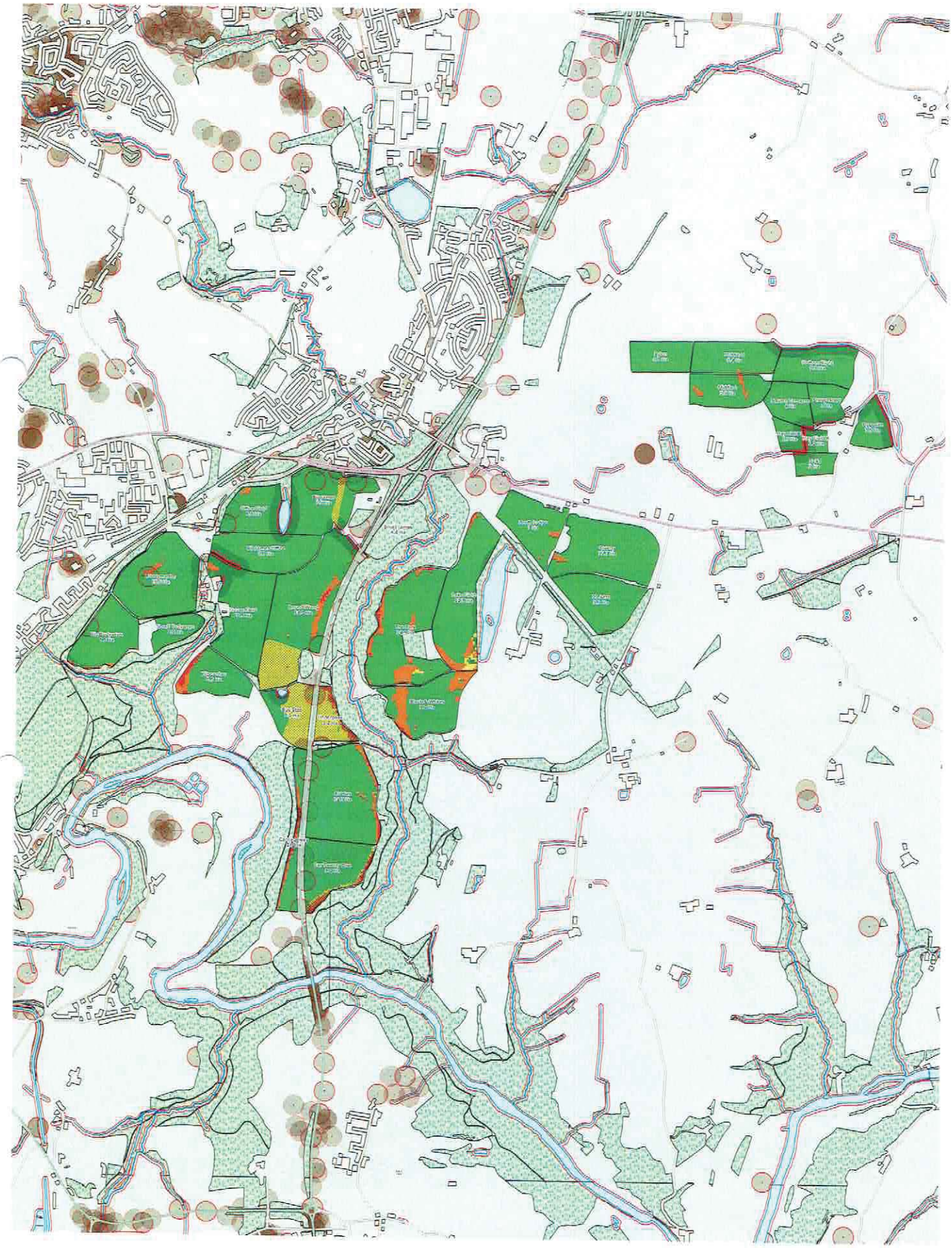
Manure will be spread under suitable conditions - Wind direction will be chosen to be blowing with prevailing direction from the west, which will blow any odours away from the closest dwellings. - The ground to receive the manure will not be water logged or frozen. - Spreading will be done at least 10 metres away from any watercourses or ditches

Manure will be incorporated in the soil within 24 hours of application, where this is possible due to conditions.

The Estate may also export the manures in certain years as and when a local market is available. Therefore it is highly likely that not all land will be required for spreading each year. In addition, the Estate reserves the right to use alternative land for spreading as the business develops and tenancy arrangements change.

Annex 1 – Manure Management Risk Maps

NVZ Manure Risk Map
Wynnstay & Cinders



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Guidance for Farmers in Nitrate Vulnerable Zones

Field application of organic manures

Orange areas
(numbered 1, 2, 3 or 4)
Very high risk

Red areas
(numbered 4 where necessary)
Land where organic manure should never be spread

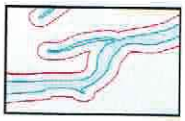
Yellow areas
(numbered 4 where necessary)
High risk

Cross-hatched areas
Identifies sandy or shallow soils

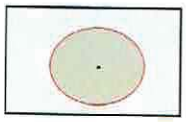
Green areas
Lower risk

White areas
Land not normally used for spreading

Green areas
Low risk



10m border around surface water



50m border around boreholes

Key for numbered coloured areas:

1. You should not spread on these fields when the surface is compacted or waterlogged
2. You should not spread when there is a risk of flooding
3. You should not spread when the soil is at field capacity i.e. when the soil is fully wetted
4. A field or part field with effective pipe or mole drains

Conditions leading to very high and high risk areas	Colour Map	Numbers for coloured
Fields or part fields next to a watercourse, spring or borehole when the surface is severely compacted [i] or waterlogged.	Orange	1
Fields or part fields that are likely to flood sometime in most winters.	Orange	2
Field or part fields next to a watercourse, spring or borehole when the soil is at field capacity [ii] (in winter) and there is:		
a steep slope	Orange	3
a moderate slope and a slowly permeable soil (i.e. a clay soil or one through which water passes only slowly)	Orange	3
a moderate slope and a well-drained soil	Yellow	
a slight slope and a slowly permeable soil	Yellow	
All fields or part fields with effective pipe or mole drains that are not already coloured red or orange (see extra limitations below [iii]).	Yellow	4
Very shallow soils (less than 30 cm) over gravel or rock, e.g. limestone, chalk, slates and shales.	Yellow	

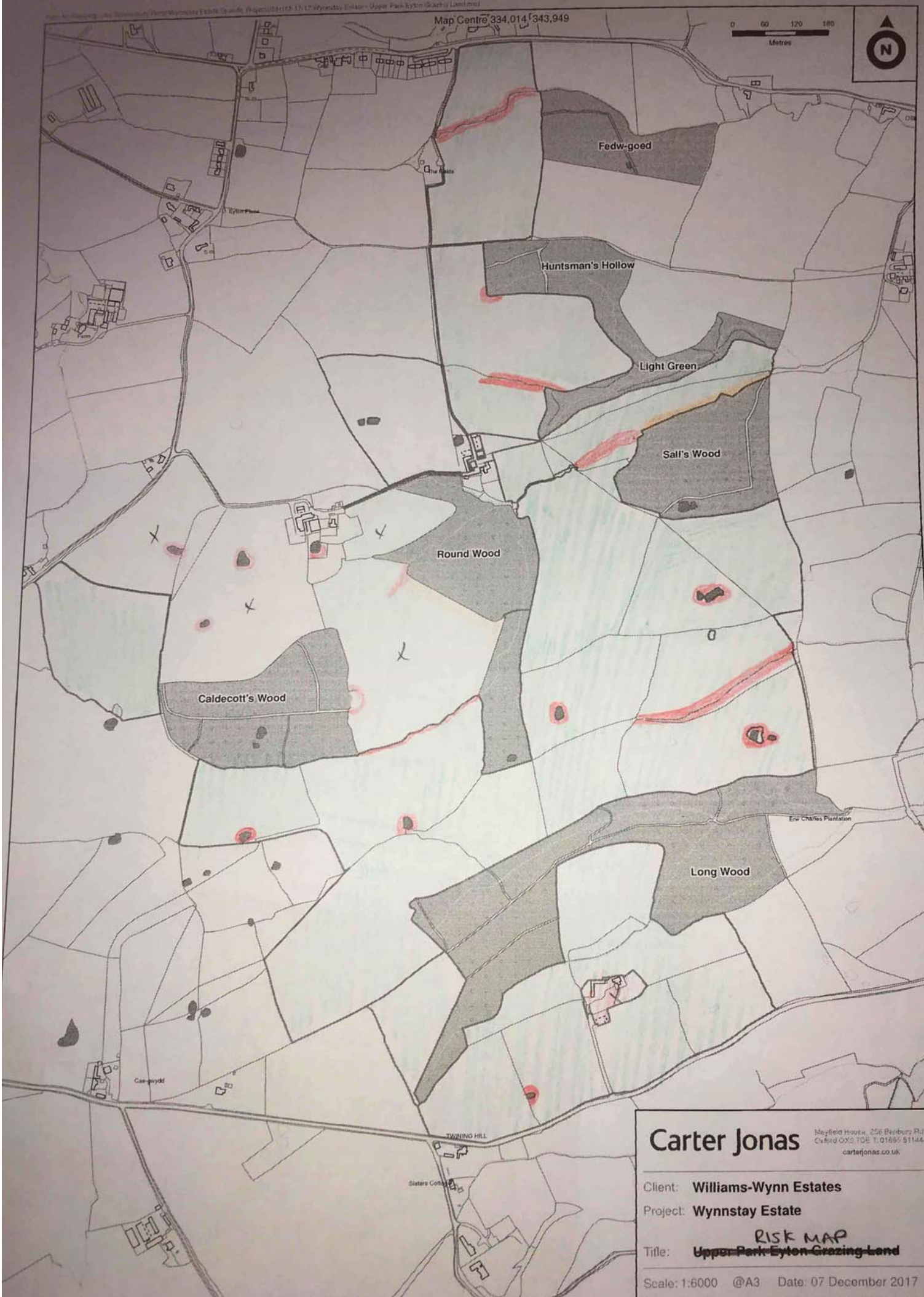
Notes:

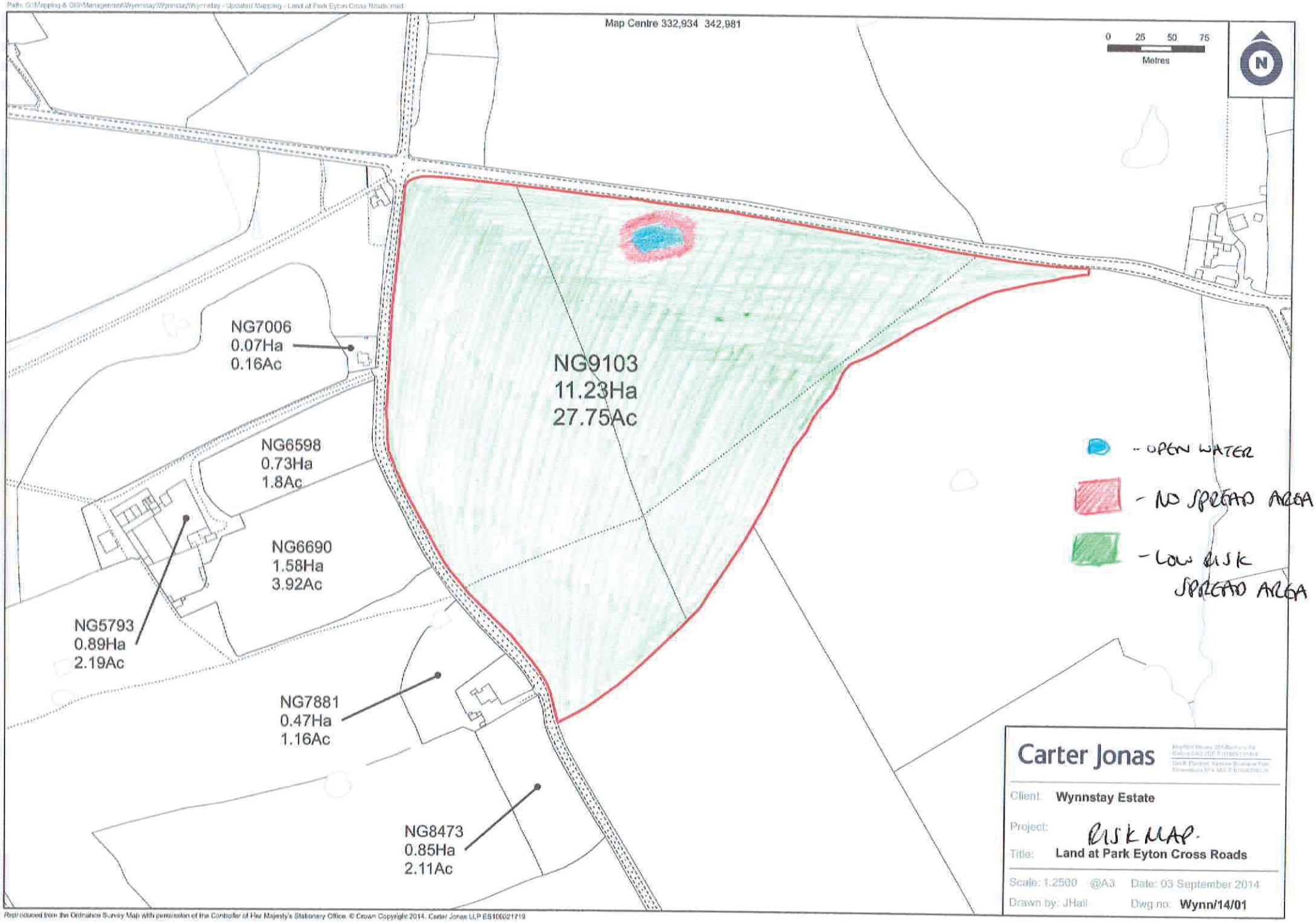
i – Severely compacted is when rain stays on the surface after rainfall.

ii - 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.

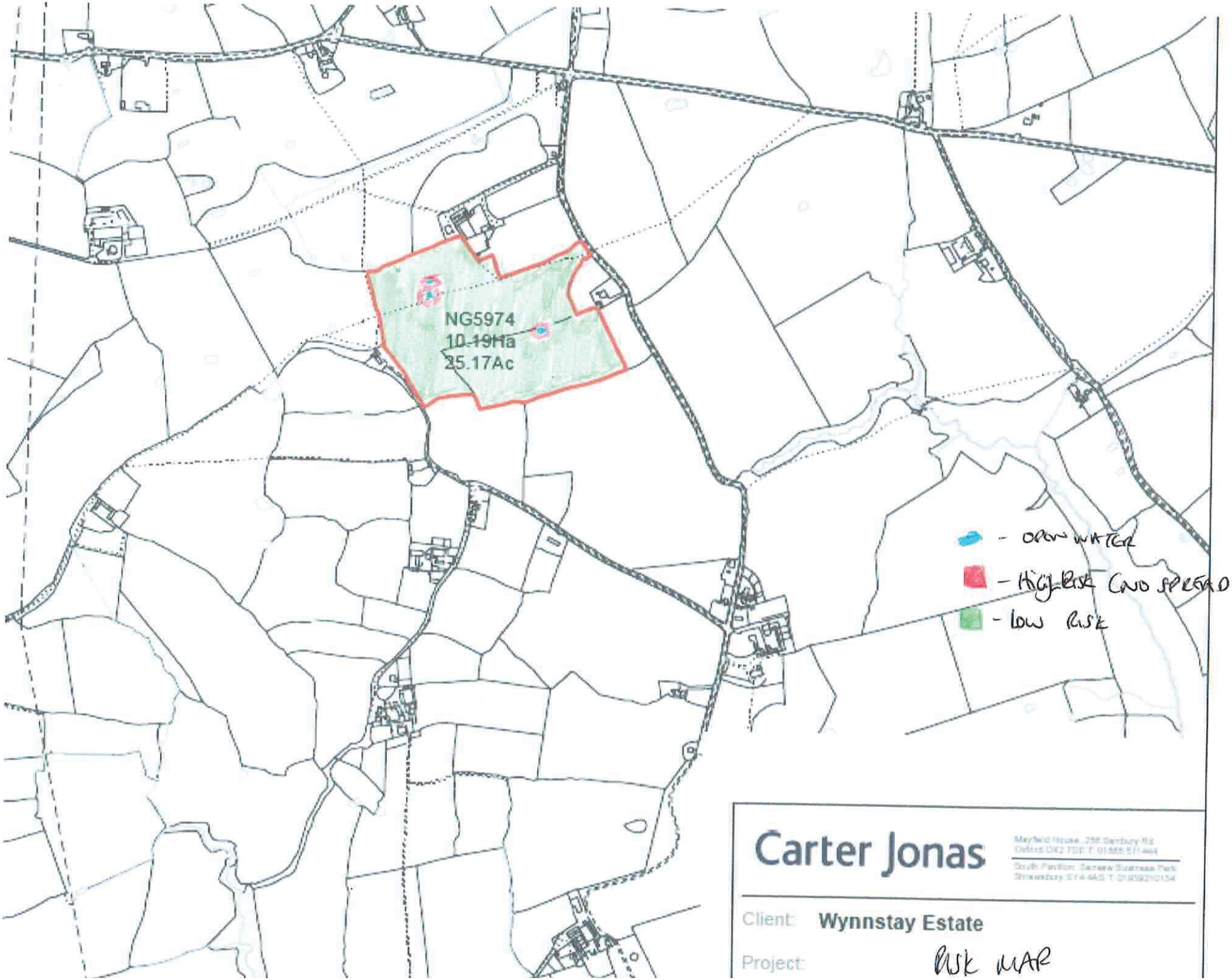
iii - Fields or part fields which in the last 12 months have been pipe drained, mole drained or sub-soiled over drains should not be used for spreading.

Spring, wells and land drains are currently not available. Boreholes are all marked, but may not all be relevant. Please check your map for any missing water features and update accordingly.


Map Centre 334,014 343,949
0 60 120 180
Metres
N
Fedw-goed
Huntsman's Hollow
Light Green
Sall's Wood
Round Wood
Caldecott's Wood
Long Wood
Twining Hill
Carter Jonas
Mayfield House, 256 Banbury Rd
Oxford OX2 7DE T: 01865 511444
carterjonas.co.uk
Client: Williams-Wynn Estates
Project: Wynnstay Estate
Title: ~~Upper Park Eyton Grazing Land~~ RISK MAP
Scale: 1:6000 @A3 Date: 07 December 2017



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NG5974
10.19Ha
25.17Ac
- OPEN WATER
- HIGH RISK GND SPEED AREA
- LOW RISK
Carter Jonas
Client: Wynnstay Estate
Project: RISK MAP

Appendix 4.1

Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

Direction : NORTHBOUND

Monday 03/07/2017	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	1	0	0	0	0	0	0	0	0	0	0	0	1
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	2	2	0	0	0	0	0	0	0	0	0	0	0	4
9	2	1	0	0	0	0	0	0	0	0	0	0	0	3
10	6	0	0	0	0	0	0	0	0	0	0	0	0	6
11	1	0	0	0	0	0	0	0	0	0	0	0	0	1
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	1	0	0	0	0	0	0	0	0	0	0	0	0	1
14	4	0	0	0	0	0	0	0	0	0	0	0	0	4
15	3	1	0	0	0	0	0	0	0	0	0	0	0	4
16	2	1	0	0	0	0	0	0	0	0	0	0	0	3
17	1	0	0	0	0	0	0	0	0	0	0	0	0	1
18	3	1	0	0	0	0	0	0	0	0	0	0	0	4
19	3	0	0	0	0	0	0	0	0	0	0	0	0	3
20	1	0	0	0	0	0	0	0	0	0	0	0	0	1
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	1	0	0	0	0	0	0	0	0	0	0	0	0	1
23	1	0	0	0	0	0	0	0	0	0	0	0	0	1
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-19	28	6	0	0	0	0	0	0	0	0	0	0	0	34
6-22	30	6	0	0	0	0	0	0	0	0	0	0	0	36
6-24	31	6	0	0	0	0	0	0	0	0	0	0	0	37
0-24	31	7	0	0	0	0	0	0	0	0	0	0	0	38

Direction : SOUTHBOUND

Monday 03/07/2017	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	1	0	0	0	0	0	0	0	0	0	0	0	1
8	1	1	0	0	0	0	0	0	0	0	0	0	0	2
9	4	1	0	0	0	0	0	0	0	0	0	0	0	5
10	1	0	0	0	0	0	0	0	0	0	0	0	0	1
11	2	1	0	0	0	0	0	0	0	0	0	0	0	3
12	1	0	0	0	0	0	0	0	0	0	0	0	0	1
13	2	1	0	0	0	0	0	0	0	0	0	0	0	3
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	1	0	0	0	0	0	0	0	0	0	0	0	1
16	2	0	0	0	0	0	0	0	0	0	0	0	0	2
17	5	0	0	0	0	0	0	0	0	0	0	0	0	5
18	7	0	0	0	0	0	0	0	0	0	0	0	0	7
19	1	0	0	0	0	0	0	0	0	0	0	0	0	1
20	3	0	0	0	0	0	0	0	0	0	0	0	0	3
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7-19	26	5	0	0	0	0	0	0	0	0	0	0	0	31
6-22	29	6	0	0	0	0	0	0	0	0	0	0	0	35
6-24	30	6	0	0	0	0	0	0	0	0	0	0	0	36
0-24	30	6	0	0	0	0	0	0	0	0	0	0	0	36

Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

Direction : NORTHBOUND

Monday 03/07/2017	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	1	0	0	0	0	0	0	0	0	0	1
7	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	2	2	0	0	0	0	0	0	0	0	0	4
9	0	1	2	0	0	0	0	0	0	0	0	0	3
10	0	5	1	0	0	0	0	0	0	0	0	0	6
11	1	0	0	0	0	0	0	0	0	0	0	0	1
12	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	1	0	0	0	0	0	0	0	0	0	1
14	0	0	4	0	0	0	0	0	0	0	0	0	4
15	0	3	1	0	0	0	0	0	0	0	0	0	4
16	0	0	2	1	0	0	0	0	0	0	0	0	3
17	0	0	1	0	0	0	0	0	0	0	0	0	1
18	0	1	3	0	0	0	0	0	0	0	0	0	4
19	0	0	2	1	0	0	0	0	0	0	0	0	3
20	0	0	0	1	0	0	0	0	0	0	0	0	1
21	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	1	0	0	0	0	0	0	0	0	1
23	0	0	1	0	0	0	0	0	0	0	0	0	1
24	0	0	0	0	0	0	0	0	0	0	0	0	0

7-19	1	12	19	2	0	0	0	0	0	0	0	0	34
6-22	1	12	19	4	0	0	0	0	0	0	0	0	36
6-24	1	12	20	4	0	0	0	0	0	0	0	0	37
0-24	1	12	21	4	0	0	0	0	0	0	0	0	38

Direction : SOUTHBOUND

Monday 03/07/2017	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	1	0	0	0	0	0	0	0	0	0	1
8	0	1	1	0	0	0	0	0	0	0	0	0	2
9	0	2	3	0	0	0	0	0	0	0	0	0	5
10	0	0	1	0	0	0	0	0	0	0	0	0	1
11	0	3	0	0	0	0	0	0	0	0	0	0	3
12	0	1	0	0	0	0	0	0	0	0	0	0	1
13	0	1	2	0	0	0	0	0	0	0	0	0	3
14	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	1	0	0	0	0	0	0	0	0	0	0	1
16	0	1	1	0	0	0	0	0	0	0	0	0	2
17	0	3	2	0	0	0	0	0	0	0	0	0	5
18	0	2	5	0	0	0	0	0	0	0	0	0	7
19	0	0	0	1	0	0	0	0	0	0	0	0	1
20	0	1	2	0	0	0	0	0	0	0	0	0	3
21	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	1	0	0	0	0	0	0	0	0	0	1

7-19	0	15	15	1	0	0	0	0	0	0	0	0	31
6-22	0	16	18	1	0	0	0	0	0	0	0	0	35
6-24	0	16	19	1	0	0	0	0	0	0	0	0	36
0-24	0	16	19	1	0	0	0	0	0	0	0	0	36

Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

Direction : NORTHBOUND

Tuesday 04/07/2017	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	1	0	0	0	0	0	0	0	0	0	0	0	1
7	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8	3	0	0	0	0	0	0	0	0	0	0	0	0	3
9	3	1	0	0	0	0	0	0	0	0	0	0	0	4
10	2	1	0	0	0	0	0	0	0	0	0	0	0	3
11	2	0	0	0	0	0	0	0	0	0	0	1	0	3
12	2	1	0	0	0	0	0	0	0	0	0	0	0	3
13	1	1	0	0	0	0	0	0	0	0	1	0	0	3
14	1	1	0	0	0	0	0	0	0	0	0	0	0	2
15	0	0	0	0	0	0	0	0	0	0	1	0	0	1
16	2	1	0	0	0	0	0	0	0	0	0	0	0	3
17	6	2	0	0	0	0	0	0	0	0	0	0	0	8
18	2	1	0	0	0	0	0	0	0	0	0	0	0	3
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	2	0	0	0	0	0	0	0	0	0	0	0	0	2
21	1	0	0	0	0	0	0	0	0	0	0	0	0	1
22	1	1	0	0	0	0	0	0	0	0	0	0	0	2
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	1	0	0	0	0	1
7-19	24	9	0	0	0	0	0	0	0	0	2	1	0	36
6-22	29	10	0	0	0	0	0	0	0	0	2	1	0	42
6-24	29	10	0	0	0	0	0	0	1	0	2	1	0	43
0-24	29	11	0	0	0	0	0	0	1	0	2	1	0	44

Direction : SOUTHBOUND

Tuesday 04/07/2017	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7	1	1	0	0	0	0	0	0	0	0	0	0	0	2
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	3	0	0	0	0	0	0	0	0	0	0	0	0	3
10	1	1	0	0	0	0	0	0	0	0	0	0	0	2
11	1	0	0	0	0	0	0	0	0	0	0	0	0	1
12	2	2	0	0	0	0	0	0	0	0	0	0	0	4
13	0	1	0	0	0	0	0	0	0	0	0	0	0	1
14	0	0	0	0	2	0	0	0	0	0	0	0	0	2
15	1	0	0	0	0	0	0	0	0	0	0	0	0	1
16	1	1	0	0	1	0	0	0	0	0	0	0	0	3
17	4	2	0	0	0	0	0	0	0	0	0	0	0	6
18	3	0	0	0	0	0	0	0	0	0	0	0	0	3
19	1	0	0	0	1	0	0	0	0	0	0	0	0	2
20	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7-19	17	7	0	0	4	0	0	0	0	0	0	0	0	28
6-22	18	8	0	0	4	0	0	0	0	0	0	0	0	30
6-24	19	8	0	0	4	0	0	0	0	0	0	0	0	31
0-24	20	8	0	0	4	0	0	0	0	0	0	0	0	32

Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

Direction : NORTHBOUND

Tuesday 04/07/2017	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	1	0	0	0	0	0	0	0	0	0	1
7	0	0	0	1	0	0	0	0	0	0	0	0	1
8	0	2	1	0	0	0	0	0	0	0	0	0	3
9	0	0	2	2	0	0	0	0	0	0	0	0	4
10	0	2	1	0	0	0	0	0	0	0	0	0	3
11	0	1	2	0	0	0	0	0	0	0	0	0	3
12	0	0	3	0	0	0	0	0	0	0	0	0	3
13	0	0	3	0	0	0	0	0	0	0	0	0	3
14	0	0	2	0	0	0	0	0	0	0	0	0	2
15	0	0	1	0	0	0	0	0	0	0	0	0	1
16	0	0	3	0	0	0	0	0	0	0	0	0	3
17	0	2	5	1	0	0	0	0	0	0	0	0	8
18	0	1	0	2	0	0	0	0	0	0	0	0	3
19	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	1	1	0	0	0	0	0	0	0	0	2
21	0	0	0	1	0	0	0	0	0	0	0	0	1
22	0	0	2	0	0	0	0	0	0	0	0	0	2
23	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	1	0	0	0	0	0	0	0	0	0	1
7-19	0	8	23	5	0	0	0	0	0	0	0	0	36
6-22	0	8	26	8	0	0	0	0	0	0	0	0	42
6-24	0	8	27	8	0	0	0	0	0	0	0	0	43
0-24	0	8	28	8	0	0	0	0	0	0	0	0	44

Direction : SOUTHBOUND

Tuesday 04/07/2017	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	1	0	0	0	0	0	0	0	0	0	1
7	0	1	1	0	0	0	0	0	0	0	0	0	2
8	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	2	1	0	0	0	0	0	0	0	0	0	3
10	0	2	0	0	0	0	0	0	0	0	0	0	2
11	0	0	1	0	0	0	0	0	0	0	0	0	1
12	0	3	1	0	0	0	0	0	0	0	0	0	4
13	0	1	0	0	0	0	0	0	0	0	0	0	1
14	0	1	1	0	0	0	0	0	0	0	0	0	2
15	0	0	1	0	0	0	0	0	0	0	0	0	1
16	0	1	2	0	0	0	0	0	0	0	0	0	3
17	0	3	3	0	0	0	0	0	0	0	0	0	6
18	0	1	0	1	1	0	0	0	0	0	0	0	3
19	0	0	2	0	0	0	0	0	0	0	0	0	2
20	0	0	0	0	0	0	0	0	0	0	0	0	0
21	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	1	0	0	0	0	0	0	0	1
7-19	0	14	12	1	1	0	0	0	0	0	0	0	28
6-22	0	15	13	1	1	0	0	0	0	0	0	0	30
6-24	0	15	13	1	2	0	0	0	0	0	0	0	31
0-24	0	15	14	1	2	0	0	0	0	0	0	0	32

Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

Direction : NORTHBOUND

Wednesday 05/07/2017	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8	2	0	0	0	0	0	0	0	0	0	0	0	0	2
9	2	1	0	0	0	0	0	0	0	0	0	0	0	3
10	2	0	0	0	0	0	0	0	0	0	0	0	0	2
11	5	0	0	0	0	0	0	0	0	0	0	0	0	5
12	0	0	0	0	0	0	0	0	1	0	0	0	0	1
13	3	1	0	0	0	0	0	0	0	0	0	0	0	4
14	2	0	0	0	0	0	0	0	0	0	0	0	0	2
15	2	0	0	0	0	0	0	0	0	0	0	0	0	2
16	1	0	0	0	0	0	0	0	0	0	0	0	0	1
17	3	0	0	0	0	0	0	0	0	0	0	0	0	3
18	2	0	0	0	0	0	0	0	0	0	0	0	0	2
19	2	0	0	0	0	0	0	0	0	0	0	0	0	2
20	2	0	0	0	0	0	0	0	0	0	0	0	0	2
21	2	0	0	0	0	0	0	0	0	0	0	0	0	2
22	3	0	0	0	0	0	0	0	0	0	0	0	0	3
23	1	0	0	0	0	0	0	0	0	0	0	0	0	1
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-19	26	2	0	0	0	0	0	0	1	0	0	0	0	29
6-22	34	2	0	0	0	0	0	0	1	0	0	0	0	37
6-24	35	2	0	0	0	0	0	0	1	0	0	0	0	38
0-24	36	2	0	0	0	0	0	0	1	0	0	0	0	39

Direction : SOUTHBOUND

Wednesday 05/07/2017	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	2	0	0	0	0	0	0	0	0	0	0	0	0	2
10	3	1	0	0	0	0	0	0	0	0	0	0	0	4
11	3	0	0	0	0	0	0	0	1	0	0	0	0	4
12	2	0	0	0	0	0	0	0	0	0	0	0	0	2
13	2	0	0	0	0	0	0	0	0	0	0	0	0	2
14	1	0	0	0	0	0	0	0	0	0	0	0	0	1
15	1	0	0	0	0	0	0	0	0	0	0	0	0	1
16	5	0	0	0	0	0	0	0	0	0	0	0	0	5
17	6	0	0	0	0	0	0	0	0	0	0	0	0	6
18	5	0	0	0	0	0	0	0	0	0	0	0	0	5
19	5	0	0	0	0	0	0	0	0	0	0	0	0	5
20	1	0	0	0	0	0	0	0	0	0	0	0	0	1
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	1	0	0	0	0	0	0	0	0	0	0	0	0	1
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-19	35	1	0	0	0	0	0	0	1	0	0	0	0	37
6-22	38	1	0	0	0	0	0	0	1	0	0	0	0	40
6-24	38	1	0	0	0	0	0	0	1	0	0	0	0	40
0-24	38	1	0	0	0	0	0	0	1	0	0	0	0	40

Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

Direction : NORTHBOUND

Wednesday 05/07/2017	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	1	0	0	0	0	0	0	0	0	0	1
7	0	0	0	1	0	0	0	0	0	0	0	0	1
8	0	1	1	0	0	0	0	0	0	0	0	0	2
9	0	0	2	1	0	0	0	0	0	0	0	0	3
10	0	0	2	0	0	0	0	0	0	0	0	0	2
11	0	2	3	0	0	0	0	0	0	0	0	0	5
12	0	1	0	0	0	0	0	0	0	0	0	0	1
13	0	0	4	0	0	0	0	0	0	0	0	0	4
14	0	0	2	0	0	0	0	0	0	0	0	0	2
15	0	1	1	0	0	0	0	0	0	0	0	0	2
16	0	0	1	0	0	0	0	0	0	0	0	0	1
17	0	2	1	0	0	0	0	0	0	0	0	0	3
18	0	0	2	0	0	0	0	0	0	0	0	0	2
19	0	1	0	1	0	0	0	0	0	0	0	0	2
20	0	1	1	0	0	0	0	0	0	0	0	0	2
21	0	2	0	0	0	0	0	0	0	0	0	0	2
22	0	0	2	1	0	0	0	0	0	0	0	0	3
23	0	0	1	0	0	0	0	0	0	0	0	0	1
24	0	0	0	0	0	0	0	0	0	0	0	0	0
7-19	0	8	19	2	0	0	0	0	0	0	0	0	29
6-22	0	11	22	4	0	0	0	0	0	0	0	0	37
6-24	0	11	23	4	0	0	0	0	0	0	0	0	38
0-24	0	11	24	4	0	0	0	0	0	0	0	0	39

Direction : SOUTHBOUND

Wednesday 05/07/2017	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	1	0	0	0	0	0	0	0	0	0	1
8	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	2	0	0	0	0	0	0	0	0	0	2
10	0	1	3	0	0	0	0	0	0	0	0	0	4
11	0	2	2	0	0	0	0	0	0	0	0	0	4
12	0	0	2	0	0	0	0	0	0	0	0	0	2
13	0	1	1	0	0	0	0	0	0	0	0	0	2
14	0	0	1	0	0	0	0	0	0	0	0	0	1
15	0	1	0	0	0	0	0	0	0	0	0	0	1
16	0	0	5	0	0	0	0	0	0	0	0	0	5
17	0	2	4	0	0	0	0	0	0	0	0	0	6
18	0	1	2	0	2	0	0	0	0	0	0	0	5
19	1	2	2	0	0	0	0	0	0	0	0	0	5
20	0	0	1	0	0	0	0	0	0	0	0	0	1
21	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	1	0	0	0	0	0	0	0	0	0	0	1
23	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0
7-19	1	10	24	0	2	0	0	0	0	0	0	0	37
6-22	1	11	26	0	2	0	0	0	0	0	0	0	40
6-24	1	11	26	0	2	0	0	0	0	0	0	0	40
0-24	1	11	26	0	2	0	0	0	0	0	0	0	40

Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

Direction : NORTHBOUND

Thursday 06/07/2017	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	2	0	0	0	0	0	0	0	0	0	0	0	0	2
7	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8	3	0	0	0	0	0	0	0	0	0	0	0	0	3
9	5	0	0	0	0	0	0	0	0	0	0	0	0	5
10	2	0	1	0	1	0	0	0	0	0	0	0	0	4
11	1	1	0	0	0	0	0	0	0	0	0	0	0	2
12	1	0	0	1	0	0	0	0	0	0	0	0	0	2
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	3	0	0	0	0	0	0	0	0	0	0	0	0	3
15	3	1	0	0	0	0	0	0	0	0	0	0	0	4
16	2	1	0	0	0	0	0	0	0	0	0	0	0	3
17	4	0	0	0	0	0	0	0	0	0	0	0	0	4
18	2	0	0	0	0	0	1	0	0	0	0	0	0	3
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	2	0	0	0	0	0	0	0	0	0	0	0	0	2
21	1	1	0	0	0	0	0	0	0	0	0	0	0	2
22	2	0	0	0	0	0	0	0	0	0	0	0	0	2
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7-19	26	3	1	1	1	0	1	0	0	0	0	0	0	33
6-22	32	4	1	1	1	0	1	0	0	0	0	0	0	40
6-24	32	4	1	1	1	0	1	0	0	0	0	0	0	40
0-24	36	4	1	1	1	0	1	0	0	0	0	0	0	44

Direction : SOUTHBOUND

Thursday 06/07/2017	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	3	0	0	0	0	0	0	0	0	0	0	0	0	3
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8	1	0	0	0	0	0	0	0	0	0	0	0	0	1
9	3	0	0	0	0	0	0	0	0	0	0	0	0	3
10	3	0	0	0	0	0	0	0	0	0	0	0	0	3
11	3	0	1	0	0	0	0	0	0	0	0	0	0	4
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	3	0	0	0	0	0	0	0	0	0	0	0	0	3
15	3	0	0	0	0	0	0	0	0	0	0	0	0	3
16	2	0	0	0	0	0	0	0	0	0	0	0	0	2
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	4	1	0	0	0	0	0	0	0	0	0	0	0	5
19	2	0	0	0	0	0	0	0	0	0	0	0	0	2
20	1	0	0	0	0	0	0	0	0	0	0	0	0	1
21	2	0	0	0	0	0	0	0	0	0	0	0	0	2
22	1	0	0	0	0	0	0	0	0	0	0	0	0	1
23	1	0	0	0	0	0	0	0	0	0	0	0	0	1
24	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7-19	24	1	1	0	0	0	0	0	0	0	0	0	0	26
6-22	29	1	1	0	0	0	0	0	0	0	0	0	0	31
6-24	31	1	1	0	0	0	0	0	0	0	0	0	0	33
0-24	35	1	1	0	0	0	0	0	0	0	0	0	0	37

Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

Direction : NORTHBOUND

Thursday 06/07/2017	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	1	1	0	0	0	0	0	0	0	0	2
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	1	1	0	0	0	0	0	0	0	0	2
7	0	0	0	1	0	0	0	0	0	0	0	0	1
8	0	1	2	0	0	0	0	0	0	0	0	0	3
9	0	1	4	0	0	0	0	0	0	0	0	0	5
10	0	2	2	0	0	0	0	0	0	0	0	0	4
11	0	1	1	0	0	0	0	0	0	0	0	0	2
12	0	1	1	0	0	0	0	0	0	0	0	0	2
13	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	2	1	0	0	0	0	0	0	0	0	3
15	0	1	3	0	0	0	0	0	0	0	0	0	4
16	0	3	0	0	0	0	0	0	0	0	0	0	3
17	0	1	2	1	0	0	0	0	0	0	0	0	4
18	0	0	3	0	0	0	0	0	0	0	0	0	3
19	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	2	0	0	0	0	0	0	0	0	0	2
21	0	0	2	0	0	0	0	0	0	0	0	0	2
22	0	0	2	0	0	0	0	0	0	0	0	0	2
23	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	0	0	0	0	0	0	0	0	0
7-19	0	11	20	2	0	0	0	0	0	0	0	0	33
6-22	0	11	26	3	0	0	0	0	0	0	0	0	40
6-24	0	11	26	3	0	0	0	0	0	0	0	0	40
0-24	0	11	28	5	0	0	0	0	0	0	0	0	44

Direction : SOUTHBOUND

Thursday 06/07/2017	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	2	1	0	0	0	0	0	0	0	0	3
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	1	0	0	0	0	0	0	0	0	0	1
7	0	0	1	0	0	0	0	0	0	0	0	0	1
8	0	1	0	0	0	0	0	0	0	0	0	0	1
9	0	1	2	0	0	0	0	0	0	0	0	0	3
10	0	3	0	0	0	0	0	0	0	0	0	0	3
11	0	1	3	0	0	0	0	0	0	0	0	0	4
12	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	2	1	0	0	0	0	0	0	0	0	0	3
15	0	2	1	0	0	0	0	0	0	0	0	0	3
16	0	0	2	0	0	0	0	0	0	0	0	0	2
17	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	2	2	1	0	0	0	0	0	0	0	0	5
19	0	1	1	0	0	0	0	0	0	0	0	0	2
20	0	0	1	0	0	0	0	0	0	0	0	0	1
21	0	2	0	0	0	0	0	0	0	0	0	0	2
22	0	1	0	0	0	0	0	0	0	0	0	0	1
23	0	0	1	0	0	0	0	0	0	0	0	0	1
24	0	0	0	1	0	0	0	0	0	0	0	0	1
7-19	0	13	12	1	0	0	0	0	0	0	0	0	26
6-22	0	16	14	1	0	0	0	0	0	0	0	0	31
6-24	0	16	15	2	0	0	0	0	0	0	0	0	33
0-24	0	16	18	3	0	0	0	0	0	0	0	0	37

Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

Direction : NORTHBOUND

Friday 07/07/2017	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8	1	0	0	0	0	0	0	0	0	0	0	0	0	1
9	3	0	0	0	0	0	0	0	0	0	0	0	0	3
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	3	0	0	0	0	0	0	0	0	0	0	0	0	3
13	5	1	0	0	0	0	0	0	0	0	0	0	0	6
14	1	0	0	0	0	0	0	0	0	0	0	0	0	1
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	3	0	0	0	0	0	1	0	0	0	0	0	0	4
17	4	2	0	0	0	0	0	0	0	0	0	0	0	6
18	4	0	0	0	0	0	0	0	0	0	0	0	0	4
19	3	0	0	0	0	0	0	0	1	0	0	0	0	4
20	0	1	0	0	0	0	0	0	0	0	0	0	0	1
21	1	0	0	0	0	0	0	0	0	0	0	0	0	1
22	3	0	0	0	0	0	0	0	0	0	0	0	0	3
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	1	0	0	0	0	0	0	0	0	0	0	0	1
7-19	27	3	0	0	0	0	1	0	1	0	0	0	0	32
6-22	32	4	0	0	0	0	1	0	1	0	0	0	0	38
6-24	32	5	0	0	0	0	1	0	1	0	0	0	0	39
0-24	33	5	0	0	0	0	1	0	1	0	0	0	0	40

Direction : SOUTHBOUND

Friday 07/07/2017	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	1	0	0	0	0	0	0	0	0	0	0	0	0	1
10	1	0	0	0	0	0	0	0	0	0	0	0	0	1
11	1	0	1	0	0	0	0	0	0	0	0	0	0	2
12	1	0	0	0	0	0	0	0	0	0	0	0	0	1
13	3	0	0	0	0	0	0	0	0	0	0	0	0	3
14	2	1	0	0	0	0	0	0	0	0	0	0	0	3
15	2	0	0	0	0	0	0	0	1	0	0	0	0	3
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	5	0	0	0	0	0	0	0	0	0	0	0	0	5
18	8	0	0	0	0	0	0	0	0	0	0	0	0	8
19	3	0	0	0	0	0	0	0	0	0	0	0	0	3
20	1	0	0	0	0	0	0	0	0	0	0	0	0	1
21	1	0	0	0	0	0	0	0	0	0	0	0	0	1
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7-19	27	1	1	0	0	0	0	0	1	0	0	0	0	30
6-22	30	1	1	0	0	0	0	0	1	0	0	0	0	33
6-24	31	1	1	0	0	0	0	0	1	0	0	0	0	34
0-24	33	1	1	0	0	0	0	0	1	0	0	0	0	36

Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

Direction : NORTHBOUND

Friday 07/07/2017	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	1	0	0	0	0	0	0	0	0	0	1
7	0	0	0	1	0	0	0	0	0	0	0	0	1
8	0	1	0	0	0	0	0	0	0	0	0	0	1
9	0	0	2	1	0	0	0	0	0	0	0	0	3
10	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	1	2	0	0	0	0	0	0	0	0	0	3
13	0	1	4	1	0	0	0	0	0	0	0	0	6
14	0	0	0	1	0	0	0	0	0	0	0	0	1
15	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	1	3	0	0	0	0	0	0	0	0	0	4
17	0	1	5	0	0	0	0	0	0	0	0	0	6
18	0	0	4	0	0	0	0	0	0	0	0	0	4
19	0	2	2	0	0	0	0	0	0	0	0	0	4
20	0	0	1	0	0	0	0	0	0	0	0	0	1
21	0	0	0	1	0	0	0	0	0	0	0	0	1
22	0	0	2	0	1	0	0	0	0	0	0	0	3
23	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	1	0	0	0	0	0	0	0	0	1
7-19	0	7	22	3	0	0	0	0	0	0	0	0	32
6-22	0	7	25	5	1	0	0	0	0	0	0	0	38
6-24	0	7	25	6	1	0	0	0	0	0	0	0	39
0-24	0	7	26	6	1	0	0	0	0	0	0	0	40

Direction : SOUTHBOUND

Friday 07/07/2017	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	1	0	0	0	0	0	0	0	0	1
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	1	0	0	0	0	0	0	0	0	1
7	0	0	1	0	0	0	0	0	0	0	0	0	1
8	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	1	0	0	0	0	0	0	0	0	0	1
10	0	0	1	0	0	0	0	0	0	0	0	0	1
11	0	1	1	0	0	0	0	0	0	0	0	0	2
12	0	0	1	0	0	0	0	0	0	0	0	0	1
13	0	2	1	0	0	0	0	0	0	0	0	0	3
14	0	1	2	0	0	0	0	0	0	0	0	0	3
15	0	3	0	0	0	0	0	0	0	0	0	0	3
16	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	3	1	1	0	0	0	0	0	0	0	0	5
18	0	2	6	0	0	0	0	0	0	0	0	0	8
19	0	1	2	0	0	0	0	0	0	0	0	0	3
20	0	1	0	0	0	0	0	0	0	0	0	0	1
21	0	0	1	0	0	0	0	0	0	0	0	0	1
22	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	0	0	1	0	0	0	0	0	0	0	1
7-19	0	13	16	1	0	0	0	0	0	0	0	0	30
6-22	0	14	18	1	0	0	0	0	0	0	0	0	33
6-24	0	14	18	1	1	0	0	0	0	0	0	0	34
0-24	0	14	18	3	1	0	0	0	0	0	0	0	36

Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

Direction : NORTHBOUND

Saturday 08/07/2017	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1	0	0	0	0	0	0	0	0	0	0	0	0	1
6	0	1	0	0	0	0	0	0	0	0	0	0	0	1
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	2	0	0	0	0	0	0	0	0	0	0	0	0	2
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	6	0	0	0	0	0	0	0	0	0	0	0	0	6
14	6	0	0	0	0	0	0	0	0	0	0	0	0	6
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	1	1	0	0	0	0	0	0	0	0	0	0	0	2
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	1	0	0	0	0	0	0	0	0	0	0	0	0	1
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0
20	2	0	0	0	0	0	0	0	0	0	0	0	0	2
21	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22	1	0	0	0	0	0	0	0	0	0	0	0	0	1
23	1	0	0	0	0	0	0	0	0	0	0	0	0	1
24	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7-19	16	1	0	0	0	0	0	0	0	0	0	0	0	17
6-22	19	1	0	0	0	0	0	0	0	0	0	0	0	20
6-24	21	1	0	0	0	0	0	0	0	0	0	0	0	22
0-24	22	2	0	0	0	0	0	0	0	0	0	0	0	24

Direction : SOUTHBOUND

Saturday 08/07/2017	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	1	0	0	0	0	0	0	0	0	0	0	0	0	1
10	5	0	0	0	0	0	0	0	0	0	0	0	0	5
11	1	0	0	0	0	0	0	0	0	0	0	0	0	1
12	1	0	0	0	1	0	0	0	0	0	0	0	0	2
13	5	0	0	0	0	0	0	0	0	0	0	0	0	5
14	5	0	0	0	0	0	0	0	0	0	0	0	0	5
15	2	0	0	0	0	0	0	0	0	0	0	0	0	2
16	3	0	0	0	0	0	0	0	0	0	0	0	0	3
17	1	0	0	0	0	0	0	0	0	0	0	0	0	1
18	1	1	0	0	0	0	0	0	0	0	0	0	0	2
19	1	0	0	0	0	0	0	0	0	0	0	0	0	1
20	1	0	0	0	0	0	0	0	0	0	0	0	0	1
21	1	0	0	0	0	0	0	0	0	0	0	0	0	1
22	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	1	0	0	0	0	0	0	0	0	0	0	0	0	1
24	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7-19	26	1	0	0	1	0	0	0	0	0	0	0	0	28
6-22	29	1	0	0	1	0	0	0	0	0	0	0	0	31
6-24	31	1	0	0	1	0	0	0	0	0	0	0	0	33
0-24	31	1	0	0	1	0	0	0	0	0	0	0	0	33

Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

Direction : NORTHBOUND

Saturday 08/07/2017	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	1	0	0	0	0	0	0	0	1
6	0	0	1	0	0	0	0	0	0	0	0	0	1
7	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	1	1	0	0	0	0	0	0	0	0	0	2
11	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	5	1	0	0	0	0	0	0	0	0	6
14	0	1	4	1	0	0	0	0	0	0	0	0	6
15	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	1	1	0	0	0	0	0	0	0	0	0	2
17	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	1	0	0	0	0	0	0	0	0	0	1
19	0	0	0	0	0	0	0	0	0	0	0	0	0
20	0	0	2	0	0	0	0	0	0	0	0	0	2
21	0	0	0	0	0	0	0	0	0	0	0	0	0
22	0	0	0	1	0	0	0	0	0	0	0	0	1
23	0	0	1	0	0	0	0	0	0	0	0	0	1
24	0	0	1	0	0	0	0	0	0	0	0	0	1
7-19	0	3	12	2	0	0	0	0	0	0	0	0	17
6-22	0	3	14	3	0	0	0	0	0	0	0	0	20
6-24	0	3	16	3	0	0	0	0	0	0	0	0	22
0-24	0	3	17	3	1	0	0	0	0	0	0	0	24

Direction : SOUTHBOUND

Saturday 08/07/2017	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	1	0	0	0	0	0	0	0	0	0	1
8	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	1	0	0	0	0	0	0	0	0	1
10	0	1	4	0	0	0	0	0	0	0	0	0	5
11	0	1	0	0	0	0	0	0	0	0	0	0	1
12	0	0	2	0	0	0	0	0	0	0	0	0	2
13	0	2	3	0	0	0	0	0	0	0	0	0	5
14	0	1	4	0	0	0	0	0	0	0	0	0	5
15	0	0	2	0	0	0	0	0	0	0	0	0	2
16	0	2	1	0	0	0	0	0	0	0	0	0	3
17	0	0	0	1	0	0	0	0	0	0	0	0	1
18	0	1	1	0	0	0	0	0	0	0	0	0	2
19	0	0	1	0	0	0	0	0	0	0	0	0	1
20	0	0	1	0	0	0	0	0	0	0	0	0	1
21	0	1	0	0	0	0	0	0	0	0	0	0	1
22	0	0	0	0	0	0	0	0	0	0	0	0	0
23	0	0	1	0	0	0	0	0	0	0	0	0	1
24	0	0	0	1	0	0	0	0	0	0	0	0	1
7-19	0	8	18	2	0	0	0	0	0	0	0	0	28
6-22	0	9	20	2	0	0	0	0	0	0	0	0	31
6-24	0	9	21	3	0	0	0	0	0	0	0	0	33
0-24	0	9	21	3	0	0	0	0	0	0	0	0	33

Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

Direction : NORTHBOUND

Sunday 09/07/2017	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	1	0	0	0	0	0	0	0	0	0	0	0	0	1
6	0	1	0	0	0	0	0	0	0	0	0	0	0	1
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	1	0	0	0	0	0	0	0	0	0	0	0	0	1
12	4	0	0	0	0	0	0	0	0	0	0	0	0	4
13	3	0	0	0	0	0	0	0	0	0	0	0	0	3
14	3	0	0	0	0	0	0	0	0	0	0	0	0	3
15	2	0	0	0	0	0	0	0	0	0	0	0	0	2
16	0	1	0	0	0	0	0	0	0	0	0	0	0	1
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	2	1	0	0	0	0	0	0	0	0	0	0	0	3
19	3	0	0	0	0	0	0	0	0	0	0	0	0	3
20	3	0	0	0	0	0	0	0	0	0	0	0	0	3
21	1	0	0	0	0	0	0	0	0	0	0	0	0	1
22	1	0	0	0	0	0	0	0	0	0	0	0	0	1
23	1	0	0	0	0	0	0	0	0	0	0	0	0	1
24	0	1	0	0	0	0	0	0	0	0	0	0	0	1
7-19	18	2	0	0	0	0	0	0	0	0	0	0	0	20
6-22	23	2	0	0	0	0	0	0	0	0	0	0	0	25
6-24	24	3	0	0	0	0	0	0	0	0	0	0	0	27
0-24	25	4	0	0	0	0	0	0	0	0	0	0	0	29

Direction : SOUTHBOUND

Sunday 09/07/2017	VEHICLE CLASSIFICATION													TOTAL
Hr Ending	1	2	3	4	5	6	7	8	9	10	11	12	13	
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	2	0	0	0	0	0	0	0	0	0	0	0	0	2
9	1	1	0	0	0	0	0	0	0	0	0	0	0	2
10	1	1	0	0	0	0	0	0	0	0	0	0	0	2
11	1	0	0	0	0	0	0	0	0	0	0	0	0	1
12	2	0	0	0	0	0	0	0	0	0	0	0	0	2
13	1	0	0	0	0	0	0	0	0	0	0	0	0	1
14	1	0	0	0	0	0	0	0	0	0	0	0	0	1
15	3	0	0	0	0	0	0	0	0	0	0	0	0	3
16	2	1	0	0	0	0	0	0	0	0	0	0	0	3
17	2	0	0	0	0	0	0	0	0	0	0	0	0	2
18	1	0	0	0	0	0	0	0	0	0	0	0	0	1
19	2	0	0	0	0	0	0	0	0	0	0	0	0	2
20	2	1	0	0	0	0	0	0	0	0	0	0	0	3
21	2	0	0	0	0	0	0	0	0	0	0	0	0	2
22	2	0	0	0	0	0	0	0	0	0	0	0	0	2
23	0	0	0	0	0	0	0	0	0	0	0	0	0	0
24	2	0	0	0	0	0	0	0	0	0	0	0	0	2
7-19	19	3	0	0	0	0	0	0	0	0	0	0	0	22
6-22	25	4	0	0	0	0	0	0	0	0	0	0	0	29
6-24	27	4	0	0	0	0	0	0	0	0	0	0	0	31
0-24	27	4	0	0	0	0	0	0	0	0	0	0	0	31

Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

Direction : NORTHBOUND

Sunday 09/07/2017	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	1	0	0	0	0	0	0	1
6	0	0	1	0	0	0	0	0	0	0	0	0	1
7	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	1	0	0	0	0	0	0	0	0	0	0	1
12	0	1	3	0	0	0	0	0	0	0	0	0	4
13	0	0	2	1	0	0	0	0	0	0	0	0	3
14	0	0	3	0	0	0	0	0	0	0	0	0	3
15	0	0	2	0	0	0	0	0	0	0	0	0	2
16	0	0	1	0	0	0	0	0	0	0	0	0	1
17	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	2	0	1	0	0	0	0	0	0	0	3
19	0	1	0	2	0	0	0	0	0	0	0	0	3
20	0	0	3	0	0	0	0	0	0	0	0	0	3
21	0	1	0	0	0	0	0	0	0	0	0	0	1
22	0	0	1	0	0	0	0	0	0	0	0	0	1
23	0	0	1	0	0	0	0	0	0	0	0	0	1
24	0	0	1	0	0	0	0	0	0	0	0	0	1
7-19	0	3	13	3	1	0	0	0	0	0	0	0	20
6-22	0	4	17	3	1	0	0	0	0	0	0	0	25
6-24	0	4	19	3	1	0	0	0	0	0	0	0	27
0-24	0	4	20	3	1	1	0	0	0	0	0	0	29

Direction : SOUTHBOUND

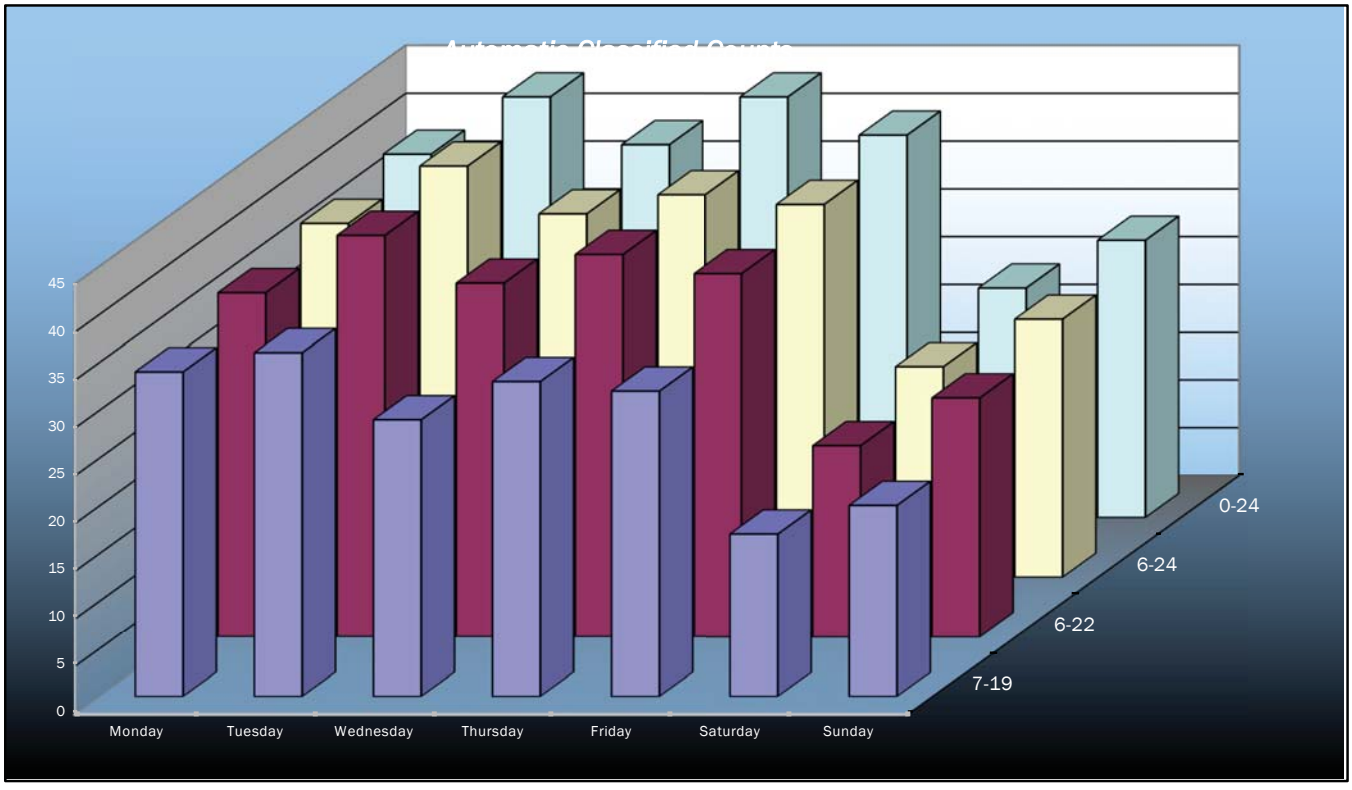
Sunday 09/07/2017	VEHICLE SPEED (MPH)												TOTAL
Hr Ending	0-10	11-20	21-30	31-35	36-40	41-45	46-50	51-55	56-60	61-70	71-80	81-120	
1	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	2	0	0	0	0	0	0	0	0	0	2
9	0	0	2	0	0	0	0	0	0	0	0	0	2
10	0	0	2	0	0	0	0	0	0	0	0	0	2
11	0	0	1	0	0	0	0	0	0	0	0	0	1
12	0	1	1	0	0	0	0	0	0	0	0	0	2
13	0	0	1	0	0	0	0	0	0	0	0	0	1
14	0	0	1	0	0	0	0	0	0	0	0	0	1
15	0	1	2	0	0	0	0	0	0	0	0	0	3
16	0	1	2	0	0	0	0	0	0	0	0	0	3
17	0	0	2	0	0	0	0	0	0	0	0	0	2
18	0	0	1	0	0	0	0	0	0	0	0	0	1
19	0	1	1	0	0	0	0	0	0	0	0	0	2
20	0	1	2	0	0	0	0	0	0	0	0	0	3
21	1	0	1	0	0	0	0	0	0	0	0	0	2
22	0	1	1	0	0	0	0	0	0	0	0	0	2
23	0	0	0	0	0	0	0	0	0	0	0	0	0
24	0	0	1	0	1	0	0	0	0	0	0	0	2
7-19	0	4	18	0	0	0	0	0	0	0	0	0	22
6-22	1	6	22	0	0	0	0	0	0	0	0	0	29
6-24	1	6	23	0	1	0	0	0	0	0	0	0	31
0-24	1	6	23	0	1	0	0	0	0	0	0	0	31

Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

Direction : NORTHBOUND

VEHICLE FLOWS									
Hr Ending	Monday 3-Jul-17	Tuesday 4-Jul-17	Wednesday 5-Jul-17	Thursday 6-Jul-17	Friday 7-Jul-17	Saturday 8-Jul-17	Sunday 9-Jul-17	WEEKDAY AVERAGE	WEEK AVERAGE
1	0	0	0	2	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	1	1	0	0
6	1	1	1	2	1	1	1	1	1
7	0	1	1	1	1	0	0	1	1
8	4	3	2	3	1	0	0	3	2
9	3	4	3	5	3	0	0	4	3
10	6	3	2	4	0	2	0	3	2
11	1	3	5	2	0	0	1	2	2
12	0	3	1	2	3	0	4	2	2
13	1	3	4	0	6	6	3	3	3
14	4	2	2	3	1	6	3	2	3
15	4	1	2	4	0	0	2	2	2
16	3	3	1	3	4	2	1	3	2
17	1	8	3	4	6	0	0	4	3
18	4	3	2	3	4	1	3	3	3
19	3	0	2	0	4	0	3	2	2
20	1	2	2	2	1	2	3	2	2
21	0	1	2	2	1	0	1	1	1
22	1	2	3	2	3	1	1	2	2
23	1	0	1	0	0	1	1	0	1
24	0	1	0	0	1	1	1	0	1
7-19	34	36	29	33	32	17	20	33	29
6-22	36	42	37	40	38	20	25	39	34
6-24	37	43	38	40	39	22	27	39	35
0-24	38	44	39	44	40	24	29	41	37

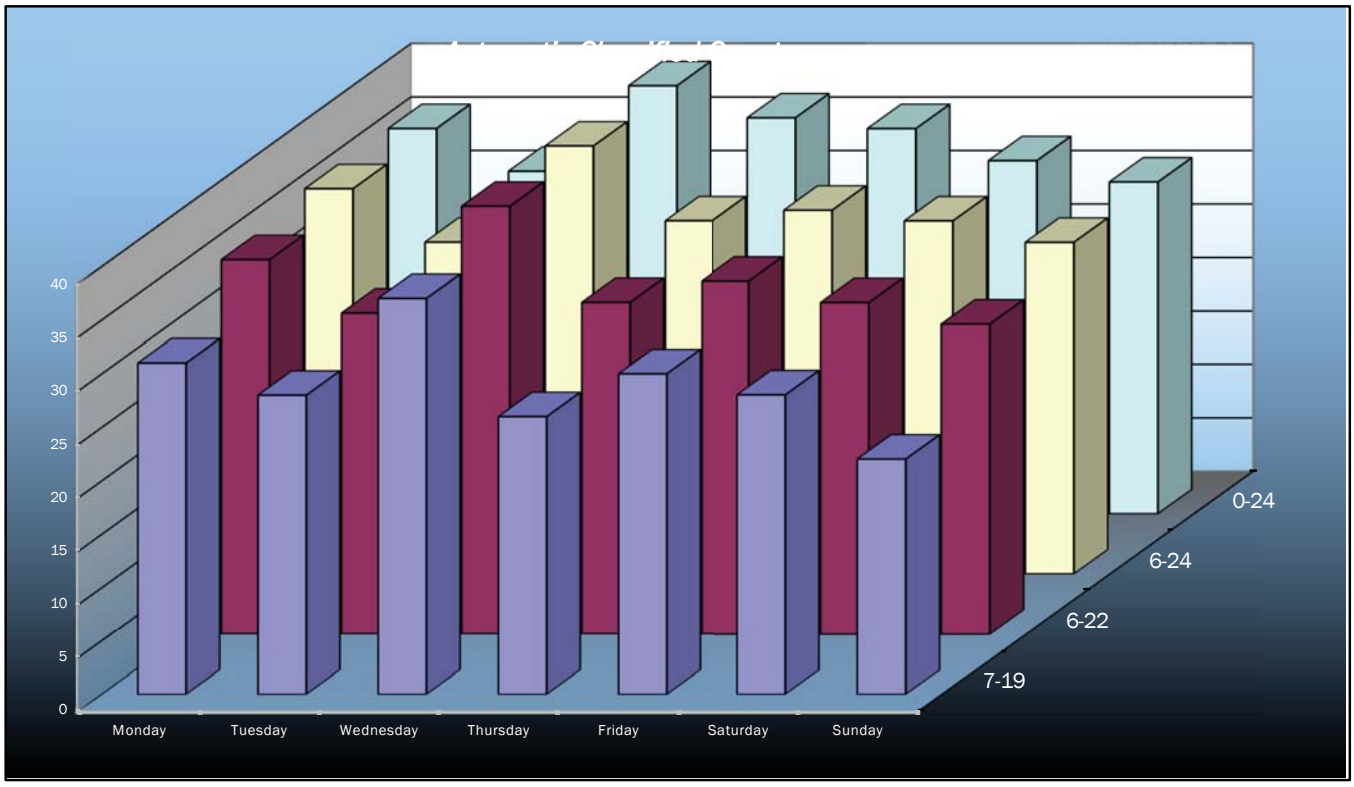


Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

Direction : SOUTHBOUND

SOUTHBOUND									
Hr Ending	Monday 3-Jul-17	Tuesday 4-Jul-17	Wednesday 5-Jul-17	Thursday 6-Jul-17	Friday 7-Jul-17	Saturday 8-Jul-17	Sunday 9-Jul-17	WEEKDAY AVERAGE	WEEK AVERAGE
1	0	0	0	3	0	0	0	1	0
2	0	0	0	0	1	0	0	0	0
3	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0
6	0	1	0	1	1	0	0	1	0
7	1	2	1	1	1	1	0	1	1
8	2	0	0	1	0	0	2	1	1
9	5	3	2	3	1	1	2	3	2
10	1	2	4	3	1	5	2	2	3
11	3	1	4	4	2	1	1	3	2
12	1	4	2	0	1	2	2	2	2
13	3	1	2	0	3	5	1	2	2
14	0	2	1	3	3	5	1	2	2
15	1	1	1	3	3	2	3	2	2
16	2	3	5	2	0	3	3	2	3
17	5	6	6	0	5	1	2	4	4
18	7	3	5	5	8	2	1	6	4
19	1	2	5	2	3	1	2	3	2
20	3	0	1	1	1	1	3	1	1
21	0	0	0	2	1	1	2	1	1
22	0	0	1	1	0	0	2	0	1
23	0	0	0	1	0	1	0	0	0
24	1	1	0	1	1	1	2	1	1
7-19	31	28	37	26	30	28	22	30	29
6-22	35	30	40	31	33	31	29	34	33
6-24	36	31	40	33	34	33	31	35	34
0-24	36	32	40	37	36	33	31	36	35



Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

Direction : NORTHBOUND

AVERAGE SPEEDS							
Hr Ending	Monday 3-Jul-17	Tuesday 4-Jul-17	Wednesday 5-Jul-17	Thursday 6-Jul-17	Friday 7-Jul-17	Saturday 8-Jul-17	Sunday 9-Jul-17
1	-	-	-	29.3	-	-	-
2	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-
5	-	-	-	-	-	38.0	43.0
6	25.5	25.5	25.5	29.3	25.5	25.5	25.5
7	-	33.0	33.0	33.0	33.0	-	-
8	20.5	18.8	20.5	22.2	15.5	-	-
9	22.2	29.3	28.0	23.5	28.0	-	-
10	17.2	18.8	25.5	20.5	-	20.5	-
11	5.5	22.2	21.5	20.5	-	-	15.5
12	-	25.5	15.5	20.5	22.2	-	23.0
13	25.5	25.5	25.5	-	25.1	26.8	28.0
14	25.5	25.5	25.5	28.0	33.0	25.1	25.5
15	18.0	25.5	20.5	23.0	-	-	25.5
16	28.0	25.5	25.5	15.5	23.0	20.5	25.5
17	25.5	23.9	18.8	24.9	23.8	-	-
18	23.0	27.2	25.5	25.5	25.5	25.5	29.7
19	28.0	-	24.3	-	20.5	-	27.2
20	33.0	29.3	20.5	25.5	25.5	25.5	25.5
21	-	33.0	15.5	25.5	33.0	-	15.5
22	33.0	25.5	28.0	25.5	29.7	33.0	25.5
23	25.5	-	25.5	-	-	25.5	25.5
24	-	25.5	-	-	33.0	25.5	25.5

10-12	5.5	23.8	18.5	20.5	22.2	-	19.3
14-16	23.0	25.5	23.0	19.3	23.0	20.5	25.5
0-24	23.7	25.8	23.6	24.5	26.4	26.5	25.7

85TH PERCENTILE							
Hr Ending	Monday 3-Jul-17	Tuesday 4-Jul-17	Wednesday 5-Jul-17	Thursday 6-Jul-17	Friday 7-Jul-17	Saturday 8-Jul-17	Sunday 9-Jul-17
1	-	-	-	34.6	-	-	-
2	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-
6	-	-	-	34.6	-	-	-
7	-	-	-	-	-	-	-
8	26.3	24.6	27.6	27.9	-	-	-
9	27.9	33.6	32.3	28.0	32.3	-	-
10	21.2	24.6	25.5	26.3	-	27.6	-
11	-	27.9	27.0	27.6	-	-	-
12	-	25.5	-	27.6	27.9	-	28.0
13	-	25.5	25.5	-	30.7	29.8	32.3
14	25.5	25.5	25.5	32.3	-	30.7	25.5
15	23.0	-	27.6	28.0	-	-	25.5
16	32.3	25.5	-	15.5	28.0	27.6	-
17	-	29.8	24.6	32.1	27.9	-	-
18	28.0	37.3	25.5	25.5	25.5	-	36.9
19	32.3	-	36.6	-	26.3	-	37.3
20	-	34.6	27.6	25.5	-	25.5	25.5
21	-	-	15.5	25.5	-	-	-
22	-	25.5	32.3	25.5	36.9	-	-
23	-	-	-	-	-	-	-
24	-	-	-	-	-	-	-

10-12	-	26.7	27.0	27.6	27.9	-	28.0
14-16	27.7	25.5	27.6	21.8	28.0	27.6	25.5
0-24	27.1	28.3	27.2	27.8	29.4	28.2	30.1

7 DAY AVERAGE SPEED	25.1
7 DAY AVERAGE 85th PERCENTILE	28.1

Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

Direction : SOUTHBOUND

AVERAGE SPEEDS							
Hr Ending	Monday 3-Jul-17	Tuesday 4-Jul-17	Wednesday 5-Jul-17	Thursday 6-Jul-17	Friday 7-Jul-17	Saturday 8-Jul-17	Sunday 9-Jul-17
1	-	-	-	28.0	-	-	-
2	-	-	-	-	33.0	-	-
3	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-
6	-	25.5	-	25.5	33.0	-	-
7	25.5	20.5	25.5	25.5	25.5	25.5	-
8	20.5	-	-	15.5	-	-	25.5
9	21.5	18.8	25.5	22.2	25.5	33.0	25.5
10	25.5	15.5	23.0	15.5	25.5	23.5	25.5
11	15.5	25.5	20.5	23.0	20.5	15.5	25.5
12	15.5	18.0	25.5	-	25.5	25.5	20.5
13	22.2	15.5	20.5	-	18.8	21.5	25.5
14	-	20.5	25.5	18.8	22.2	23.5	25.5
15	15.5	25.5	15.5	18.8	15.5	25.5	22.2
16	20.5	22.2	25.5	25.5	-	18.8	22.2
17	19.5	20.5	22.2	-	21.0	33.0	25.5
18	22.6	28.8	28.5	23.0	23.0	20.5	25.5
19	33.0	25.5	17.5	20.5	22.2	25.5	20.5
20	22.2	-	25.5	25.5	15.5	25.5	22.2
21	-	-	-	15.5	25.5	15.5	15.5
22	-	-	15.5	15.5	-	-	20.5
23	-	-	-	25.5	-	25.5	-
24	25.5	38.0	-	33.0	38.0	33.0	31.8
10-12	15.5	21.8	23.0	23.0	23.0	20.5	23.0
14-16	18.0	23.8	20.5	22.2	15.5	22.2	22.2
0-24	21.8	22.9	22.6	22.2	24.4	24.4	23.7

85TH PERCENTILE							
Hr Ending	Monday 3-Jul-17	Tuesday 4-Jul-17	Wednesday 5-Jul-17	Thursday 6-Jul-17	Friday 7-Jul-17	Saturday 8-Jul-17	Sunday 9-Jul-17
1	-	-	-	32.3	-	-	-
2	-	-	-	-	-	-	-
3	-	-	-	-	-	-	-
4	-	-	-	-	-	-	-
5	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-
7	-	27.6	-	-	-	-	-
8	27.6	-	-	-	-	-	25.5
9	27.0	24.6	25.5	27.9	-	-	25.5
10	-	15.5	28.0	15.5	-	28.0	25.5
11	15.5	-	26.3	28.0	27.6	-	-
12	-	23.0	25.5	-	-	25.5	27.6
13	27.9	-	27.6	-	24.6	27.0	-
14	-	27.6	-	24.6	27.9	28.0	-
15	-	-	-	24.6	15.5	25.5	27.9
16	27.6	27.9	25.5	25.5	-	24.6	27.9
17	25.0	26.0	27.3	-	29.0	-	25.5
18	27.5	40.6	38.1	30.5	27.6	27.6	-
19	-	25.5	25.9	27.6	27.9	-	27.6
20	27.9	-	-	-	-	-	27.9
21	-	-	-	15.5	-	-	29.6
22	-	-	-	-	-	-	27.6
23	-	-	-	-	-	-	-
24	-	-	-	-	-	-	40.6
10-12	15.5	23.0	25.9	28.0	27.6	25.5	27.6
14-16	27.6	27.9	25.5	25.1	15.5	25.1	27.9
0-24	25.7	26.5	27.7	25.2	25.7	26.6	28.2

7 DAY AVERAGE SPEED	23.2
7 DAY AVERAGE 85th PERCENTILE	26.6

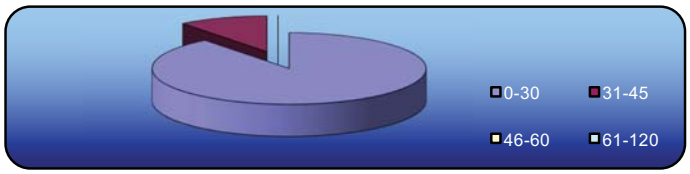
Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

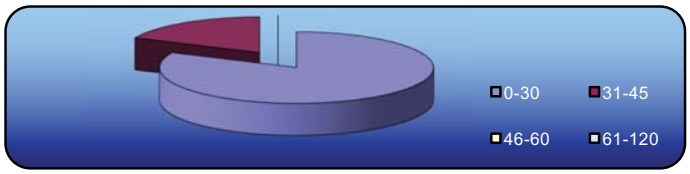
Direction : NORTHBOUND

SPEED SUMMARY							
SPEED (MPH)	Monday 3-Jul-17	Tuesday 4-Jul-17	Wednesday 5-Jul-17	Thursday 6-Jul-17	Friday 7-Jul-17	Saturday 8-Jul-17	Sunday 9-Jul-17
0-30	34	36	35	39	33	20	24
31-45	4	8	4	5	7	4	5
46-60	0	0	0	0	0	0	0
61-120	0	0	0	0	0	0	0
TOTAL	38	44	39	44	40	24	29

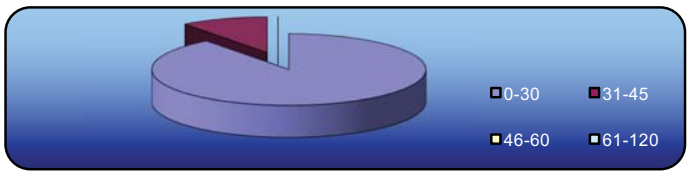
Monday
3-Jul-17



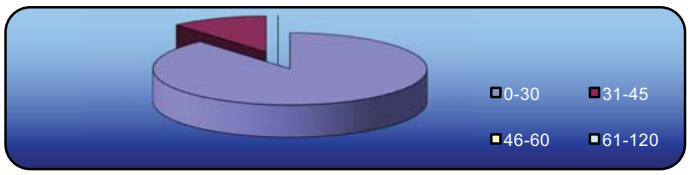
Tuesday
4-Jul-17



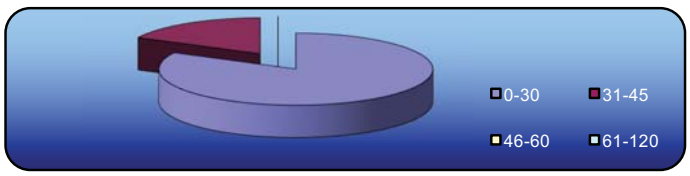
Wednesday
5-Jul-17



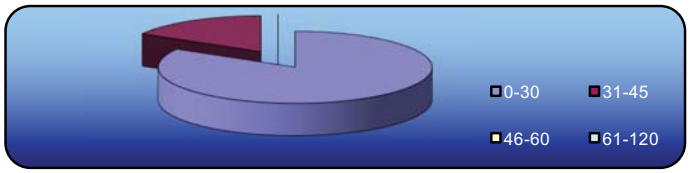
Thursday
6-Jul-17



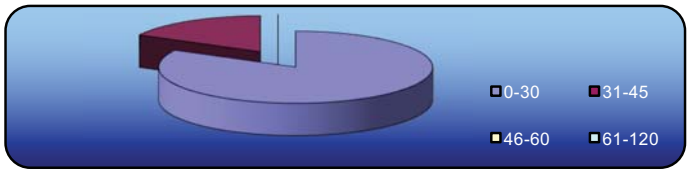
Friday
7-Jul-17



Saturday
8-Jul-17



Sunday
9-Jul-17



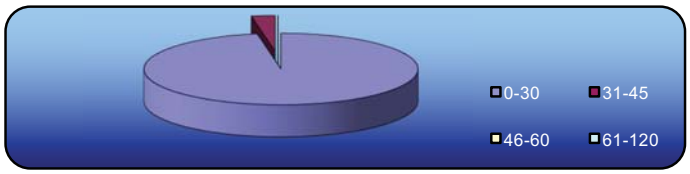
Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

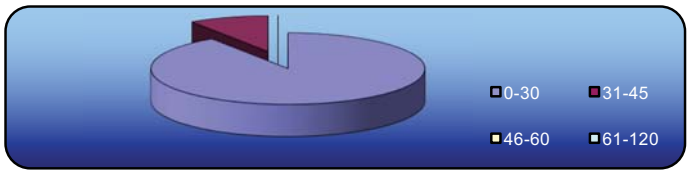
Direction : SOUTHBOUND

SPEED SUMMARY							
SPEED (MPH)	Monday 3-Jul-17	Tuesday 4-Jul-17	Wednesday 5-Jul-17	Thursday 6-Jul-17	Friday 7-Jul-17	Saturday 8-Jul-17	Sunday 9-Jul-17
0-30	35	29	38	34	32	30	30
31-45	1	3	2	3	4	3	1
46-60	0	0	0	0	0	0	0
61-120	0	0	0	0	0	0	0
TOTAL	36	32	40	37	36	33	31

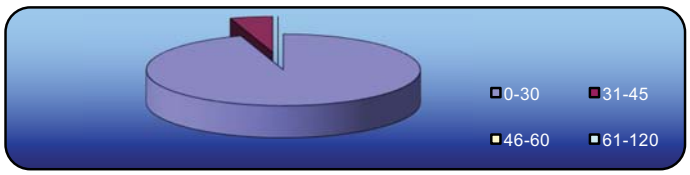
Monday
3-Jul-17



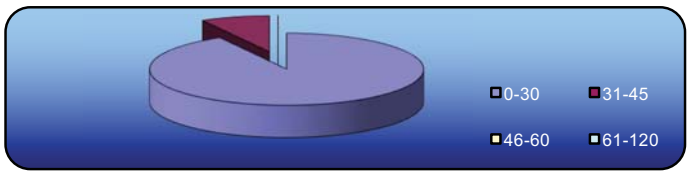
Tuesday
4-Jul-17



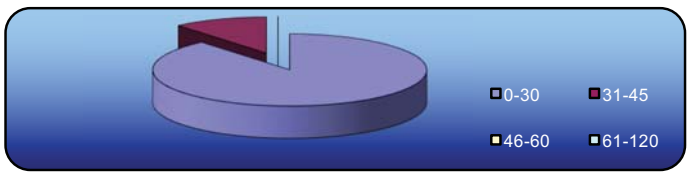
Wednesday
5-Jul-17



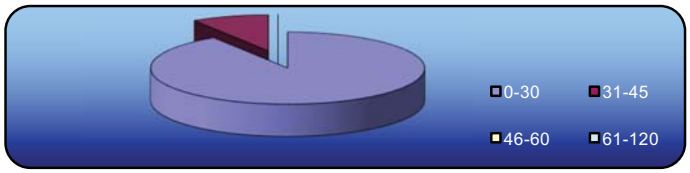
Thursday
6-Jul-17



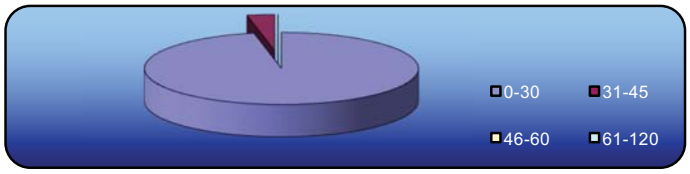
Friday
7-Jul-17



Saturday
8-Jul-17



Sunday
9-Jul-17

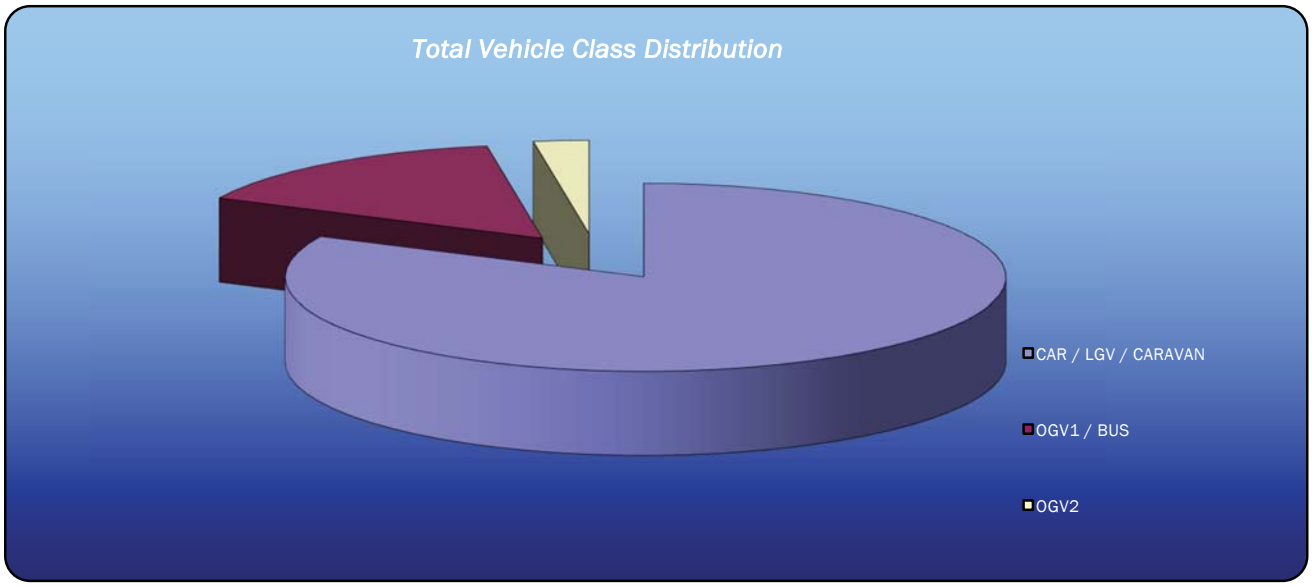


Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

Direction : NORTHBOUND

VEHICLE CLASSIFICATION				
	CAR / LGV / CARAVAN	OGV1 / BUS	OGV2	TOTAL
3-Jul-17				
7-19	28	6	0	34
6-22	30	6	0	36
6-24	31	6	0	37
0-24	31	7	0	38
4-Jul-17				
7-19	24	10	2	36
6-22	29	11	2	42
6-24	29	11	3	43
0-24	29	12	3	44
5-Jul-17				
7-19	26	2	1	29
6-22	34	2	1	37
6-24	35	2	1	38
0-24	36	2	1	39
6-Jul-17				
7-19	26	6	1	33
6-22	32	7	1	40
6-24	32	7	1	40
0-24	36	7	1	44
7-Jul-17				
7-19	27	4	1	32
6-22	32	5	1	38
6-24	32	6	1	39
0-24	33	6	1	40
8-Jul-17				
7-19	16	1	0	17
6-22	19	1	0	20
6-24	21	1	0	22
0-24	22	2	0	24
9-Jul-17				
7-19	18	2	0	20
6-22	23	2	0	25
6-24	24	3	0	27
0-24	25	4	0	29
AVERAGE				
7-19	24	4	1	29
6-22	28	5	1	34
6-24	29	5	1	35
0-24	30	6	1	37

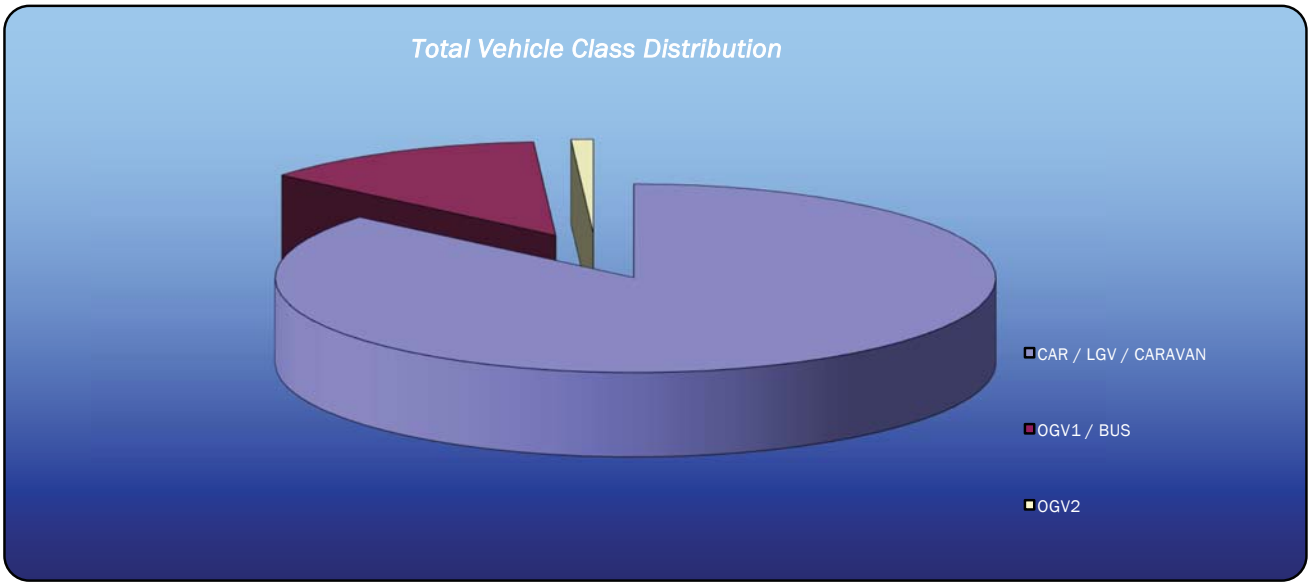


Automatic Classified Counts, Ruabon

LOCATION: CINDERS FARM

Direction : SOUTHBOUND

VEHICLE CLASSIFICATION				
	CAR / LGV / CARAVAN	OGV1 / BUS	OGV2	TOTAL
3-Jul-17				
7-19	26	5	0	31
6-22	29	6	0	35
6-24	30	6	0	36
0-24	30	6	0	36
4-Jul-17				
7-19	17	11	0	28
6-22	18	12	0	30
6-24	19	12	0	31
0-24	20	12	0	32
5-Jul-17				
7-19	35	1	1	37
6-22	38	1	1	40
6-24	38	1	1	40
0-24	38	1	1	40
6-Jul-17				
7-19	24	2	0	26
6-22	29	2	0	31
6-24	31	2	0	33
0-24	35	2	0	37
7-Jul-17				
7-19	27	2	1	30
6-22	30	2	1	33
6-24	31	2	1	34
0-24	33	2	1	36
8-Jul-17				
7-19	26	2	0	28
6-22	29	2	0	31
6-24	31	2	0	33
0-24	31	2	0	33
9-Jul-17				
7-19	19	3	0	22
6-22	25	4	0	29
6-24	27	4	0	31
0-24	27	4	0	31
AVERAGE				
7-19	25	4	0	29
6-22	28	4	0	33
6-24	30	4	0	34
0-24	31	4	0	35



Appendix 4.2

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Crash Date:	Thursday, July 30, 2015	**Time of Crash:**	2:15:00 PM	**Crash Reference:**	**201560S113899**

Highest Injury Severity:	Slight	**Road Number:**	A539	**Number of Casualties:**	3
Highway Authority:	Wrexham			**Number of Vehicles:**	2
Local Authority:	Wrexham			**OS Grid Reference:**	332737 343212
Weather Description:	Fine without high winds				
Road Surface Description:	Dry				
Speed Limit:	60				
Light Conditions:	Daylight: regardless of presence of streetlights				
Carriageway Hazards:	None				
Junction Detail:	Crossroads				
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres				
Road Type:	Single carriageway				
Junction Control:	Give way or uncontrolled				



For more information about the data please visit: *www.crashmap.co.uk/home/aboutthedata* and *www.crashmap.co.uk/home/definitions*

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Vehicles involved

Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Car (excluding private hire)	-1	Female	26 - 35	Vehicle proceeding normally along the carriageway, not on a bend	Front	Other	None	None
2	Car (excluding private hire)	-1	Male	26 - 35	Vehicle proceeding normally along the carriageway, not on a bend	Front	Other	None	None

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
1	1	Slight	Driver or rider	Female	26 - 35	Unknown or other	Unknown or other
1	3	Slight	Vehicle or pillion passenger	Male	6 - 10	Unknown or other	Unknown or other
2	2	Slight	Driver or rider	Male	26 - 35	Unknown or other	Unknown or other

Accident Description: Accident description text currently unavailable for this highway authority / police force

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Crash Date:	Monday, October 06, 2014	**Time of Crash:**	1:01:00 PM	**Crash Reference:**	**201460R157993**

Highest Injury Severity:	Slight	**Road Number:**	A539	**Number of Casualties:**	1
Highway Authority:	Wrexham			**Number of Vehicles:**	1
Local Authority:	Wrexham			**OS Grid Reference:**	332360 343265
Weather Description:	Fine without high winds				
Road Surface Description:	Wet or Damp				
Speed Limit:	60				
Light Conditions:	Daylight: regardless of presence of streetlights				
Carriageway Hazards:	None				
Junction Detail:	Not at or within 20 metres of junction				
Junction Pedestrian Crossing:	No physical crossing facility within 50 metres				
Road Type:	Single carriageway				
Junction Control:	Not Applicable				



For more information about the data please visit: *www.crashmap.co.uk/home/aboutthedata* and *www.crashmap.co.uk/home/definitions*

powered by INSIGHTwarehouse

Vehicles involved

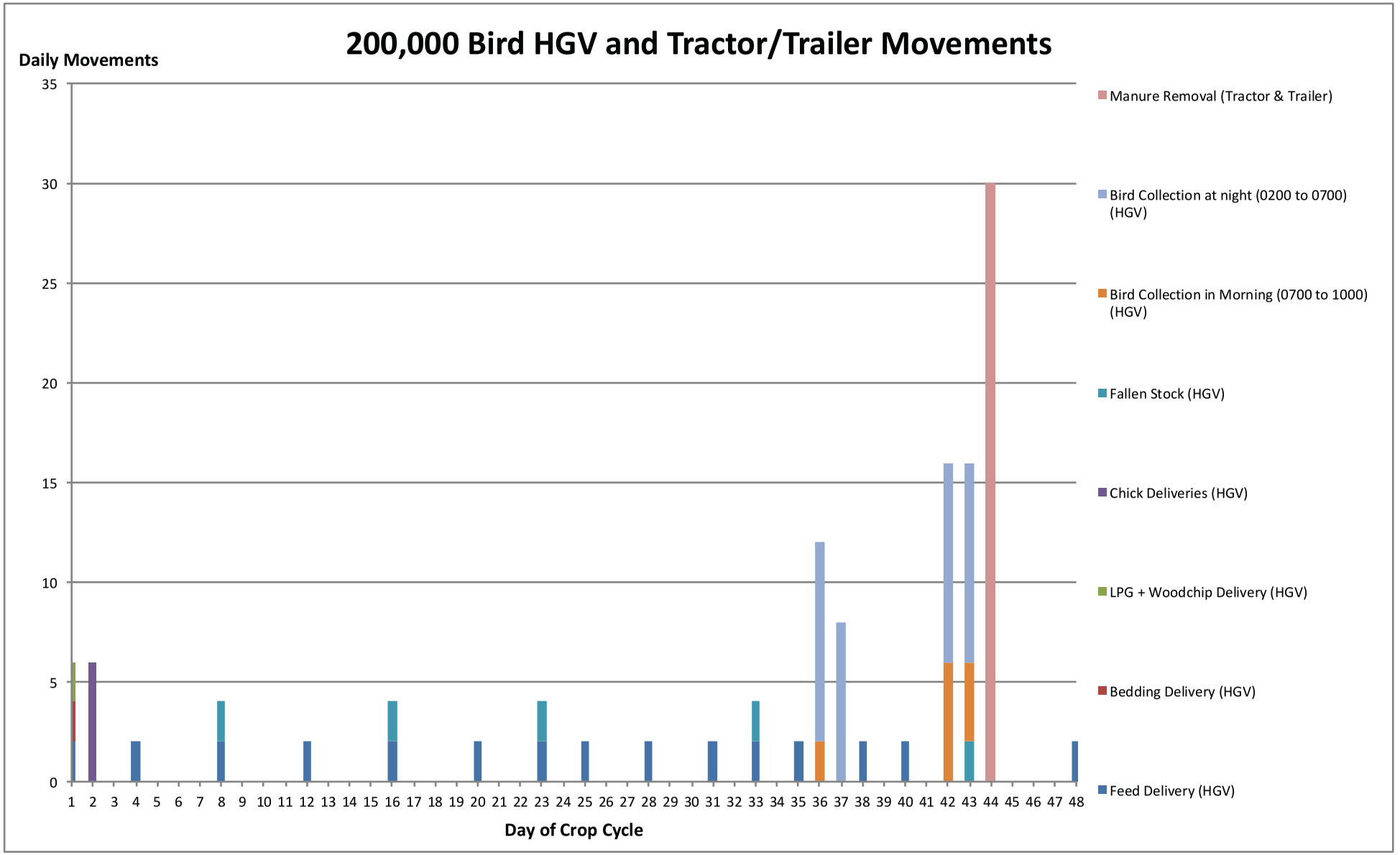
Vehicle Ref	Vehicle Type	Vehicle Age	Driver Gender	Driver Age Band	Vehicle Maneouvre	First Point of Impact	Journey Purpose	Hit Object - On Carriageway	Hit Object - Off Carriageway
1	Car (excluding private hire)	-1	Male	26 - 35	Vehicle proceeding normally along the carriageway, on a right hand bend	Front	Other	None	Other permanent object

Casualties

Vehicle Ref	Casualty Ref	Injury Severity	Casualty Class	Gender	Age Band	Pedestrian Location	Pedestrian Movement
1	1	Slight	Driver or rider	Male	26 - 35	Unknown or other	Unknown or other

Accident Description: Accident description text currently unavailable for this highway authority / police force

Appendix 4.3

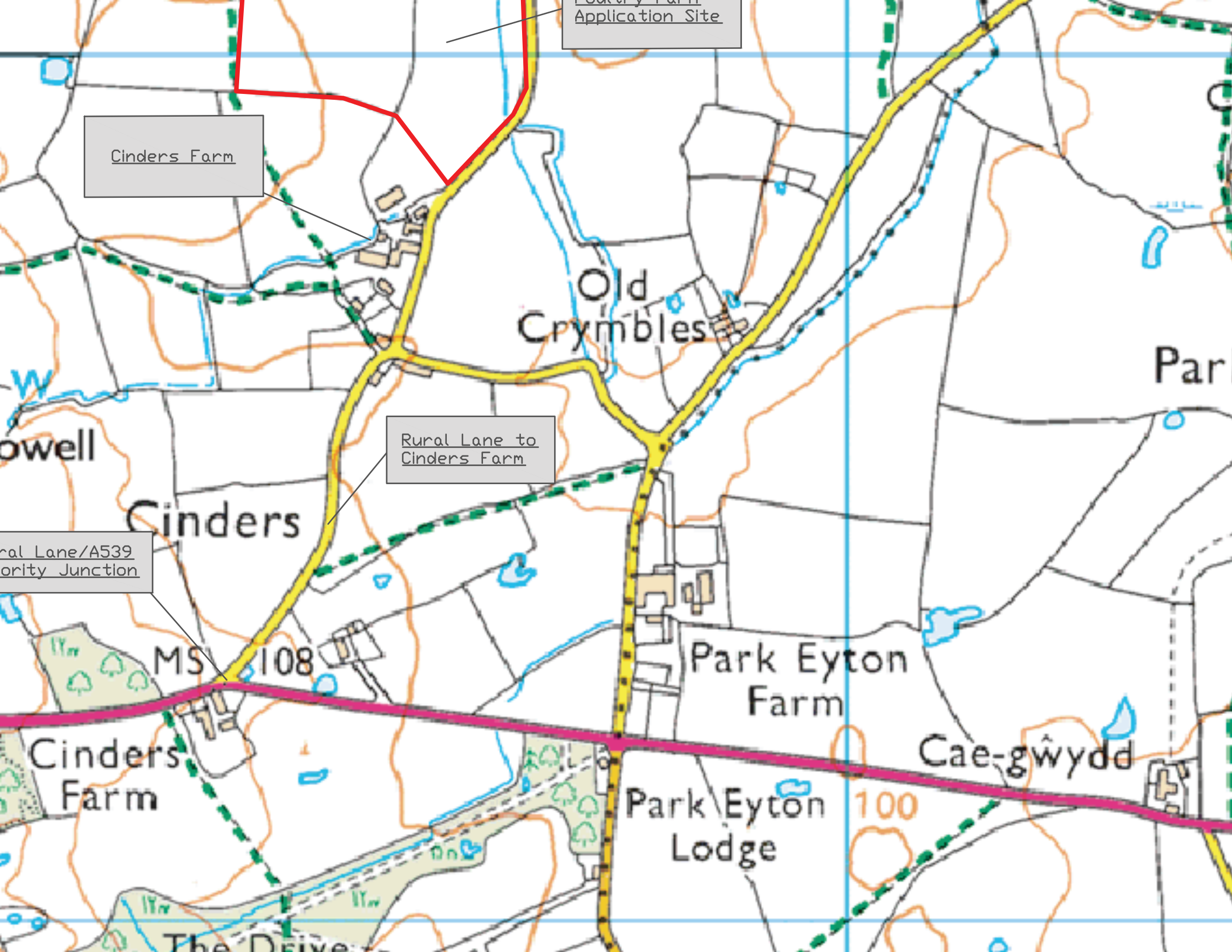

200,000 Bird HGV and Tractor/Trailer Movements
Daily Movements
35
30
25
20
15
10
5
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48
Day of Crop Cycle
Manure Removal (Tractor & Trailer)
Bird Collection at night (0200 to 0700) (HGV)
Bird Collection in Morning (0700 to 1000) (HGV)
Fallen Stock (HGV)
Chick Deliveries (HGV)
LPG + Woodchip Delivery (HGV)
Bedding Delivery (HGV)
Feed Delivery (HGV)

	HGV							Tractor & Trailer		Summary of Movements (Total)		
Day of cycle (approx)	Feed Delivery (HGV)	Bedding Delivery (HGV)	LPG + Woodchip Delivery (HGV)	Chick Deliveries (HGV)	Fallen Stock (HGV)	Bird Collection in Morning (0700 to 1000) (HGV)	Bird Collection at night (0200 to 0700) (HGV)	Manure Removal (Tractor & Trailer)	Daily Movements	Daytime (0700 to 1800)	Nightime (0200 to 0700)	Total
Delivery Time	Daytime	Daytime	Daytime	Daytime	Daytime	Daytime	Nightime	Daytime				
1	2	2	2						6	6	0	6
2				6					6	6	0	6
3									0	0	0	0
4	2								2	2	0	2
5									0	0	0	0
6									0	0	0	0
7									0	0	0	0
8	2				2				4	4	0	4
9									0	0	0	0
10									0	0	0	0
11									0	0	0	0
12	2								2	2	0	2
13									0	0	0	0
14									0	0	0	0
15									0	0	0	0
16	2				2				4	4	0	4
17									0	0	0	0
18									0	0	0	0
19									0	0	0	0
20	2								2	2	0	2
21									0	0	0	0
22									0	0	0	0
23	2				2				4	4	0	4
24									0	0	0	0
25	2								2	2	0	2
26									0	0	0	0
27									0	0	0	0
28	2								2	2	0	2
29									0	0	0	0
30									0	0	0	0
31	2								2	2	0	2
32									0	0	0	0
33	2				2				4	4	0	4
34									0	0	0	0
35	2								2	2	0	2
36						2	10		12	2	10	12
37							8		8	0	8	8
38	2								2	2	0	2
39									0	0	0	0
40	2								2	2	0	2
41									0	0	0	0
42						6	10		16	6	10	16
43					2	4	10		16	6	10	16
44								30	30	30	0	30
45									0	0	0	0
46									0	0	0	0
47									0	0	0	0
48	2								2	2	0	2
Cinders Poultry Farm Movements	30	2	2	6	10	12	38	30	130	92	38	130

Note that a Movement is from an Origin to Destination - to calculate the two-way trips or the vehicle numbers the figures should be halved

Assumes that bird collection is restricted to two movements per hour between 0200 and 0700 hours

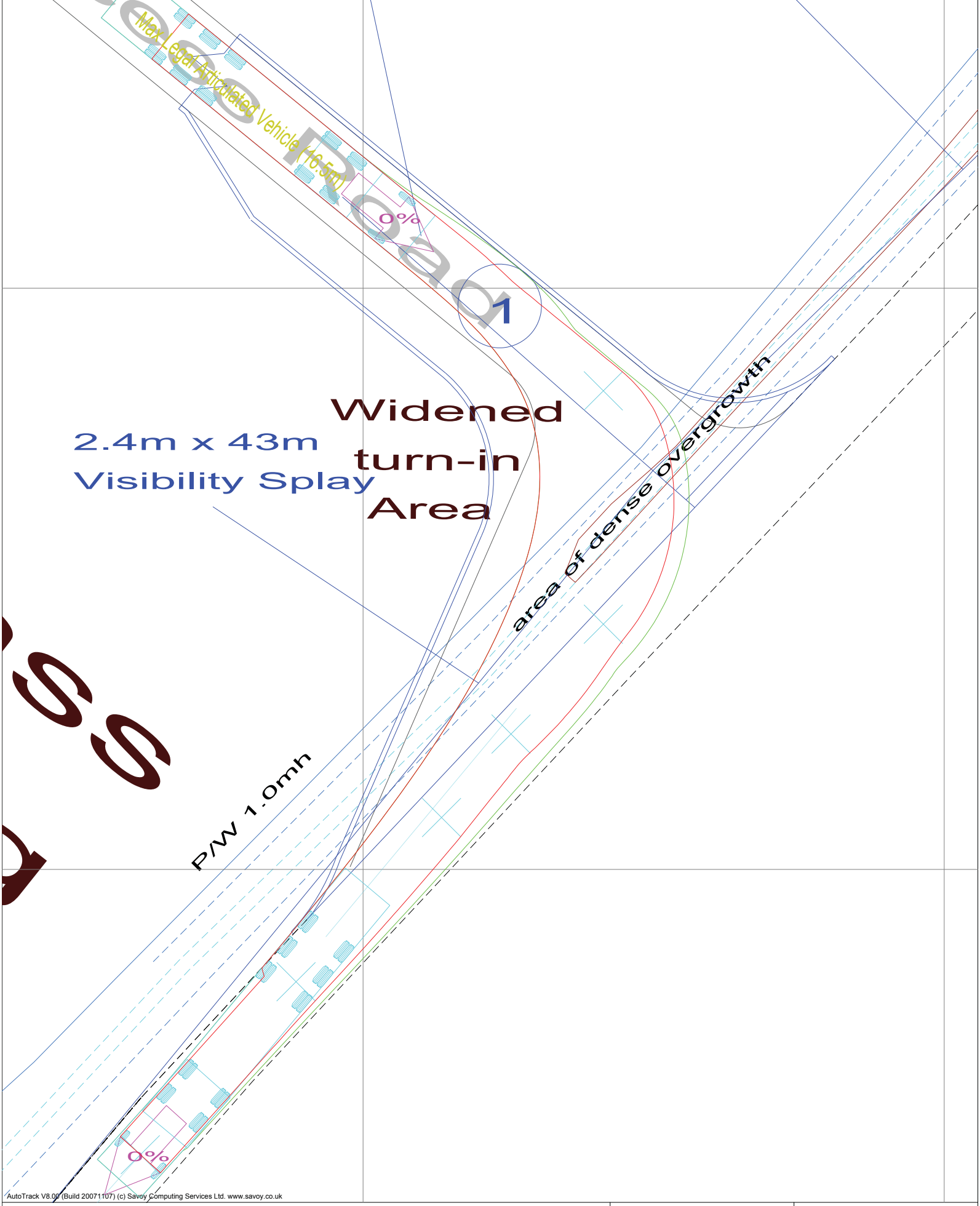
Appendix 4.4


Poultry Farm Application Site
Cinders Farm
Old Crymbles
Rural Lane to Cinders Farm
owell
Cinders
ral Lane/A539 ority Junction
MS 108
Park Eyton Farm
Cae-gŵydd
Cinders Farm
Park Eyton Lodge
100
The Drive

Appendix 4.5


The Old School
House Farm
A539
A539
A539

Appendix 4.6



Title: Cinders Farm Proposed Site Access 16.5m Max Artic Vehicle	Scale: 1:200
	Date: 09/01/2018
	Prepared: KAT
Client:	Checked: MAK

Appendix 5.1

Appendix 5.1 – Noise and Vibration Policy and Guidance

National Legislation and Policy

Control of Pollution Act 1974, Part III

Sections 60 and 61 of the Control of Pollution Act 1974 provide the local authority special powers for controlling noise arising from construction and demolition works, regardless of whether a statutory nuisance has been caused or is likely to be caused. These powers may be exercised either before works start or after they have started.

Section 72 of the Act defines “best practicable means” (BPM) to be adopted during construction activities. “Practicable” means reasonably practicable having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to the financial implications. The means to be employed include the design, installation, maintenance and manner and periods of operation of plant and machinery, and the design, construction and maintenance of buildings and acoustic structures.

Environmental Protection Act 1990, Part III

Section 79 of the Environmental Protection Act 1990 (as amended) declares a number of matters to be statutory nuisances, one of which is noise, the term being defined to include vibration. Under the provisions of the Act, the local authority is required to inspect its area periodically to detect any nuisance and, where a complaint of a statutory nuisance is made by a person living within its area, to take such steps as are reasonably practicable to investigate the complaint. Should it be satisfied of the existence of a statutory nuisance, the local authority is obliged to serve an abatement notice.

Planning Policy

Environmental Noise (Wales) Regulations 2006

These Regulations implement Directive 2002/49/EC relating to the assessment of and management of environmental noise.

Section 13.13.1:

“*Noise can affect people’s health and well-being and have a direct impact on wildlife and local amenity. Noise levels provide an indicator of local environmental quality. The objective of a policy for noise is to minimise emissions and reduce ambient noise levels to an acceptable standard. Noise Action Plans, drawn up by the Welsh Ministers in relation to Wales under the Environmental Noise Directive, and the Wales Regulations, aim to prevent and reduce environmental noise where necessary and preserve environmental noise quality where it is good. They are a planning consideration in the use and development of land.*”

Section 13.14.1:

“*Development plan policies should be designed to ensure, as far as is practicable, that noise-sensitive developments, such as hospitals, schools and housing, which need to be located close to the existing transportation infrastructure to facilitate access, are designed in such a way as to limit noise levels within and around those developments. Such development should be located away from existing sources of significant noise including air transport and some industrial activities or programmed development such as improved or new roads. Policies should also be designed to ensure, as far as possible, that potentially noisy developments are located in areas where noise will not be such an important consideration or where its impact can be minimised. Local planning authorities should adopt policies to prevent potentially noisy developments in areas which have remained relatively undisturbed by noise. Development plan policies should have regard to any*

relevant Noise Action Plan, including the need to protect urban 'quiet areas' against an increase in noise."

Section 13.15.1:

"*Noise can be a material planning consideration, for example in proposals to use or develop land near an existing source of noise or where a proposed new development is likely to generate noise. Local planning authorities should make a careful assessment of likely noise levels and have regard to any relevant Noise Action Plan before determining such planning applications and in some circumstances it will be necessary for a technical noise assessment to be provided by the developer.*"

The Welsh Government Planning Policy Wales (Edition 9) (2016)

Planning Policy Wales (PPW) sets out the land use planning policies of the Welsh Government.

The PPW sets out a number of sustainability objectives for the planning system and that should be taken into account in the preparation of development plans and in taking decisions on individual planning applications in Wales.

Particular reference to noise is provided in Section 13 of the PPW and the most relevant parts are as follows;

> "*Noise can be a material planning consideration, for example in proposals to use or develop land near an existing source of noise or where a proposed new development is likely to generate noise. Local planning authorities should make a careful assessment of likely noise levels and have regard to any relevant Noise Action Plan before determining such planning applications and in some circumstances it will be necessary for a technical noise assessment to be provided by the developer.*
>
> *Special consideration is required where noise-generating development is likely to affect a protected species, or is proposed in or near statutorily designated areas, including urban 'quiet areas' designated in Noise Action Plans. The effect of noise on the enjoyment of other areas of landscape, wildlife and historic value should also be taken into account*"

The PPW is supplemented by a series of Technical Advice Notes (TANs). Of particular relevance to noise and vibration is TAN 11 Noise (1997).

The Wrexham County Borough Council Unitary Development Plan (UDP)

The current development plan for Wrexham County Borough Council is the Unitary Development Plan (UDP) 1996-2011, which was adopted on 14 February 2005. The council are in the process of preparing the Wrexham Local Development Plan 2 2013 – 2028, however this is currently subject to delay.

Guidance

Planning Guidance (Wales) Technical Advice Note (Wales) 11, Noise (1997)

Technical Advice Note (Wales) (TAN) 11 provides specific information in both the assessment and measurement of major sources of noise including industrial noise. This document is intended to be read in conjunction with 'Planning Guidance (Wales): Planning Policy'. Technical Advice Notes and circulars are taken into account by local planning authorities in Wales in the preparation of development plans. They may be material to decisions on individual planning applications and will be taken into account by the Secretary of State and his Inspectors in the determination of called-in planning applications and appeals.

TAN11 states the following in relation to noise generating development;

> "*Local planning authorities must ensure that noise generating development does not cause an unacceptable degree of disturbance. They should also bear in mind that if subsequent*

intensification or change of use results in greater intrusion, consideration should be given to the use of appropriate conditions.

Noise characteristics and levels can vary substantially according to their source and the type of activity involved. In the case of industrial development, for example, the character of the noise should be taken into account as well as its level. Sudden impulses, irregular noise or noise which contains a distinguishable continuous tone will require special consideration."

When considering noise mitigation measures the following applies;

"i. engineering: reduction of noise at point of generation (e.g. using quiet machines and/or quiet methods of working); containment of noise generated (e.g. insulating buildings which house machinery and/or providing purpose-built barriers around sites); protection of surrounding noise-sensitive buildings (e.g. improving sound insulation in these buildings and/or screening them by purpose-built barriers);

ii. lay-out: adequate distance between noise source and noise-sensitive building or area; screening by natural barriers, other buildings, or non-critical rooms in a building;

iii. administrative: limiting operating time of noise source; restricting activities allowed on the site; specifying an acceptable noise limit.

For the assessment of industrial and commercial developments TAN11 recommends the use of the assessment methodology presented in BS4142 and that the general guidance on acceptable noise levels within buildings can be found in BS8233.

BS 5228-1:2009+A1:2014 Noise and Vibration Control on Construction and Open Sites. Part 1: Noise (BS 5228-1)

This Standard sets out techniques to predict and assess the likely noise effects from construction works, based on detailed information on the type and number of plant being used, their location, and the length of time they are in operation.

The noise prediction method is used to establish likely noise levels in terms of the $L_{Aeq,T}$ over the core working day. This Standard also documents a database of information, comprising previously measured sound power levels for a variety of different construction plant undertaking various common activities.

Example criteria are presented for the assessment of the significance of noise effects. Such criteria are concerned with fixed noise limits and ambient noise level changes. With respect to fixed noise limits BS 5228 discusses those included within Advisory Leaflet 72: 1976: Noise Control on Building Sites. These limits are presented according to the nature of the surrounding environment, for a 12-hour working day. The presented limits are:

- 70 dB(A) in rural, suburban and urban areas away from main road traffic and industrial noise; and
- 75 dB(A) in urban areas near main roads and heavy industrial areas.

The Standard goes on to provide methods for determining the significance of construction noise levels considering the change in the ambient noise level brought about by the construction work. Two example assessment methods are presented, these are the ABC method presented within the following table and the 5 dB(A) change method as described within the following paragraph.

Table A5.1.1 Example Threshold of Significant Effect at Dwellings – ABC Method

Assessment Category and threshold value	**Threshold value, in decibels (dB) ($L_{Aeq,T}$)**

period			
	Category A[A])	**Category B[B])**	**Category C[C])**
Night-time (23:00 – 07:00)	45	50	55
Evenings and weekends[D])	55	60	65
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
NOTE 1: A significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the Category appropriate to the ambient noise level. NOTE 2: If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total L_{Aeq} noise level for the period increases by more than 3 dB due to the site noise. NOTE 3: Applied to residential receptors only			
A) Category A: threshold values to use when ambient levels (when rounded to the nearest 5 dB) are less than these values. B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as Category A values. C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than Category A values. D) 19.00-23.00 weekdays, 13.00-23.00 Saturdays and 07.00-23.00 Sundays			

With respect to the 5 dB(A) change method, the guidance states:

> *'Noise levels generated by site activities are deemed to be potentially significant if the total noise (pre-construction ambient plus site noise) exceeds the pre-construction ambient noise by 5 dB $L_{Aeq,T}$ or more, subject to lower cut-off values of 65 dB, 55 dB and 45 dB $L_{Aeq,T}$ from site noise alone, for the daytime, evening and night-time periods, respectively; and a duration of one month or more, unless works of a shorter duration are likely to result in significant effect'.*

BS 5228-2: 2009+A1:2014 Noise and Vibration Control on Construction and Open Sites. Part 2: Vibration (BS 5228-2)

This Standard provides recommendations for basic methods of vibration control relating to construction and open sites. The legislative background to vibration control is described and guidance is provided concerning methods of measuring vibration and assessing its effects on the environment.

Guidance criteria are suggested for the assessment of the significance of vibration effects; such criteria are provided in terms of Peak Particle Velocities (PPV) and are concerned with both human and structural responses to vibration. Those applicable to human perception and disturbance are presented within the table below.

Table A5.1.2 Guidance on Effects of Vibration Levels

Vibration Level (PPV)	Effect
0.14 mms^{-1}	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3 mms^{-1}	Vibration might be just perceptible in residential environments.
1.0 mms^{-1}	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.
10 mms^{-1}	Vibration is likely to be intolerable for any more than a very brief exposure to this level.

The Standard goes on to present guidance criteria applicable to the vibration response limits of buildings in terms of the component PPV, these are presented within the table below.

Table A5.1.3 Transient Vibration Guide Values for Cosmetic Damage

Type of building	Peak component particle velocity in frequency range of predominant pulse	
	4 Hz to 15 Hz	**15 Hz and above**
Reinforced or framed structures Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	50 mm/s at 4 Hz and above
Unreinforced or light framed structures Residential or light commercial buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above
NOTE 1: Values referred to are at the base of the building. NOTE 2: At frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.		

It should be noted that the values presented within the above table are applicable to cosmetic damage only. It is stated within BS 5228-2 that minor damage is possible at vibration magnitudes which are greater than twice those given in the table.

BS 4142:2014: Methods For Rating and Assessing Industrial and Commercial Sound

BS 4142 describes methods for rating and assessing sound of an industrial and/or commercial nature. Such sound sources include industrial/manufacturing processes, sound from fixed installations comprising mechanical and electrical plant and equipment, sound from the loading and unloading of goods and materials, and sound from mobile plant and vehicles which are intrinsic to the overall sound emanating from premises or processes.

The Standard describes methods using outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling upon which sound is incident.

The procedure contained in BS 4142 is to compare the measured or predicted noise level from the source in question, the 'specific noise' level, at the assessment location with the 'background noise' level. Where the noise contains acoustic features (tonality, impulsivity, intermittency etc.) a character correction is to be added to the 'specific noise' level to obtain the 'rating noise level'. Corrections for acoustic features can be determined subjectively or objectively, with a range of correction factors applied depending on the assessed character of the specific noise.

For the daytime, the specific sound is to be evaluated over a 1 hour period, and over a 15 minute period at night. Day and night are defined in the Standard as 07:00 to 23:00 hours and 23:00 to 07:00 hours respectively.

BS 4142 advises that the measurement time interval should be *'sufficient to obtain a representative value of the background sound level for the period of interest. This should comprise continuous measurements of normally not less than 15 min intervals, which can be contiguous or disaggregated.'*

The BS 4142 assessment requires that an estimate of the impact of the specific sound is undertaken by subtracting the measured background sound level from the rating level. The Standard states that the calculated difference is to be considered against the following:

a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

d) 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. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

The Standard goes on to state:

Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following.

1) The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.

Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night. Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.

2) The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound, to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/or commercial nature is likely to be perceived and how people react to it.

3) The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as:

i) facade insulation treatment;

ii) ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and

iii) acoustic screening.

The Design Manual for Roads and Bridges (DMRB): VOLUME 11: Environmental Assessment

Section 3 Part 7 of this document is that which is pertinent to noise and vibration and was published by the Department of Transport in 1993 with later amendments, the latest of which is November 2011. This document sets out procedures for undertaking the environmental assessment of new road schemes, including the assessment of noise impacts from road traffic. In particular, Section 3 Part 7 describes a method for assessing the severity of a noise impact, in terms of the number of people who will be bothered from any noise increase due to a new road scheme. In undertaking a DMRB assessment, the calculation of traffic noise levels uses the methodology contained within the Calculation of Road Traffic Noise (CRTN) document as described below.

Although the DMRB strictly applies to new road schemes, the principles of the approach contained within the document can also be applied to the assessment of noise from road traffic in general. The Proposed Development has the potential to affect road traffic noise levels along existing roads, hence the need for this assessment.

The DMRB assessment suggests that the magnitude of noise changes from a project should be classified into levels of impact. The November 2011 amendment to Section 3 Part 7 gives detailed consideration to how effect magnitude will be affected by whether a noise level change will occur in the short term (e.g. as a result of a sudden opening of a scheme), or whether the noise level change would occur in the long term (e.g. gradually over time, such as that associated with natural traffic growth).

The two example classification scales contained within the DMRB are duplicated in Table A5.1.4 (short term) and Table A5.1.5 (long term).

Table A5.1.4 Classification of Magnitude of Noise Changes in the Short Term

Noise Change, $L_{A10,18h}$, dB	**Magnitude of Change**
0	No Change
0.1 to 0.9	Negligible
1.0 to 2.9	Minor
3.0 to 4.9	Moderate
5.0+	Major

Table A5.1.5 Classification of Magnitude of Noise Changes in the Long Term

Noise Change, $L_{A10,18h}$, dB	**Magnitude of Change**
0	No Change
0.1 to 2.9	Negligible
3.0 to 4.9	Minor / Low
5.0 to 9.9	Moderate / Medium
10.0+	Major / High

The DMRB confirms that the above scales apply to the magnitude of change, (not the significance of effect). The significance of effect will depend upon both the magnitude of change and the sensitivity of the receiving environment.

Calculation of Road Traffic Noise (CRTN) 1988

Published by the Department of Transport and the Welsh Office in 1988, this document sets out standard procedures for calculating noise levels from road traffic. The calculation methods use a number of input variables, including traffic flow volume, average vehicle speed, percentage of heavy goods vehicles, type of road surface, site geometry and the presence of noise barriers or acoustically absorbent ground. CRTN predicts the $L_{A10,18h}$ or $L_{A10,1h}$ noise level for any receptor point at a given distance, up to 300m, from the road.

BS 8233:2014: Guidance on Sound Insulation and Noise Reduction for Buildings

BS 8233:2014 provides recommendations for the control of noise in and around buildings. It suggests appropriate criteria and limits for different situations, which are primarily intended to guide the design of new buildings, or refurbished buildings undergoing a change of use, rather than to assess the effect of changes in the external noise climate.

The Standard suggests suitable internal noise levels within different types of buildings, including residential dwellings. It suggests that for steady external noise sources, during the day, an internal noise level of 35 dB $L_{Aeq,T}$ is appropriate for resting conditions within living rooms and bedrooms and a

level of 40 dB $L_{Aeq,T}$ is applicable to dining rooms. During the night, an internal noise level of 30 dB $L_{Aeq,T}$ is recommended within bedrooms.

The recommended levels are based on the existing guidelines issued by the WHO and assume normal diurnal fluctuations in external noise. It is also stated that '*Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved*.'

For regular individual noise events with the potential to cause sleep disturbance it is stated that a guideline value may be set in terms of SEL or $L_{Amax,F}$. No further guidance is provided with respect to an appropriate criterion which may be adopted for the assessment of such events.

Recommendations for design criteria for external noise are also provided, in this regard it is stated;

> *'For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited'.*

World Health Organisation (WHO): 1999: Guidelines for Community Noise

This is a wide ranging document describing the effects of community noise. It provides information about the effects of noise that may occur at certain levels of exposure. For dwellings, the critical effects of noise are taken to be sleep disturbance, annoyance and speech interference.

Indoor guideline values are provided for bedrooms with the aim of protecting against sleep disturbance, a guideline value of 30 dB L_{Aeq} for continuous noise and 45 dB L_{Amax} for single sound events is recommended. To enable casual conversation during the daytime an internal guideline noise level of 35 dB L_{Aeq} is provided.

With respect to external noise levels it is stated that:

> *"To protect the majority of people from being seriously annoyed during the daytime, it is recommended that the sound pressure level on balconies, terraces, and outdoor living areas should not exceed 55 dB L_{Aeq} for a steady continuous noise. To protect the majority of people from being moderately annoyed during the daytime, the outdoor noise level should not exceed 50 dB L_{Aeq}."*

A Guide to the Measurement and Prediction of the Equivalent Continuous Sound Level L_{eq}, Report by a Working Party for the Technical Sub Committee of the Council. Noise Advisory Council (NAC) (1978)

Produced for the Noise Advisory Council (NAC), this document states that it was prepared for use by practitioners with the appropriate technical background who need to measure or predict environmental noise. It presents general procedures to be followed for the measurement and prediction of Leq from a number of different sources.

Section 2.5 details a method for calculating the Leq noise level from the combined effect of a number of events (e.g. car pass-bys) with their own single event noise exposure level (L_{AX}, commonly also referenced as the SEL). The method is as follows:

$L_{eq} = L_{AX} + 10\log(n) - 10\log(T)$

Where:

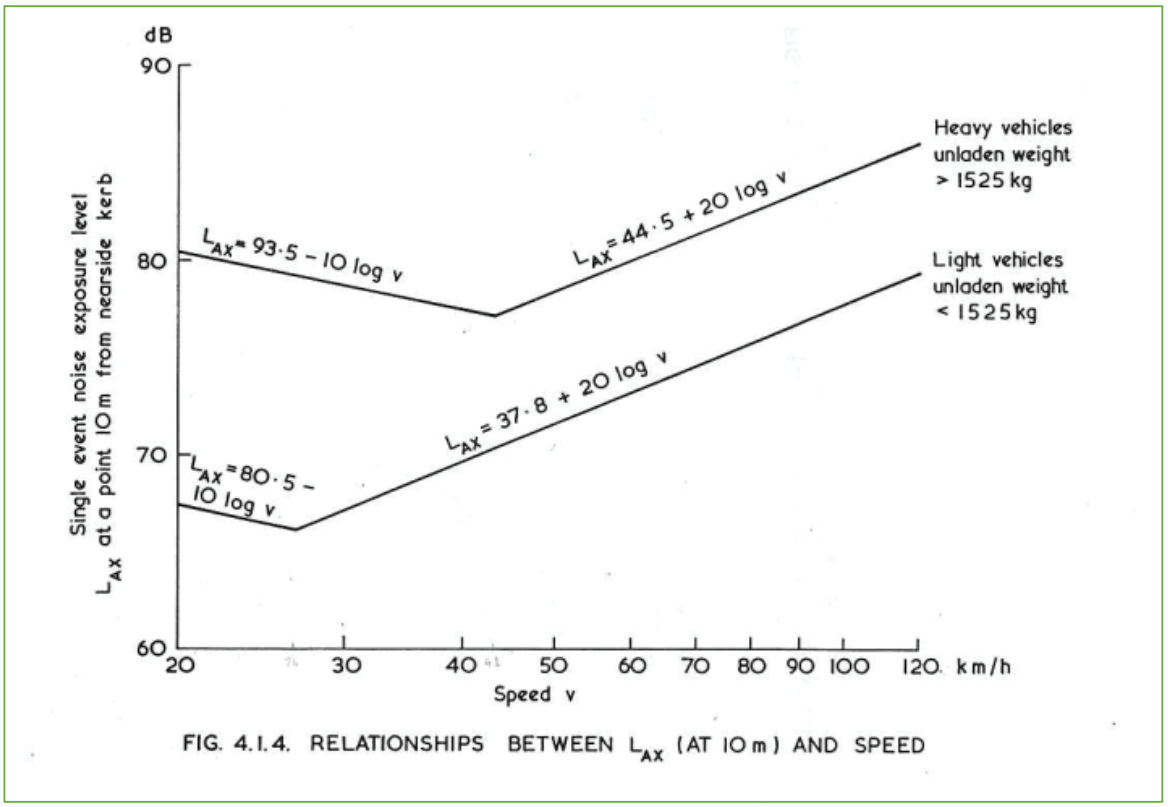
L_{AX} = single event noise exposure level of the event (SEL)

n = the number of events

T = the time in second

In addition, **Figure A5.1.1** presents Fig 4.1.4 from the NAC illustrating a method for determining the L_{AX} (SEL) at a distance of 10m from the nearside kerb edge, for heavy and light vehicles travelling at different speeds. This figure is duplicated below:

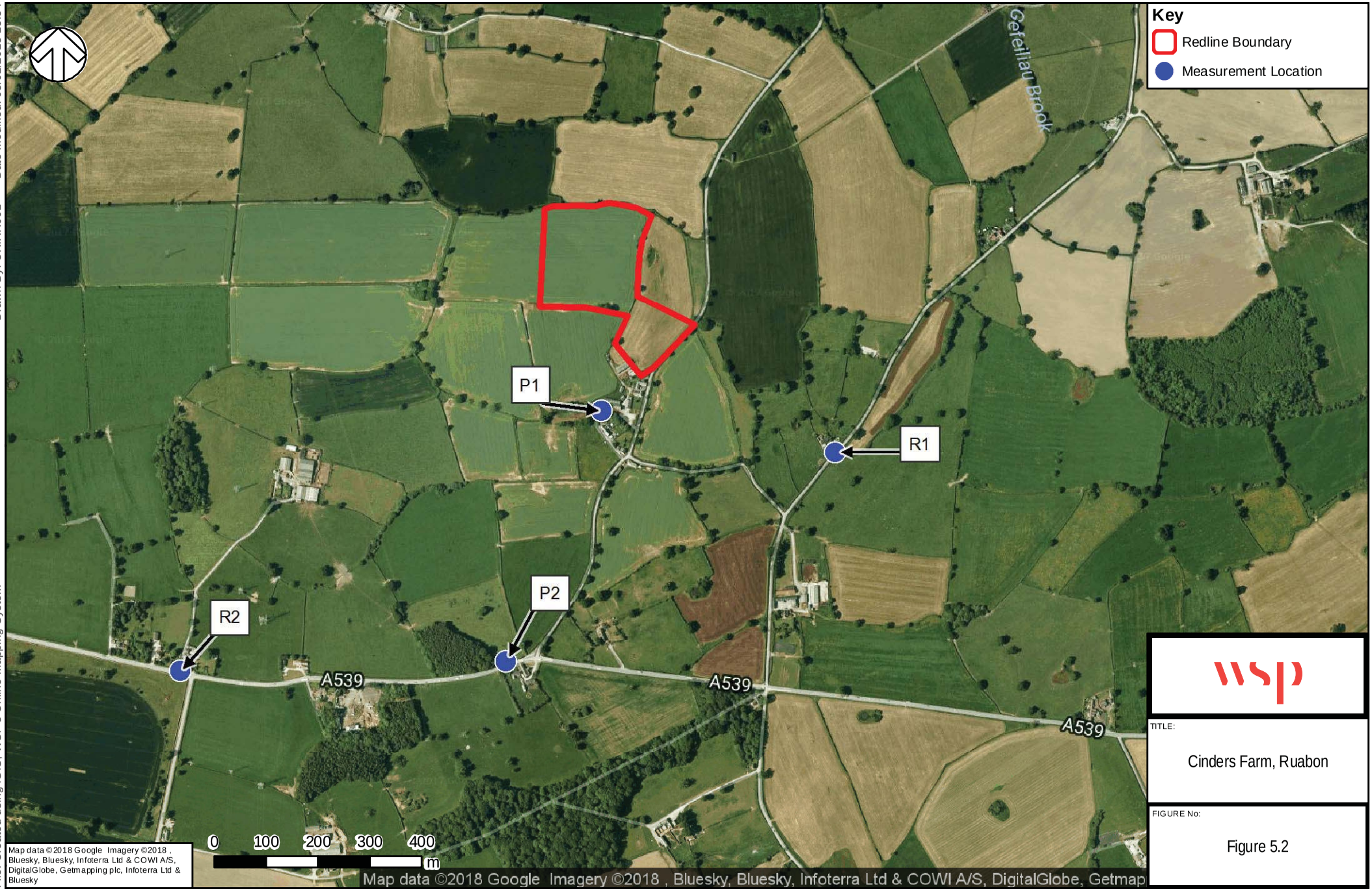
Figure A5.2.1: NAC Fig 4.1.4 Relationship Between L_{AX} (at 10m) and Speed



Combining the use of NAC Figure 4.1.4 with the equation adopted from NAC Section 2.5 provides a means of determining the L_{eq} from a road traffic source, for example where the number of pass-by events falls outside the range for valid calculations in accordance with CRTN.

Appendix 5.2


Key
Redline Boundary
Ruabon Rd
B5426
GYFELIA
B5426
B5426
Eyton
Crabtree Green
B5605
A483
B5097
High St
Ruabon
A539
A539
A539
A539
A483
WYNNSTAY PARK
0 200 400 600 800
m
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wsp
TITLE:
Cinders Farm, Ruabon
FIGURE No:
Figure 5.1



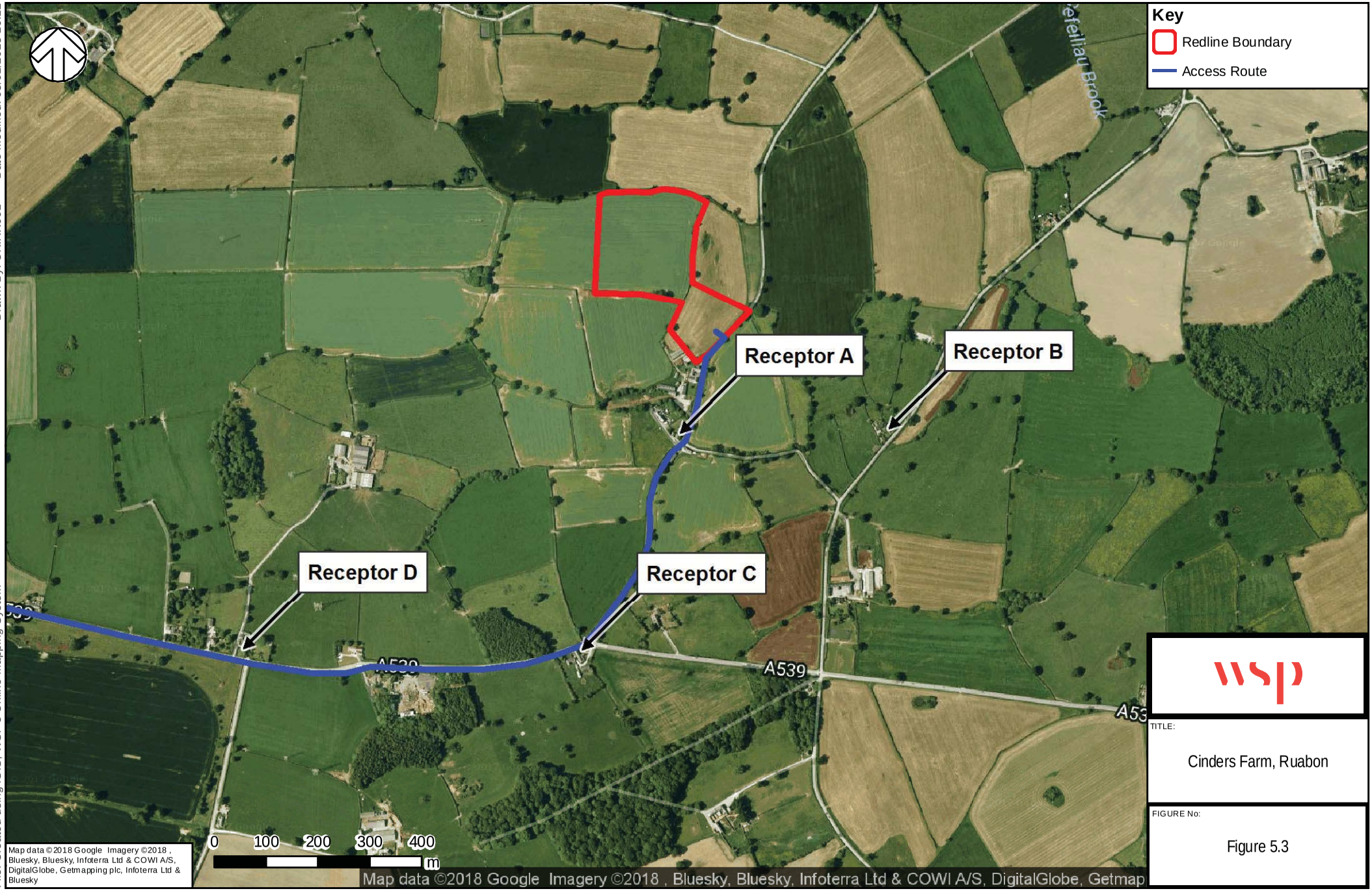
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Cinders Farm, Ruabon

FIGURE No:

Figure 5.2



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Cinders Farm, Ruabon

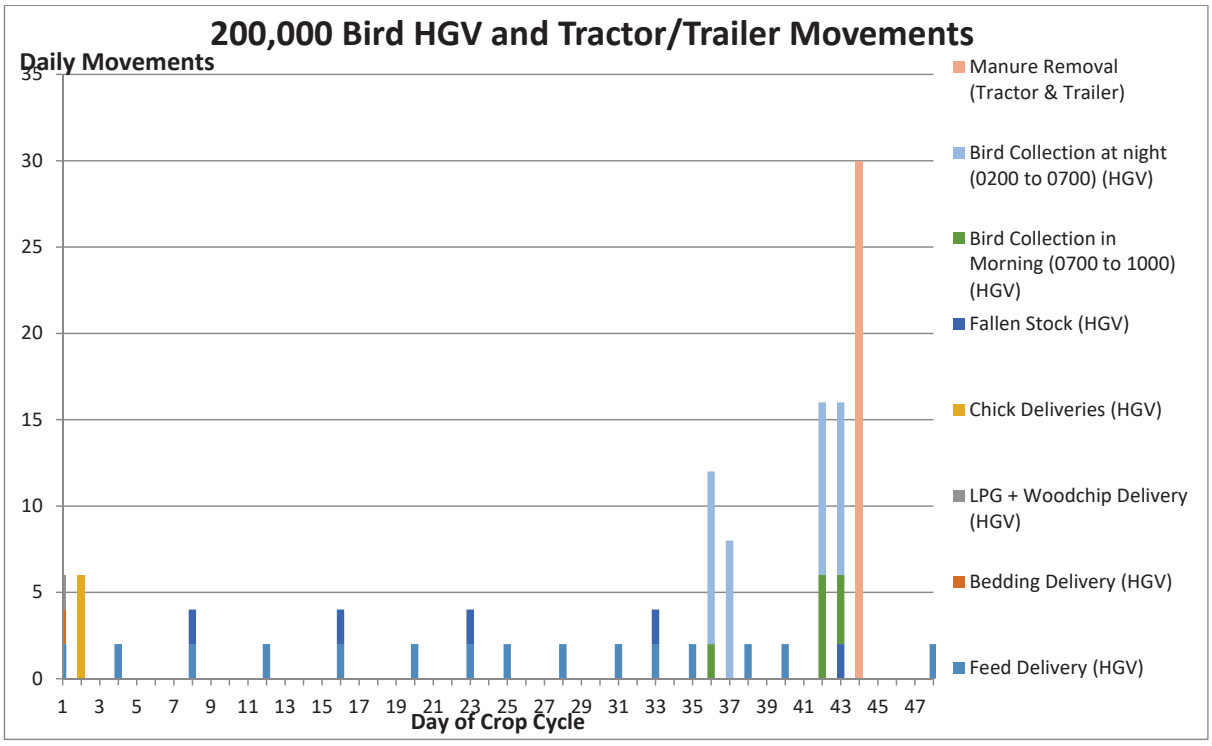
FIGURE No:

Figure 5.3

Appendix 5.3

Appendix 5.3 – Operational Transport Flows

Operational Traffic Flow Data



Source: SK Transport Planning

Operational Traffic Calculations

HGVs Daytime (07:00 - 23:00hrs) at 10.0m from roadside kerb

					AAWT18hr							Less 1000/18hr			
ID	**Road Name**	Link ID	**1 way /2 way**		**Flow (veh/hr)**	**Light Veh**	**% HDV**	**HDV numbers**	**Speed (kph)**	**Speed <20**		**BNL**	**Cars**	**HGVs**	**LAeq,16hr**
C	Access Route A539		2 way		6	0.0	100	6.0	64	64		LESS THAN 1000	0.0	40.9	40.9
A	Access Route Cinders Lane		2 way		6	0.0	100	6.0	48	48		LESS THAN 1000	0.0	38.3	38.3

HGVs Night-time (23:00 - 07:00hrs) at 10.0m from roadside kerb

ID	**Road Name**	Link ID	**1 way /2 way**		**Flow (veh/hr)**	**Light Veh**	**% HDV**	**HDV numbers**	**Speed (kph)**	**Speed <20**		**BNL**	**Cars**	**HGVs**	**LAeq,8hr**
C	Access Route A539		2 way		10	0.0	100	10.0	64	64		LESS THAN 1000	0.0	46.1	46.1
A	Access Route Cinders Lane		2 way		10	0.0	100	10.0	48	48		LESS THAN 1000	0.0	43.5	43.5

Appendix 6.1

Appendix 6.1

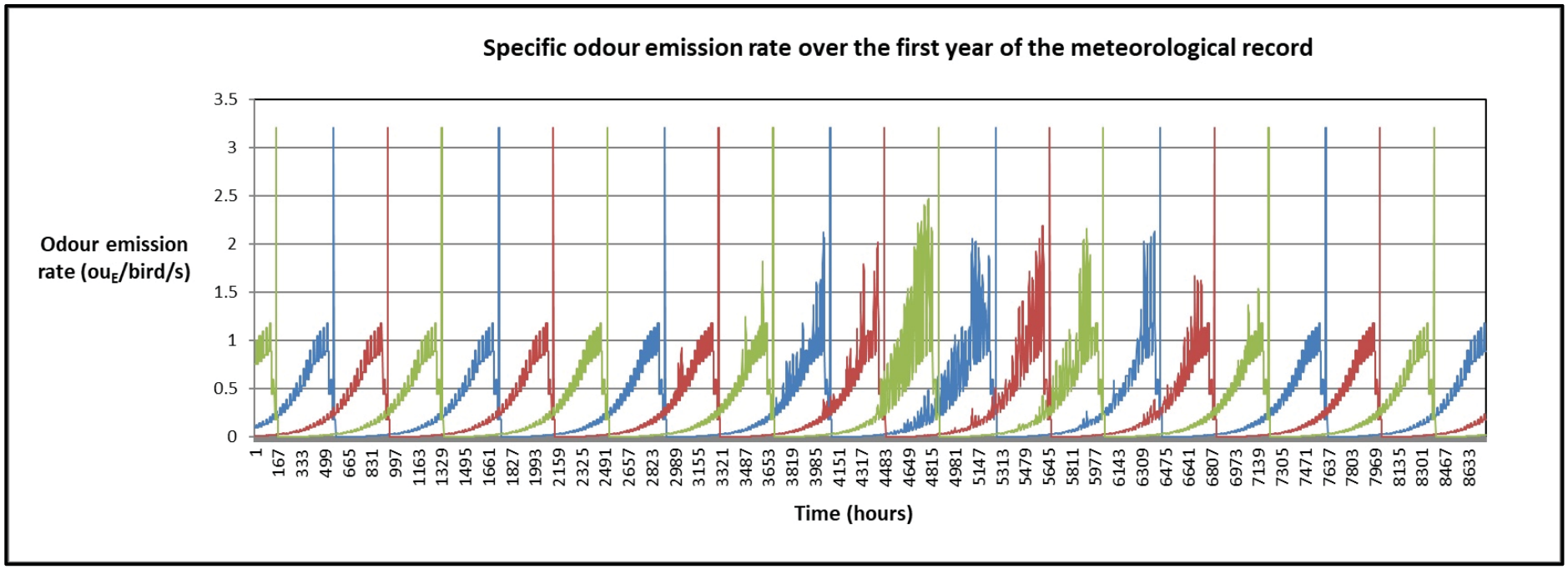
Figure 1. The area surrounding the site of the proposed poultry unit at Cinders Farm



Appendix 6.2

Appendix 6.2

Figure 2. Specific emission rate over the first year of each of the three crop cycles



Appendix 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 including: dry and wet deposition; NO_x 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.

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). Observational meteorological data from Hawarden and Shawbury is also considered.

The GFS is a spectral model and data are archived at a horizontal resolution of 0.25 degrees, which is approximately 25 km over the UK (formerly 0.5 degrees, or approximately 50 km). 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 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.

The wind rose for the raw GFS data at the site of Cinders Farm is shown in Figure 3a.

Wind speeds are modified by the treatment of roughness lengths (see Section 4.7) and because terrain data is included in the modelling, the raw GFS wind speeds and directions will be modified. The terrain and roughness length modified wind rose for the location of the proposed poultry houses at Cinders Farm is shown in Figure 3b. Note that elsewhere in the modelling domain the modified wind roses may differ more, or less, markedly and that the resolution of the wind field is 100 m.

Data from the meteorological recording stations at Hawarden and Shawbury have also been considered; these are the closest stations to Cinders Farm. However, neither Hawarden nor Shawbury is considered to have an aspect that in any way could be considered similar to that at Cinders Farm; therefore, it should be noted that the frequency of winds from a particular direction in the Hawarden or Shawbury data may be either high or low in comparison to what might occur at Cinders Farm, which means mean concentrations downwind may be either over or under predicted. Additionally, periods of light winds and calms cannot be properly modelled. Therefore, it is the opinion of AS Modelling & Data Ltd. that the results obtained using the GFS data, particularly when modified by using FLOWSTAR [1], are less likely to have gross errors than the results obtained using the observational data and should be given more weight when interpreting the results of the modelling. The wind rose for Hawarden is shown in Figure 3c and the wind rose for Shawbury is shown in Figure 3d.

1. When modelling complex terrain with ADMS, by default, the minimum turbulence length has 0.1 m added to the flat terrain value (calculated from the Monin–Obukhov length). Whilst this might be appropriate over hill/mountain tops in terrain with slopes > 1:10 in lesser terrain, it introduces model behaviour that is not desirable where FLOWSTAR is simply being used to modify the upwind flow. Specifically, the parameter sigma z of the Gaussian plume model is overly constrained, which for point sources emissions, may cause over prediction of ground level concentrations in stable weather conditions and light winds (Steven R. Hanna & Biswanath Chowdhury, 2013). Note that this becomes particularly important if calm and light wind conditions are not being ignored as they often are when using traditional observational meteorological datasets. To reduce this behaviour, where terrain is modelled, AS Modelling & Data Ltd. have set a minimum turbulence length of 0.025 m in ADMS. This approximates the normal behaviour of ADMS with flat terrain.

Figure 3a. The wind rose. Raw GFS derived data, for 52.987 N, 3.007 W, 2013-2016

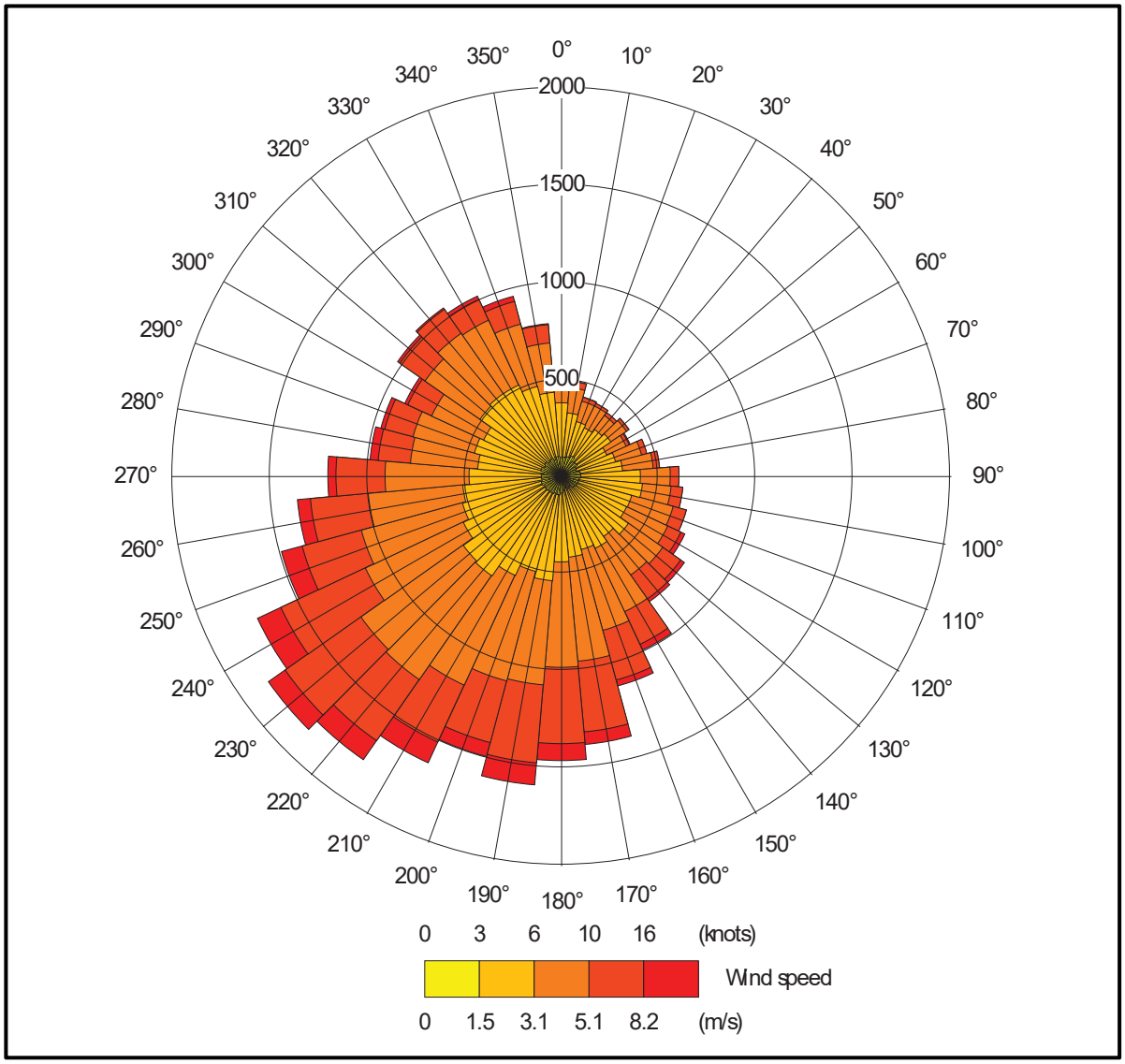


Figure 3b. The wind rose. FLOWSTAR modified GFS derived data for NGR 322400, 343850, 2013-2016

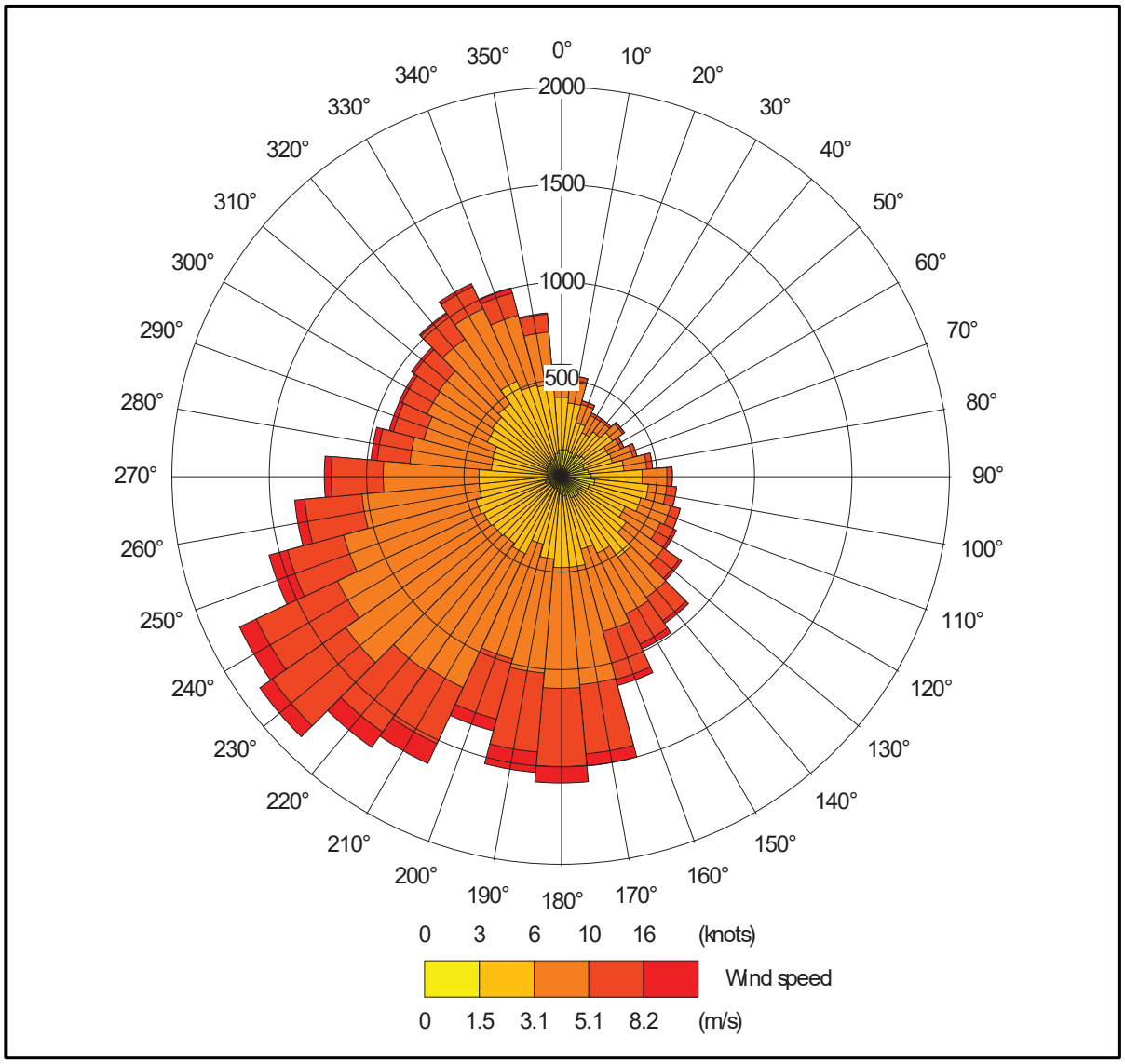


Figure 3c. The wind rose. Recorded meteorological data at Hawarden, 2013-2016

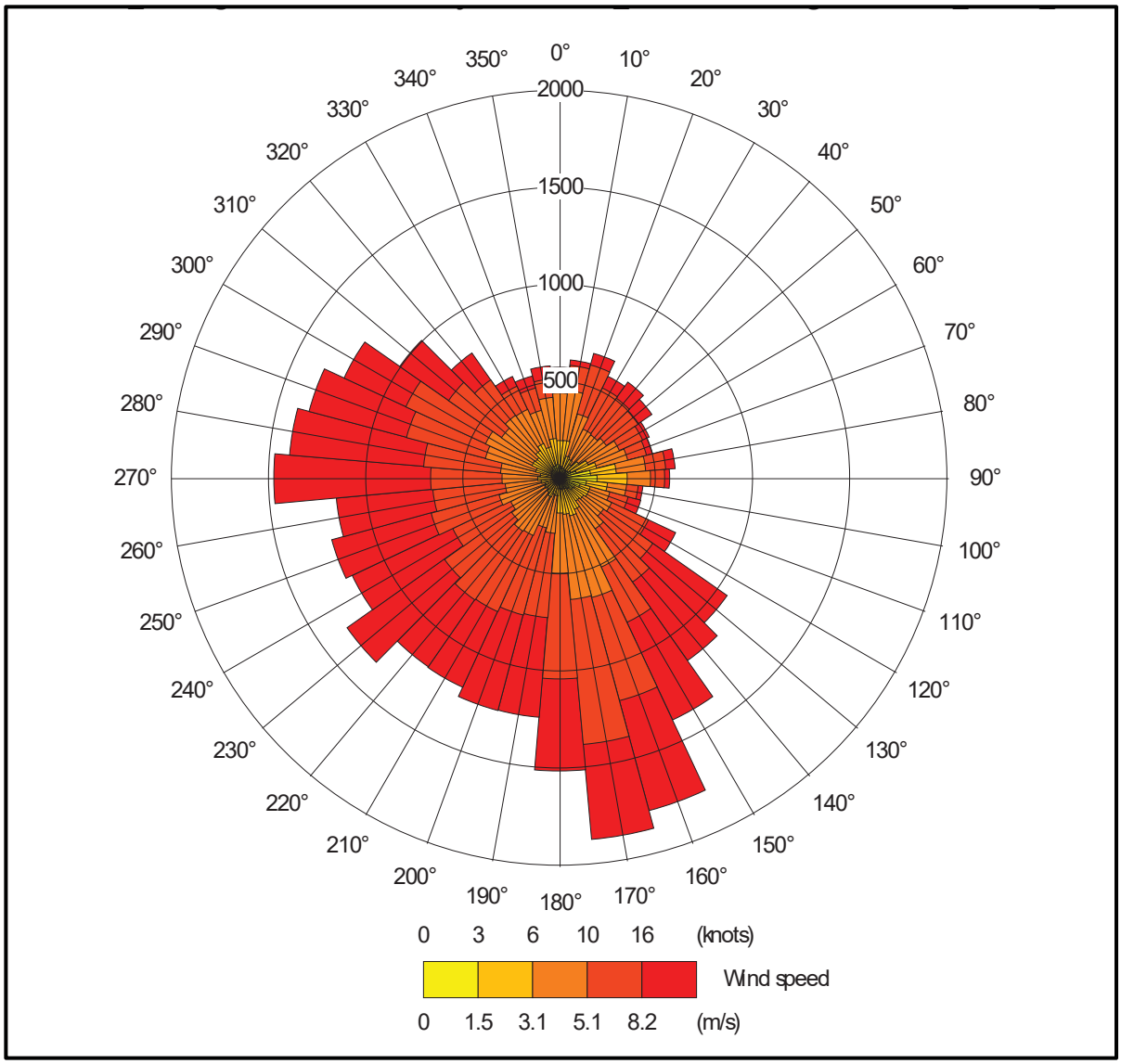
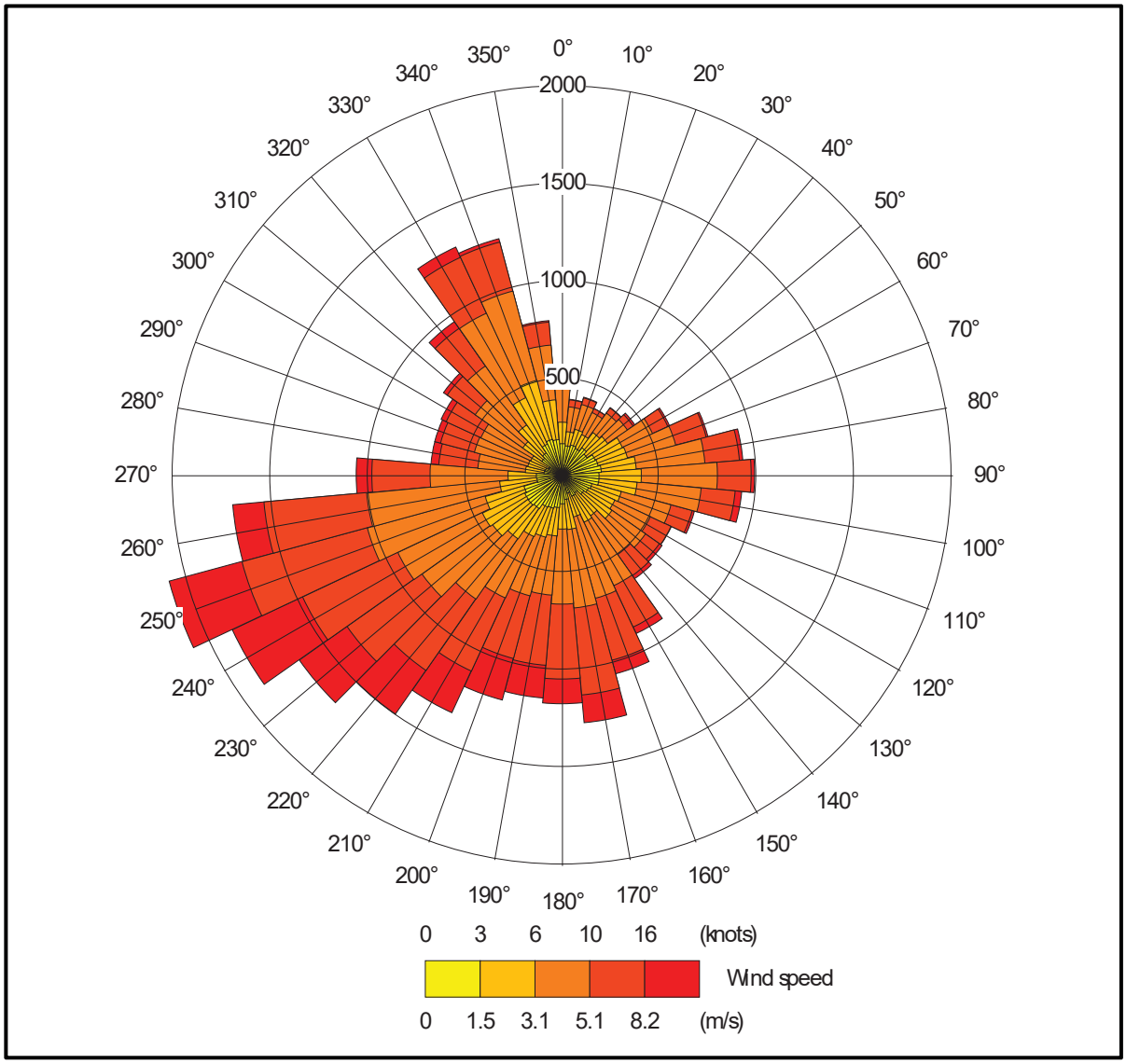


Figure 3d. The wind rose. Recorded meteorological data at Shawbury, 2013-2016



Emission sources
Emissions from the chimneys of uncapped high speed ridge fans on the proposed poultry houses are represented by three point sources per house within ADMS (PR1 to PR4; a, b & c). Details of the point source parameters are shown in Table 2 and their positions may be seen in Figure 4, where they are marked by red stars.

Table 2. Point source parameters

Source ID	Height (m)	Diameter (m)	Efflux velocity (m/s)	Emission temperature (˚C)	Emission rate per source (ou_E/s)
PR1 to PR4 a, b & c	6.0	0.8	11.0	Variable [1]	Variable [1]

1. Dependent on crop stage and ambient temperature.

Modelled buildings
The structure of the proposed poultry houses and other nearby buildings may affect the plumes from the point sources. Therefore, these buildings are modelled within ADMS. The positions of the modelled buildings may be seen in Figure 4, where they are marked by grey rectangles.

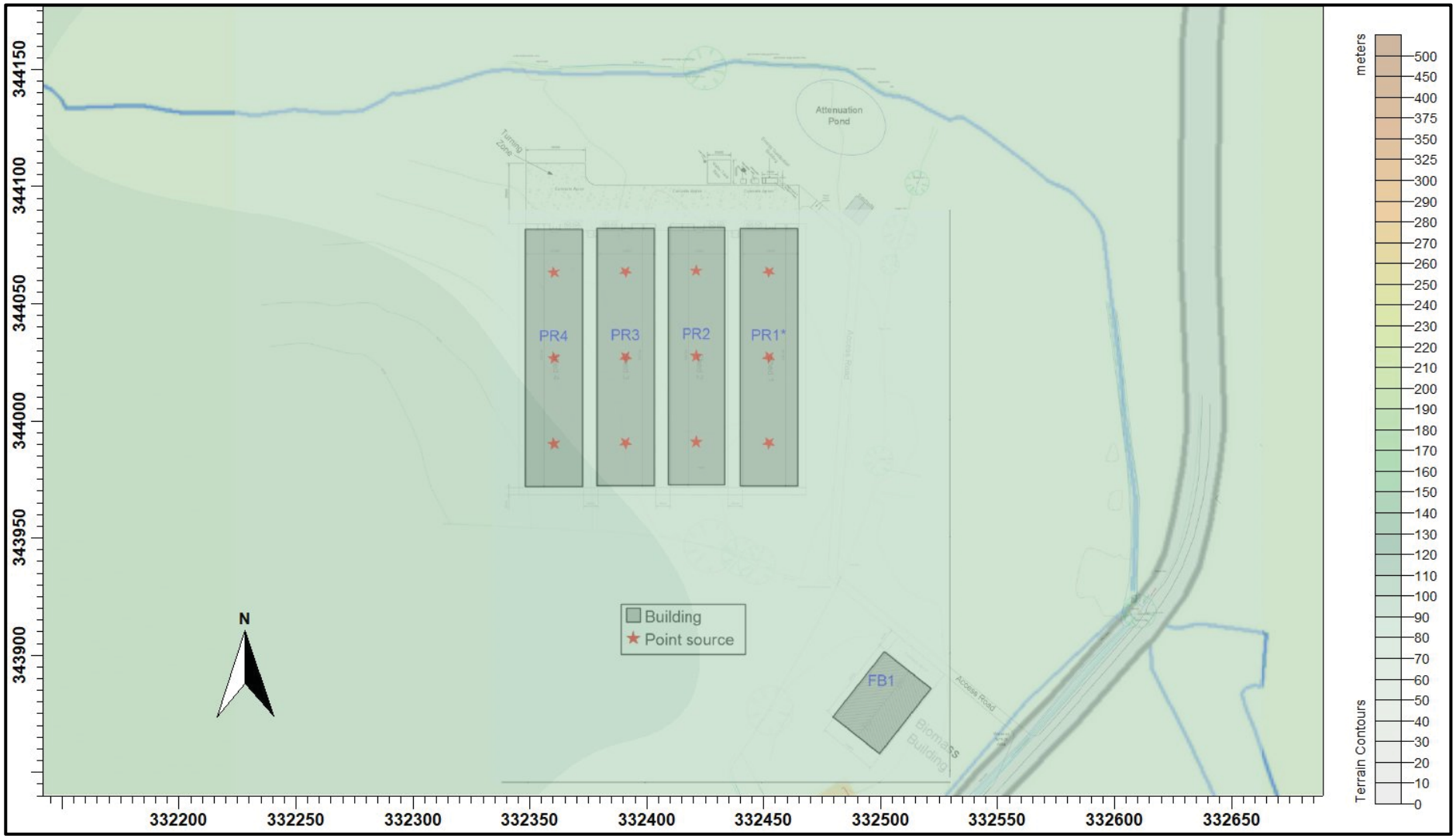
Discrete receptors
Twenty-five discrete receptors have been defined at a selection of nearby residences and commercial properties. The receptors are defined at 1.5 m above ground level within ADMS and their positions may be seen in Figure 5, where they are marked by enumerated pink rectangles.

Nested Cartesian grid
To produce the contour plots presented in Section 5 of this report, a nested Cartesian grid has been defined within ADMS. The grid receptors are defined at 1.5 m above ground level within ADMS. The positions of the grid receptors may be seen in Figure 5, where they are marked by green crosses.

Terrain data
There are some slopes that may affect wind flow and dispersion of odour in the area around the site; therefore, terrain has been considered in the modelling. The terrain data used are derived from the Ordnance Survey 50 m Digital Elevation Model. The terrain domain is 6.4 km by 6.4 km and FLOWSTAR is run at a resolution of 64 x 64 points; therefore, the effective model resolution is 100 m.

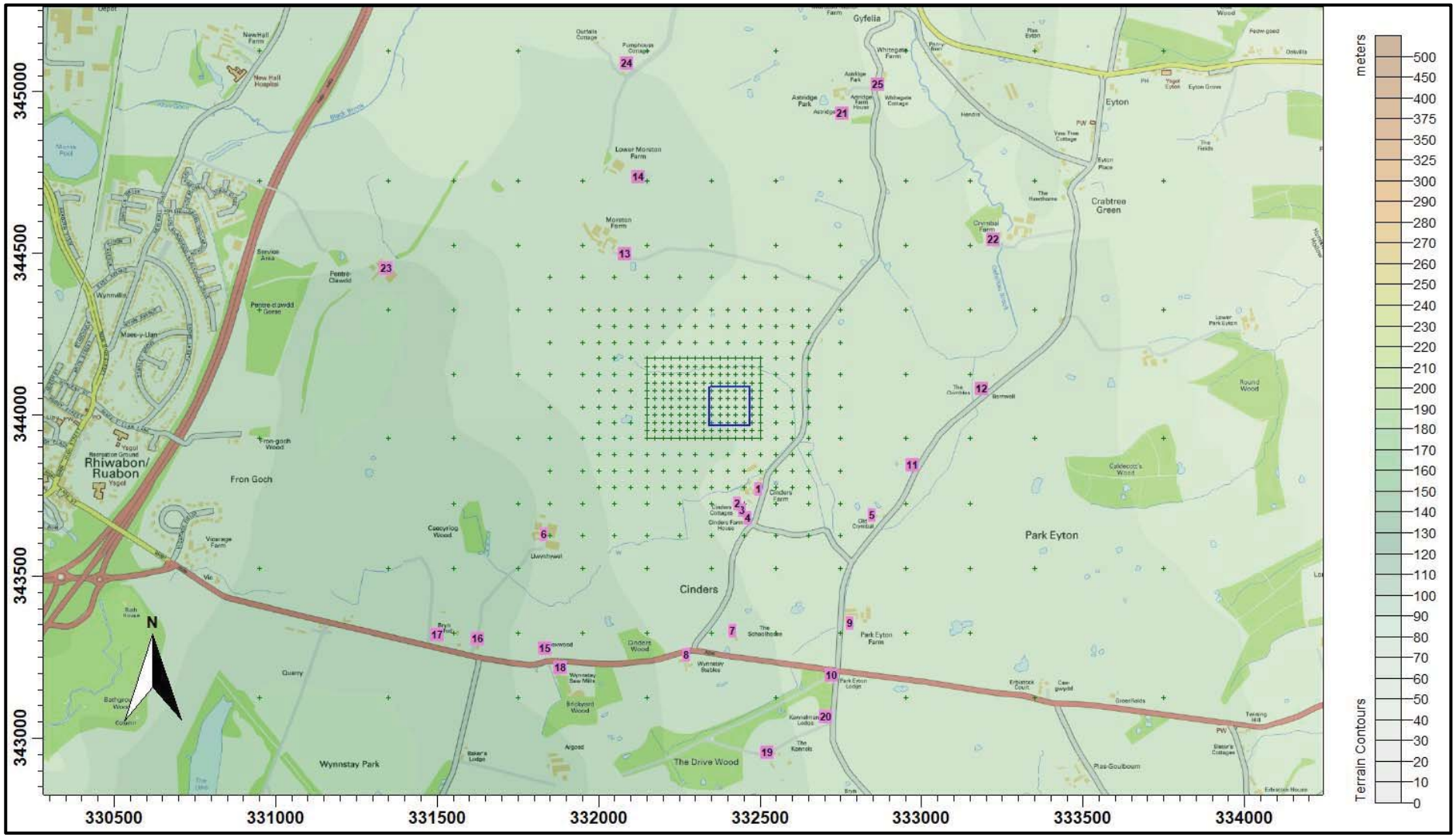
Other model parameters
A fixed surface roughness length of 0.3 m has been applied over the entire modelling domain. The GFS meteorological data is assumed to have a roughness length of 0.275 m. The effect of the difference in roughness length is precautionary as it increases the frequency of low wind speeds and the stability and therefore increases predicted ground level concentrations.

Figure 4. The positions of modelled buildings & sources



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Figure 5. The discrete receptors and nested Cartesian grid receptors



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Appendix 6.4

Table 2: Receptor sensitivity to odours

For the sensitivity of people to odour, the IAQM recommends that the Air Quality Practitioner uses professional judgement to identify where on the spectrum between high and low sensitivity a receptor lies, taking into account the following general principles:

High sensitivity receptor	Surrounding land where: • users can reasonably expect enjoyment of a high level of amenity; and • people would reasonably be expected to be present here continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. Examples may include residential dwellings, hospitals, schools/education and tourist/cultural.
Medium sensitivity receptor	Surrounding land where: • users would expect to enjoy a reasonable level of amenity, but wouldn't reasonably expect to enjoy the same level of amenity as in their home; or • people wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. Examples may include places of work, commercial/retail premises and playing/recreation fields.
Low sensitivity receptor	Surrounding land where: • the enjoyment of amenity would not reasonably be expected; or • there is transient exposure, where the people would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. Examples may include industrial use, farms, footpaths and roads.

3.2 General Approach to Assessing Odour Effects for Planning

Being able to use the assessment tools and understanding the meaning of the results are two distinct skills. Most of the odour assessment tools measure odour exposure (i.e. impact), or some other parameter; very few of the tools measure the resulting *effect* (e.g. annoyance or nuisance) directly - and none measures disamenity specifically. Nevertheless, planning policy (NPPF, Para 120), requires that the *effects* of pollution on health, the natural environment or general amenity should be taken into account. Furthermore, the EIA regulations require that an assessment reaches a conclusion on the likely *significance* of the effect. Therefore an assessment has to to go further than simply estimating the odour exposure/impact and attempt to gauge the *magnitude of the effect* resulting from that impact on a receptor of a particular sensitivity. This is a matter of judgement that cannot easily be defined by scientific methods alone and ideally requires a wider societal or stakeholder consensus to be arrived at. It is generally agreed that a high sensitivity receptor subject to a large odour exposure will experience a substantial-adverse effect, and a low sensitivity receptor subject to a small odour exposure will experience a negligible effect; however, between these extremes the various combinations will give rise to a gradation of effects for which no descriptor terms have been universally agreed. **Table 3** shows the IAQM's proposed general framework of descriptors for the magnitude of effects for receptors of different sensitivities receiving different odour exposures. This framework will be kept under review to benefit from the feedback of affected or interested parties.

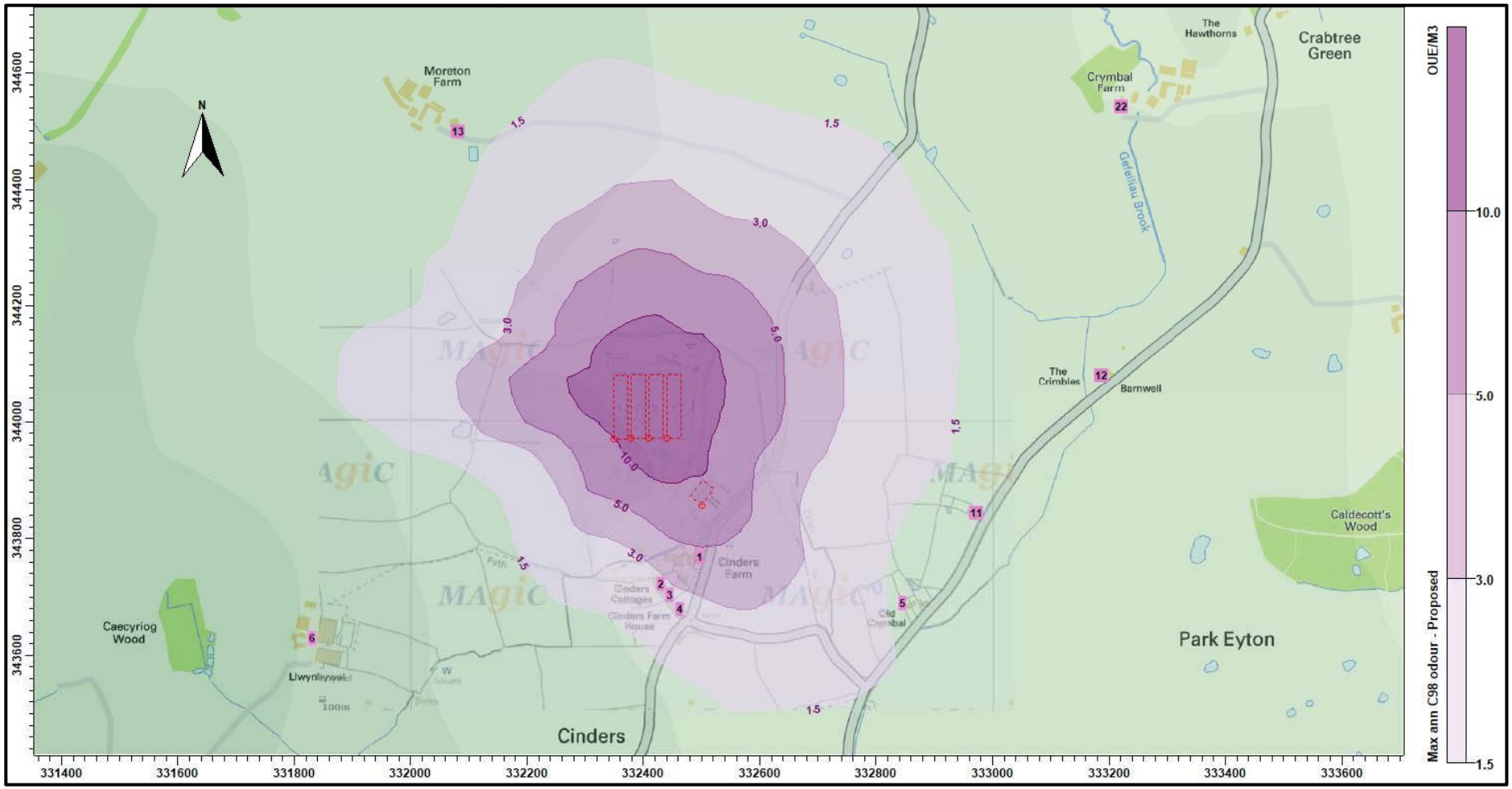
Table 3 describes a general relationship between the level of odour exposure (impact) experienced by a receptor of a given sensitivity and the magnitude of adverse effect that is likely to result. This general relationship for an odour* will hold irrespective of the particular tool or method (e.g. modelling, qualitative assessment, or monitoring) that has been used. It is necessary to ensure that the result from whichever assessment tool is used, is properly matched up to the correct descriptor term (i.e. very large, large, medium, small or negligible exposure) on the exposure/impact scale#. This is covered in detail in the later sections and appendices of this guidance.

* A different relationship may hold for other pollutants, e.g. dusts or chemical species. For example, exposure to very toxic chemicals may cause a highly significant effect at even small levels of exposure.

The effects matrices for different tools, although based on Table 3, will not necessarily be identical because different tools may cover different parts of the odour exposure scale.

Appendix 6.5

Figure 6. Predicted maximum annual 98th percentile hourly mean odour concentration

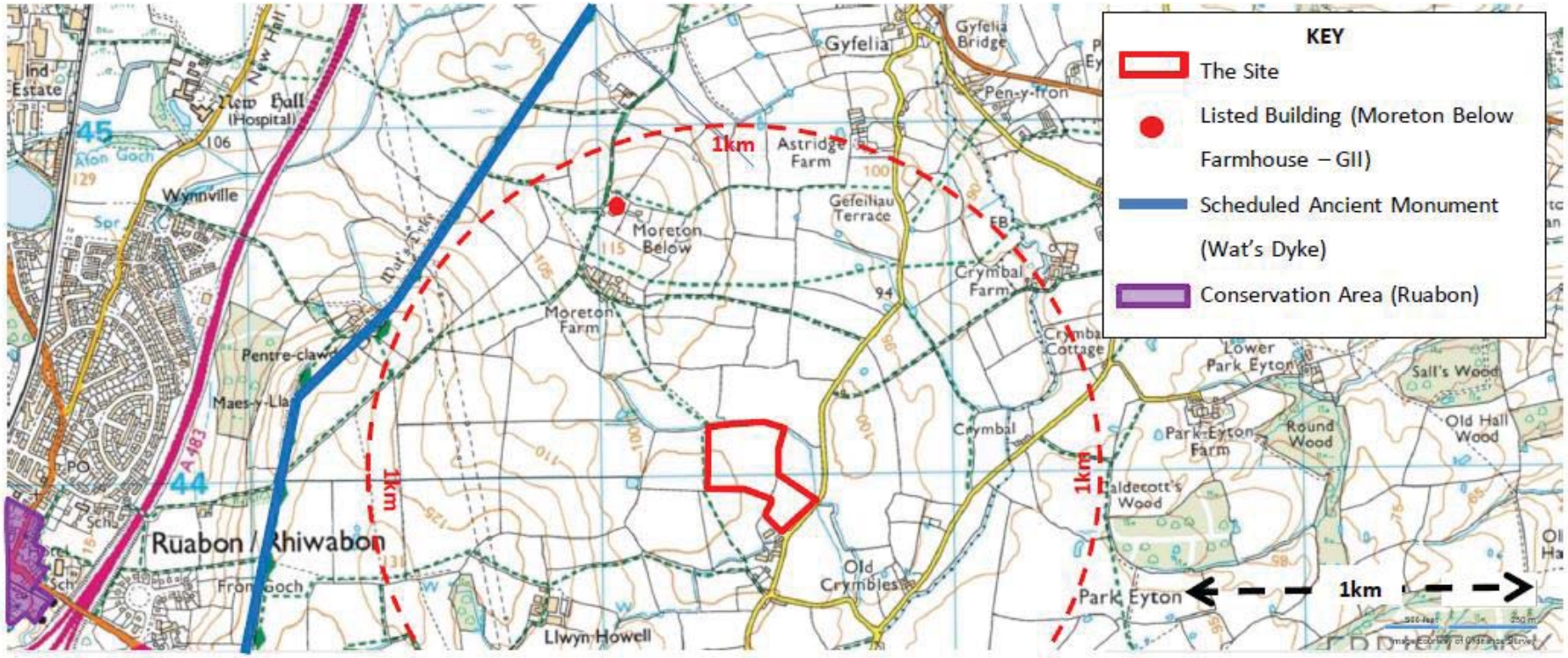


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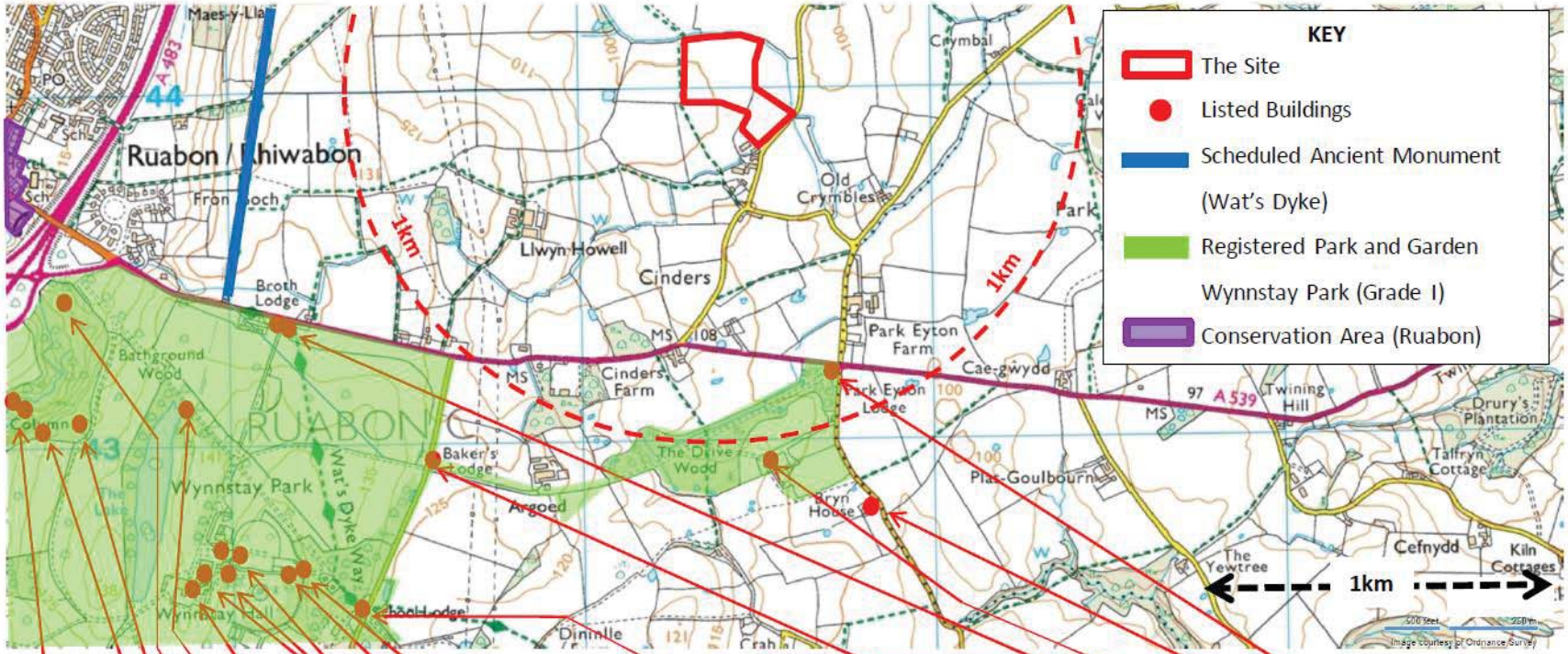
Appendix 7.1

Appendix 7.1. Location of Heritage Assets around Cinders Farm Site

Cinders Farm, Ruabon, Wrexham **Location of Heritage Receptors (North of the Site)** **Figure 1**



Cinders Farm, Ruabon, Wrexham **Location of Heritage Receptors (South of the Site)** **Figure 2**



1 & 2. Sluice & Cascade (GII)

3. Ice House (GII)

4. Column (GII*)

5. Bath House (GII*)

6, 7, 8, 9, 10 & 11 Ancillary buildings to Wynnstay Hall (GII)

12. Wynnstay Hall (GII*)

13. Boat House (GII)

14. Bakers Lodge (GII)

15, 16 & 17 School Lodge, School & School House (GII)

18 & 19 Tunnel and Ha Ha (GII)

20. Dairy (GII*)

21. Park Eyton Lodge (GII)

22. Bryn House (GII)

23. Wynnstay Kennels (GII)

24 & 25. Broth Lodges (GII)

Appendix 7.2

Appendix 7.2

Criteria for the Assessment of Impact and Effect upon the setting of Heritage assets

1.1 Assessment of the impact of the Proposal upon the setting of Heritage Assets utilises the adopted methodological approach supported by CADW in their publication *The settings of Heritage Assets in Wales* (2017). This advises that both assessors and decision makers should consider undertaking a four stage process when assessing the impact of a proposed change or development within the setting of historic assets as follows:

1. *Identify the historic assets that might be affected by a proposed change or development.*
2. *Define and analyse the settings to understand how they contribute to the significance of the historic assets and, in particular, the ways in which the assets are understood, appreciated and experienced.*
3. *Evaluate the potential impact of a proposed change or development on that Significance.*
4. *If necessary, consider options to mitigate or improve the potential impact of a proposed change or development on that significance.*

<u>Identification of Effects</u>

1.2 The significance of the affected Heritage Assets and the nature of the impact will determine the magnitude and significance of the effect. The criteria for establishing the importance (significance) of historic buildings and areas are set out in Table 7.1. In addition to the broader classification of statutory and non-statutory designations the significance of each individual Heritage Asset must be assessed. This assessment should distil the characteristics for which the asset has been identified as being important.

1.3 Guidance for this assessment is provided in Cadw publication *Conservation Principles for the sustainable management of the historic environment in*

Wales in 2011. The guidance sets out four heritage values which need to be understood before the significance of the asset can be assessed.

- Evidential value
- Historical value
- Aesthetic value
- Communal value

Table 7.1: Criteria for assessing Importance

Importance	Criteria
International	World Heritage Sites
National	Listed Buildings Grade I & II* Listed Buildings Grade II Conservation Areas Scheduled Ancient Monuments with standing remains Registered Historic Parks & Gardens Registered Battlefields
Regional	Undesignated Heritage Assets possessing regional distinctiveness or associations with historic regional industry, events or people
Local	Undesignated Heritage Assets possessing local distinctiveness or associations with historic local, events or people Buildings or structures of architectural interest which do not fulfil the criteria for inclusion on the Secretary of State's list
None	Buildings, structures or areas which do not possess any attributable heritage value

Prediction of Effect Magnitude

1.4 The magnitude of the effect that the impact of the development would have on the significance of a Heritage Asset is broadly classified in table 7.2.

Table 7.2 Criteria for appraisal of Effect Magnitude

Magnitude of effect	Criteria
Adverse (Very High to High)	Substantial harm to or loss of a designated Heritage Asset. Substantial harm to the setting of a designated Heritage Asset.
Adverse (Medium to Low)	Less than substantial harm to, or loss of a designated Heritage Asset Substantial harm to or loss of an undesignated Heritage Asset. Less than substantial harm to the setting of a designated Heritage Asset. Loss or impact upon the significance of an undesignated Heritage Asset.
None	No impact upon Heritage Assets.
Beneficial (Low to Medium)	Makes a positive contribution to local character and distinctiveness. Sustains and enhances the significance of Heritage Assets and puts them to viable uses consistent with their conservation. Better reveals the significance of a Heritage Asset. Preserves or enhances the character or appearance of a Conservation Area.
Beneficial (High to Very High)	Sustains and enhances the significance of Heritage Assets and puts them to viable uses consistent with their conservation. Better reveals the significance of a Heritage Asset. Preserves or enhances the character or appearance of a Conservation Area.

Assessment of Effect Significance

1.5 The assessment of importance of the Heritage Assets (receptors) and the magnitude of any predicted effect resultant from the Proposal has been undertaken utilising the criteria set out in Table 7.1 and 7.2 above. Using the assigned criteria a value can be attributed to the significance of the effect. in line with previous published guidance including the 2006 Draft DCLG guidance: Environmental Impact Assessment: A guide to good practice and procedures.

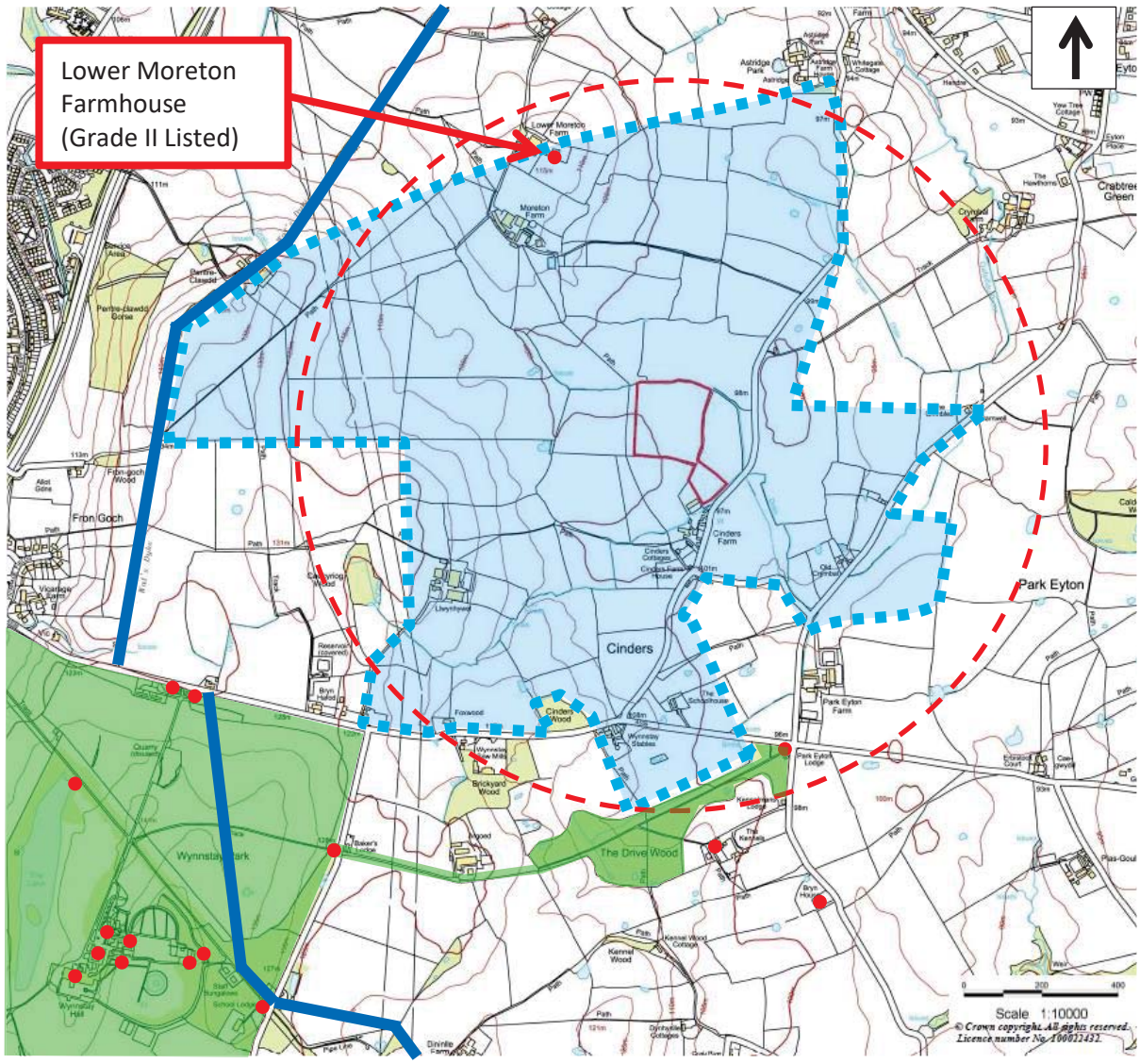
Table 7.3 Criteria for appraisal of Effect Significance

Significance of the effect	Criteria
Extreme	These effects represent key factors in the decision-making process. They are generally, but Not exclusively associated with Sites and features of national importance and resources/features which are unique and which, if lost, cannot be replaced or relocated.
Major	These effects are likely to be important considerations at a regional or district scale but, If adverse, are potential concerns to the project, depending upon the relative importance attached to the issue during the decision making process.
Moderate	These effects, if adverse, while important at a local scale, are not likely to be key decision making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource.
Minor	These effects may be raised as local issues but are unlikely to be of importance in the decision making process. Nevertheless, they are of relevance in the detailed design of the project.
Negligible	Effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Table 7.4: Matrix for assessing Effect Significance

Importance of Resource	Quantitative (Scale of) Predicted Significance of Effects				
	Adverse (Very High to High)	**Adverse (Medium to Low)**	**No Effect**	**Positive (Low to Medium)**	**Positive (Very High to High)**
National	Extreme/Major (Negative)	Moderate/Minor (Negative)	None	Moderate (Positive)	Major (Positive)
Regional	Moderate (Negative)	Moderate/Minor (Negative)	None	Moderate/Minor (Positive)	Moderate (Positive)
Local	Minor (Negative)	Minor (Negative)	None	Minor (Positive)	Minor (Positive)
None	Negligible	Negligible	None	Negligible	Negligible

Appendix 7.3



KEY

- The Site
- Listed Buildings
- Scheduled Ancient Monument (Wat's Dyke)
- Registered Park and Garden Wynnstay Park (Grade I)
- Approximate 1km radius from the site
- Approximate Visual Envelope (Alan Moss Associates)

Appendix 7.3. Intervisibility of Heritage Assets around Cinders Farm Site

Appendix 7.4

Appendix 7.4 Images of views towards Lower Moreton Farmhouse



Figure 7.4.1 View towards Lower Moreton Farmhouse from the Northern Site boundary



Figure 7.4.2 Telephoto (enlarged) image of Lower Moreton Farmhouse looking North-West from close to the Northern Site boundary



Figure 7.4.3 View of Lower Moreton Farmhouse looking South-East showing context

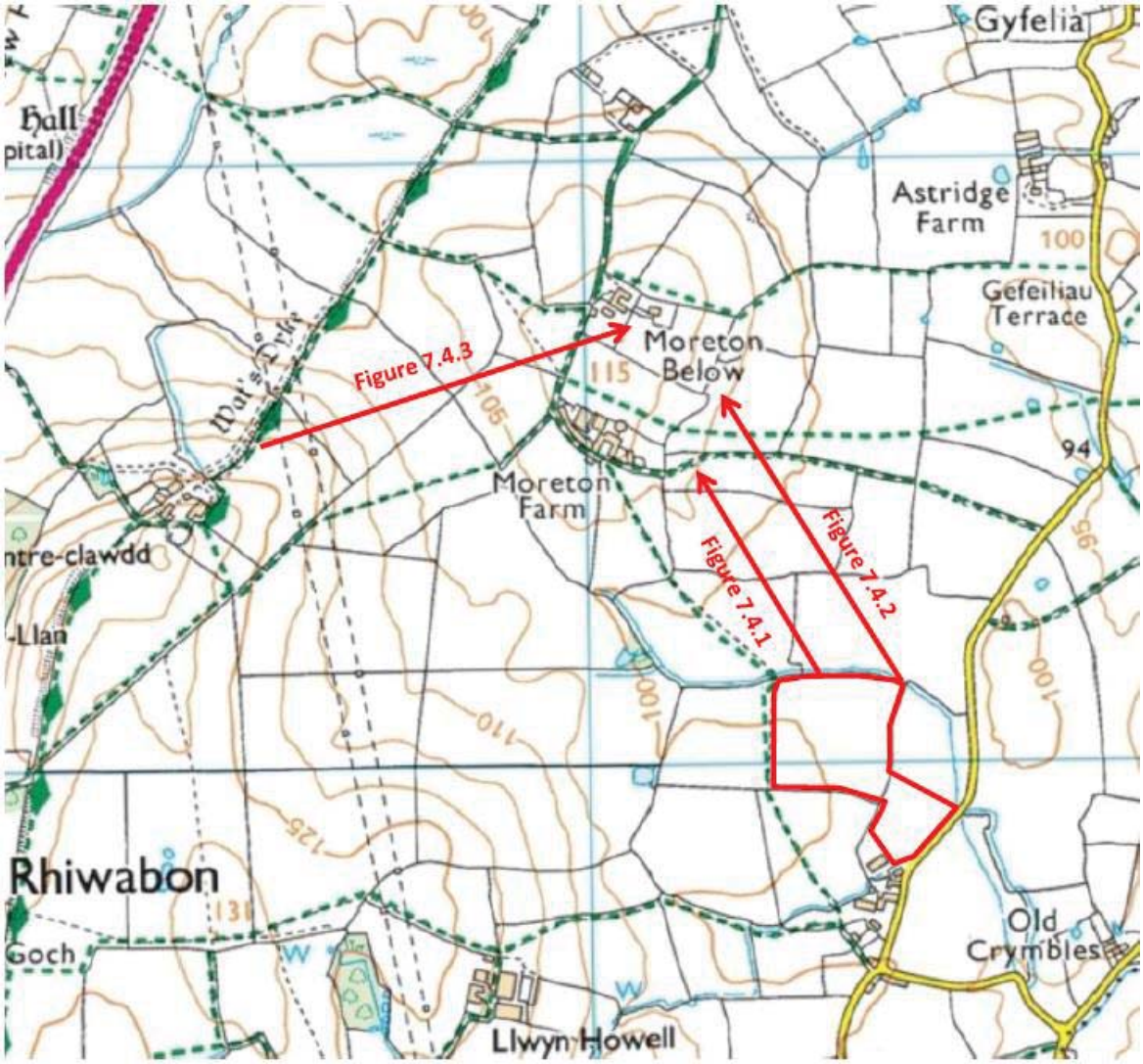
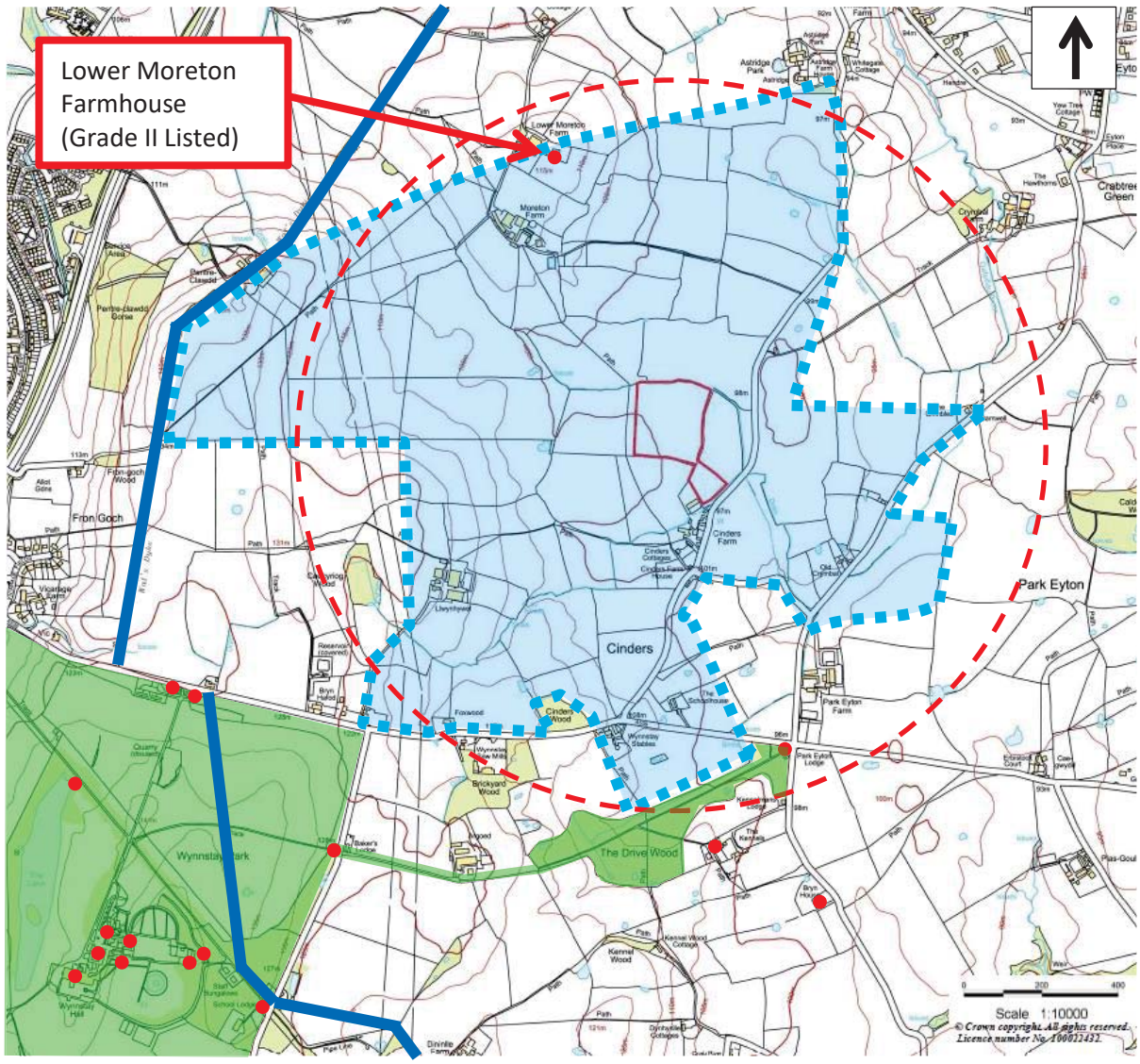


Figure 7.4.4 Location of photographic positions towards Lower Moreton Farmhouse

Appendix 7.5



KEY

- The Site
- Listed Buildings
- Scheduled Ancient Monument (Wat's Dyke)
- Registered Park and Garden Wynnstay Park (Grade I)
- Approximate 1km radius from the site
- Approximate Visual Envelope (Alan Moss Associates)

Figure 7.1. Location of Heritage Assets around Cinders Farm site

Appendix 8.1

aeon archaeology

Cinders Farm, Ruabon, Wrexham LL14 6HL.

December 2017
V 1.0



Archaeological Assessment
Project Code: A0142.1
Report no. 0152

aeon archaeology

Cinders Farm, Ruabon, Wrexham LL14 6HL.

December 2017
V 1.0

Report no. 0152

Archaeological Assessment

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25, Mold Road
Broughton
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CH4 0PQ

Written by: Richard Cooke BA MA MCIfA

Checked by: Josh Dean BA ACIfA

REGISTERED ORGANISATION CIfA

Project Code: A0142.1
Date: 20/12/2017
Client: Indigo Planning
info@aeonarchaeology.co.uk

Figures

Figure 01: Location of proposed development site at Cinders Farm, Ruabon. Scale 1:20,000 at A4.

Figure 02: Location of proposed development site at Cinders Farm, Ruabon. Scale 1:5,000 at A4.

Figure 03: Location of non-designated monuments from the Clwyd-Powys Historic Environment Record (HER) within 1.0km of the centre of the proposed development site at Cinders Farm, Ruabon. Scale 1:15,000 at A4.

Figure 04: Location of non-designated monuments from the National Monuments Record (NMR) within 1.0km of the centre of the proposed development site at Cinders Farm, Ruabon. Scale 1:15,000 at A4.

Figure 05: Location of Scheduled Ancient Monuments (SAMs) within 1.5km of the centre of the proposed development site at Cinders Farm, Ruabon. Scale 1:15,000 at A4.

Figure 06: Location of the proposed development site at Cinders Farm, Ruabon on the Ruabon tithe map of 1845.

Figure 07: Location of the proposed development site at Cinders Farm, Ruabon on the First Edition 6" County Series Ordnance Survey map of 1879.

Figure 08: Location of the proposed development site at Cinders Farm, Ruabon on the Second Edition 6" County Series Ordnance Survey map of 1900.

Figure 09: Location of the proposed development site at Cinders Farm, Ruabon on the Third Edition 6" County Series Ordnance Survey map of 1914.

Figure 10: Location of the proposed development site at Cinders Farm, Ruabon on the Third Edition 6" County Series Ordnance Survey map of 1938.

Figure 11: Location of the proposed development site at Cinders Farm, Ruabon on the RAF aerial photograph of 1946.

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Plate 10: View from Wat's Dyke Scheduled Ancient Monument (DE155) towards the proposed development site (shaded red), from the west.

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1.0 NON-TECHNICAL SUMMARY

Aeon Archaeology was commissioned by Indigo Planning on behalf of Wynnstay Home Farm Partnership to carry out an archaeological assessment and field visit of a proposed development to include the erection of four agricultural buildings for rearing livestock (table fowl); ancillary buildings and plant; associated infrastructure; and landscaping in advance of planning application. The proposed development site is to be located on circa 4.8 hectares of gently sloping arable land located to the northwest of Cinders Farm, Ruabon, in the County Borough of Wrexham, North Wales

The assessment has established that the Proposal will directly physically impact upon three sites – two field boundaries (features 1 and 2) and extant field boundaries (feature 5). Features 1 and 2 are considered to be of local importance and will require breaching by the proposed access road resulting in a neutral/slight significance of effect. As such recommendations have been made for a basic record of these hedgerows prior to breaching, however the record presented in this report is considered commensurate with a basic record level and as such no further recommendations are made for these features.

Feature 5 consists of three field boundaries now removed and as such their level of preservation is unknown but remains are likely to persist in some form at buried sub-surface level. The Proposal will result in the removal of this feature however its importance is considered to be negligible and as such will result in a slight adverse significance of effect. Therefore no further assessment or mitigatory measures are made for this feature.

The Proposal is also expected to have a negligible to low adverse visual impact when viewing east from approximately 720.0m of the Scheduled Ancient Monument of Wat's Dyke resulting in a slight adverse significance of effect. As the expected effect level of the Proposal is so slight no further recommendations for assessment or mitigatory measures are proposed aside from contacting Cadw to inform them of the Proposal.

It has been determined that the Site would have been conducive to habitation throughout antiquity and as such it is recommended that a geophysical survey be undertaken to ascertain whether any preserved buried remains persist at the Site. The results of the survey will inform whether any further assessment or mitigatory measures are required.

2.0 INTRODUCTION, AIMS AND PROJECT DESIGN

Aeon Archaeology was commissioned by Indigo Planning on behalf of Wynnstay Home Farm Partnership, hereafter the Client, to carry out an archaeological assessment and field visit of a proposed development, hereafter the Proposal, to include the erection of four agricultural buildings for rearing livestock (table fowl); ancillary buildings and plant; associated infrastructure; and landscaping in advance of planning application. The proposal site, hereafter the Site, is located on circa 4.8 hectares of gently sloping arable land located to the northwest of Cinders Farm, Ruabon, in the County Borough of Wrexham, North Wales (centred on **NGR SJ 32436 44018**) (figures 1 and 2).

A mitigation brief was not prepared for this scheme by the Clwyd-Powys Archaeological Trust (CPAT) Development Control Archaeologist as the Client has commissioned the assessment report in advance of planning application and as part of a scoping study for the development of the site.

This archaeological assessment is for the proposed development area, which includes parts of two large grazing fields enclosed by hedgerows. The assessment considers the impact of the Proposal upon the upstanding and buried archaeological remains at the Site, as well as the impact upon the setting of any Scheduled Ancient Monuments (SAMs). This report should be read in conjunction with the Heritage Assessment report undertaken by Castle House Heritage Consulting Ltd which considers the impact of the Proposal upon Listed Buildings, Conservation Areas, and Registered Historic Parks and Gardens.

As part of the archaeological assessment a 1.0km search area centred on the proposed development site was utilised for a search of the Clwyd-Powys Historic Environment Record (HER). This provided a background historical narrative of the area and included source material from the Wrexham Archives and Local Studies Service, Wrexham County Borough Museum and Archives, Regent Street, Wrexham LL11 1RB. Information regarding the National Monuments Record (NMR) was obtained from the Royal Commission on the Ancient and Historic Monuments in Wales (RCAHMW) Aberystwyth.

The following report conforms to the guidelines specified in *Standard and Guidance for Archaeological Desk-based Assessment* (Chartered Institute for Archaeologists, 2014), and meets the requirements of Planning Policy Wales Technical Advice Note 24 (TAN 24); and the Historic Environment Act (Wales) 2015.

The archaeological assessment considered the following:

(i) The history of the site;
(ii) The significance of any remains in their context both regionally and nationally;
(iii) The potential impact of the proposed development on known sites of archaeological importance including their setting.

The archaeological assessment was undertaken in four stages:

(i) Archival research
(ii) Field visit/site walkover of all accessible areas
(iii) Written report
(iv) Project archive

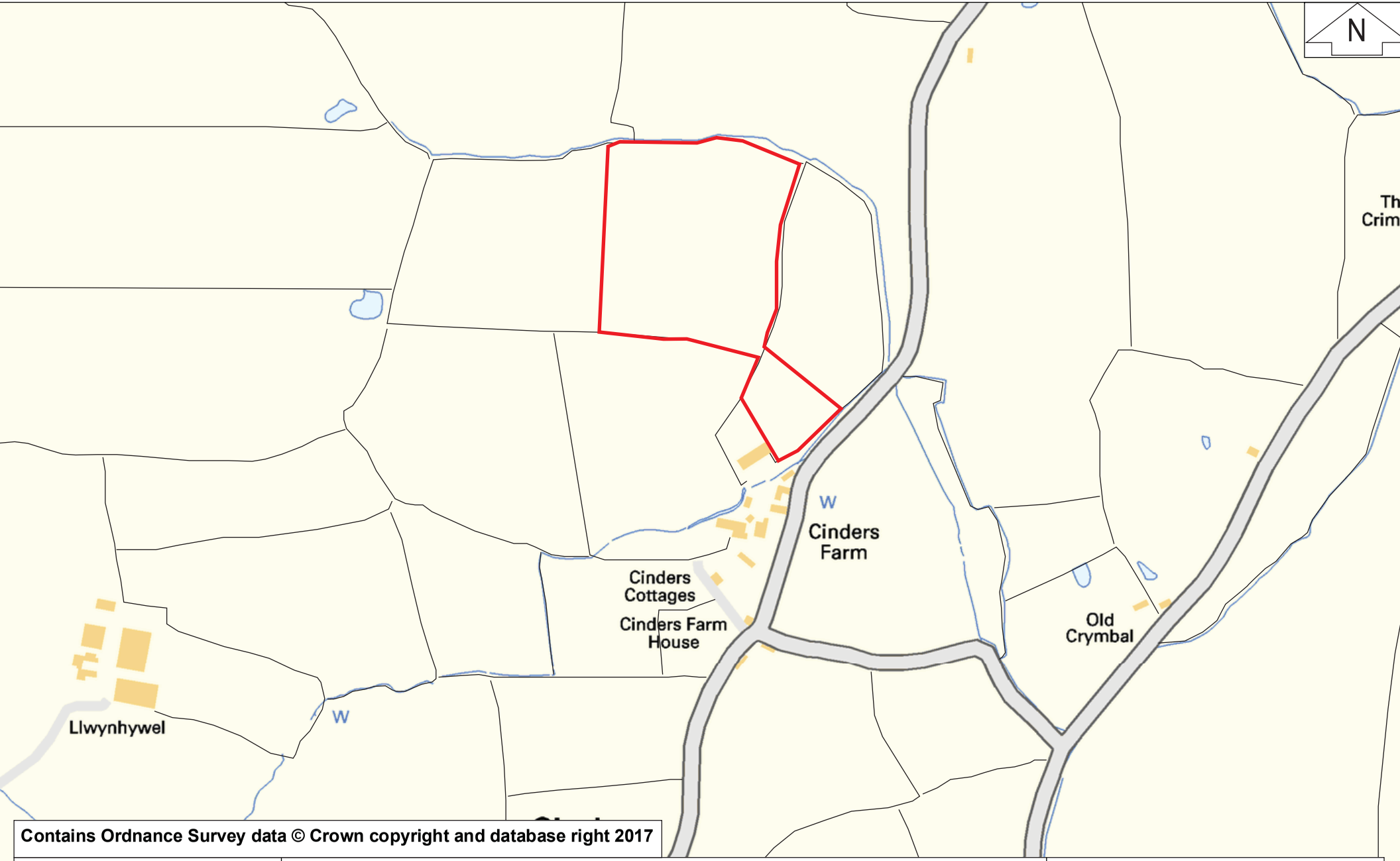


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Figure 01: Location of proposed development site at Cinders Farm, Ruabon.
Scale 1:20,000 at A4.

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Figure 02: Location of proposed development site at Cinders Farm, Ruabon.
Scale 1:5,000 at A4.

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3.0 METHODS AND TECHNIQUES

3.1 Archival research

The archaeological assessment involved the study of the following records:

- The regional Historic Environment Record (Clwyd-Powys Archaeological Trust, 41 Broad Street, Welshpool, SY21 7RR) was examined for information concerning the study area. This included an examination of the core HER, and secondary information held within the record which included unpublished reports, the 1:2500 County Series Ordnance Survey maps, and the National Archaeological Record index cards and aerial photography.

- The National Monuments Record (NMR RCAHMW, National Monuments Record of Wales, Plas Crug, Aberystwyth, SY23 1NJ) was checked for sites additional to the HER.

- Information about Listed Buildings and Scheduled Ancient Monuments from Cadw were examined in the regional HER in order to provide information pertaining to the historical development of the Site. The Register of Outstanding and Special Historic Landscapes and the Register of Parks and Gardens was checked, and also the location of World Heritage Sites.

- The regional archives (Wrexham Archives and Local Studies Service) were visited to examine primary and secondary sources related to the assessment area, including estate maps, tithe maps, Ordnance Survey maps, land tax assessments, rental agreements, and any information stored within the archives collection relating to the site.

- Secondary sources were examined, including the Inventories of the Royal Commission on Ancient and Historical Monuments for Wales, and works held within the regional libraries and archives.

- Results from previous archaeological work within the area was also reviewed.

3.2 Site walkover

The site walkover was carried out on 15th December 2017 by Richard Cooke BA MA MCIfA, archaeological contractor and consultant at Aeon Archaeology. The weather conditions were satisfactory for the field search being generally overcast with sunny spells. All archaeological sites and viewpoints were photographed using a digital SLR (Canon 600D) set to maximum resolution (72 dpi). Where the indirect non-physical (visual) impact of the Proposal upon archaeological receptors has been assessed the digital SLR camera was set to a 35mm lens in order to simulate actual viewpoints.

3.3 Assessment report

All features identified from the archival research and site walkover were assessed and allocated to categories of international, national, regional/county, local and none/unknown importance as listed in section 6.0. These are intended to place the archaeological feature within a geographical context of importance and thus help inform the most suitable level of mitigatory response. The criteria used for allocating features to categories of importance are based on existing statutory designations and, for non-designated assets, the Secretary of

State's non-statutory criteria for Scheduling Ancient Monuments; these are set out in Planning Policy Wales TAN24, and the Historic Environment Act (Wales) 2016.

3.4 Project archive

A full archive including plans, photographs and written material was prepared. All plans, photographs and written descriptions were labelled and cross-referenced using Aeon Archaeology pro-formas. A draft copy of the report was sent to the Client and upon written approval from them paper and digital copies of the report will be sent to the regional HER (Clwyd-Powys Archaeological Trust, 41 Broad Street, Welshpool, SY21 7RR), the CPAT Development Control Archaeologist, and the RCAHMW. Copies of all notes, plans, and photographs from the assessment are stored at Aeon Archaeology under the project code **A0142.1** with the originals being lodged in a suitable repository to be agreed with the Client and archaeological curator.

4.0 ARCHAEOLOGICAL AND TOPOGRAPHICAL BACKGROUND

4.1 Topographic Description

Ruabon is a town, community and electoral ward in the County Borough of Wrexham in Wales. The town was established between the two great Anglo-Saxon dykes: Offa's Dyke runs approximately 600m to the west, Wat's Dyke less than one kilometre to the east.

The earliest form of the place-name is *Rywnabon* which appeared in 1291, with *Riwuabon* in 1362. The name Ruabon comes from 'Rhiw Fabon' (*Rhiw* being the Welsh word for *hill* and *Fabon* being a mutation from *Mabon*, who it has been suggested was a saint, and that the first church here was dedicated to him (CPAT, Historic Settlement Survey, 2013).

The town is situated 5.7km southwest of Wrexham and 9.2km east of Llangollen. At the 2001 Census, Corwen had a population of 2,400, increasing to 2,925 at the 2011 census (www.wrexhm.gov.uk).

The site is circa 4.8 hectares of gently sloping arable land located to the northwest of Cinders Farm which comprises a complex of modern and traditional agricultural buildings with original farm workers cottages. The site is located two kilometres to the east of Ruabon and is rural in character. The Site is bounded by predominantly arable and pastoral farmland.

The site is allocated as open countryside in the local plan.

The site is located within an area of low surface water flood risk. The site is not located within a conservation area nor are there listed buildings within the immediate vicinity.

The bedrock geology is of the Halesowen Formation, a mudstone, siltstone and sandstone sedimentary bedrock that formed approximately 308 to 310 million years ago in the Carboniferous Period, within a local environment previously dominated by rivers. The superficial deposits are of Devensian sand and gravel, that formed up to 2 million years ago in the Quaternary Period when the local environment was dominated by Ice Age conditions (British Geological Survey).

4.2 Statutory and non-statutory designations

4.2.1 Non-designated monument points from the Clwyd-Powys Historic Environment Record (figure 3)

The Clwyd-Powys Historic Environment Record (HER) maintains a register of non-designated archaeological sites represented as single point data or as polygons. These are identified through their Primary Reference Number (PRN). These include sites which are of archaeological/historical interest, artefact find spots, documentary evidence, and locations of past events such as archaeological projects.

There are 9 non-designated monuments within 1.0km of the Site (see appendix I) however none lie within the Site boundary or within 100.0m.

4.2.2 National Monuments Record (figure 4)

The Royal Commission on the Ancient and Historic Monuments in Wales (RCAHMW) maintains the National Monuments Record (NMR) for Wales. This is a register of non-designated archaeological sites represented as single point data or as polygons. These are identified through their National Primary Reference Number (NPRN) and include sites which are of archaeological/historical interest, artefact find spots, documentary evidence, and locations of past events such as archaeological projects that are not statutorily protected.

There are 6 non-designated monument points within 1.0km of the Site (see appendix I) however none lie within the Site boundary or within 100.0m.

4.2.3 Events

The proposed development site has not been included within any past archaeological assessment or mitigatory events nor has there been any within 1.0km of the Site boundary.

4.2.4 Scheduled Ancient Monuments (figure 5)

Scheduled monuments are those considered to be monuments of national importance. The Ancient Monuments and Archaeological Areas Act 1979 supports a formal system of Scheduled Monument Consent (SMC) for any work to a designated monument. Any works within a Scheduled area will require SMC; this includes non-invasive techniques such as geophysics or field-walking.

There are no Scheduled Ancient Monuments within the Site boundary or within 1.0km of the Site.

4.2.5 Historic Landscape Character Areas (HLCAs)

Cadw, National Resource Wales (formerly the Countryside Council for Wales), and the International Council of Monuments and Sites (ICOMOS UK) compiled the two volume Register of Landscapes of Historic Interest in Wales. This includes 58 landscapes of outstanding or special historic interest, which are considered to be the best examples of different types of historic landscapes in Wales. The Register provides information to decision makers and landscape managers, to help ensure that the historic character of the landscape is sustained, and that where change is contemplated, it is well-informed.

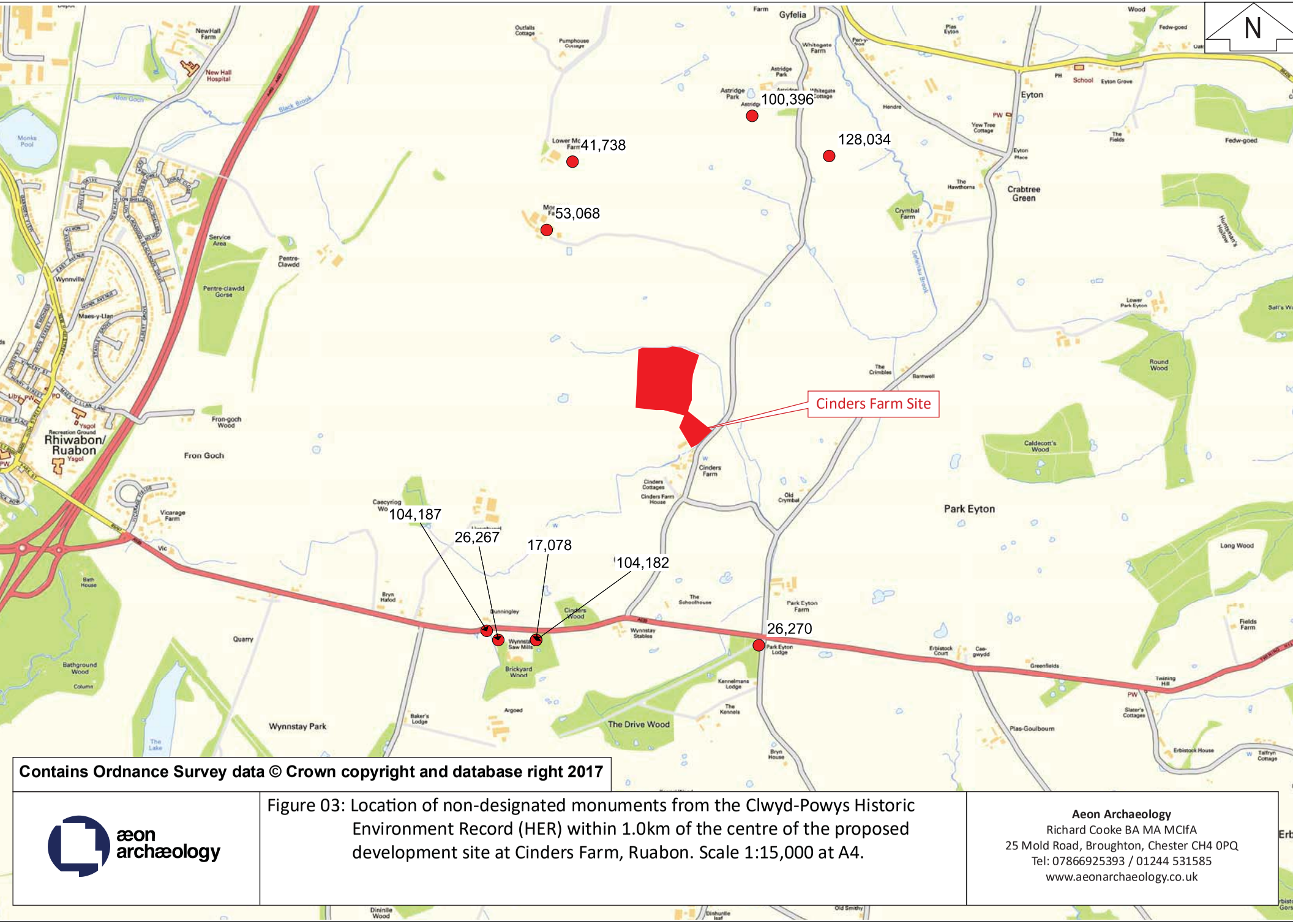
The proposed development site does not lie within a designated historic landscape area.

4.2.6 Aerial Photographs

A range of vertical and oblique aerial photographs were examined for sites additional to those above and from those identified during the site walkover. These included stills dating to 1946 and 1951 taken by the RAF, and 1962 taken by the Ordnance Survey and retained at the RCAHMW (figures 11-13). In addition modern satellite imagery dating to 2006, 2009, 2010, and 2016 were inspected but no additional sites were observed.

4.2.7 LiDAR Data

The LiDAR composite data range retained by Natural Resources Wales was examined for sites additional to those above and from those identified during the site walkover. The data was available for approximately 75% of the Site at 1.0m and 2.0m resolution but no additional sites were observed within the Site boundary or within close proximity.



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Figure 03: Location of non-designated monuments from the Clwyd-Powys Historic Environment Record (HER) within 1.0km of the centre of the proposed development site at Cinders Farm, Ruabon. Scale 1:15,000 at A4.

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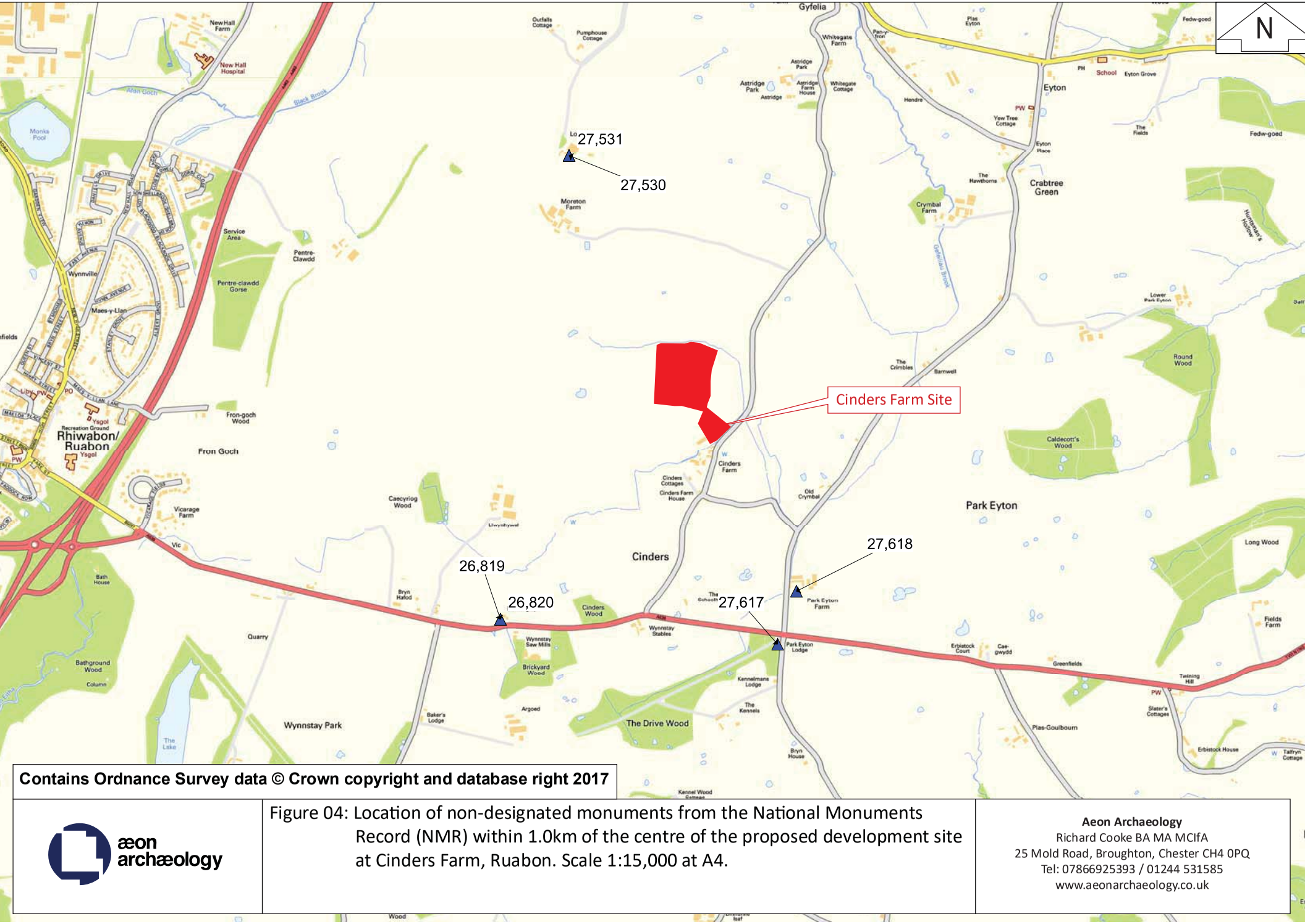


Figure 04: Location of non-designated monuments from the National Monuments Record (NMR) within 1.0km of the centre of the proposed development site at Cinders Farm, Ruabon. Scale 1:15,000 at A4.

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Figure 05: Location of Scheduled Ancient Monuments (SAMs) within 1.5km of the centre of the proposed development site at Cinders Farm, Ruabon. Scale 1:15,000 at A4.

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5.0 THE HISTORICAL CONTEXT

The following sections describe the known archaeological record within the general area of the Site. Sites are identified by their Primary Reference Number (PRN) which is the number by which they are identified in the Clwyd-Powys Historic Environment Record (HER), or by their Scheduled Ancient Monument reference, or there National Primary Reference Number (NPRN) if applicable. The intention of this section is to provide a historical and archaeological context to the site. This aids in establishing the relative importance of an archaeological feature within its landscape, as well as assessing the potential for unknown buried archaeological remains on the proposed development site.

The beginning and end of certain periods is a contentious issue. In the Clwyd-Powys Historic Environment Record (HER) the following dates are used. This is a standard convention across all of the Welsh HERs.

Historic periods

Palaeolithic (prehistoric)	500,000 BC – 10,001 BC
Mesolithic (prehistoric)	10,000 BC – 4,001 BC
Neolithic (prehistoric)	4,000 BC – 2,351 BC
Bronze Age (prehistoric)	2,350 BC – 801 BC
Iron Age (prehistoric)	800 BC – 47 AD
Romano-British	48 AD – 409 AD
Post-Roman (Early Medieval)	410 AD – 1065 AD
Medieval	1066 AD – 1539 AD
Post-Medieval	1540 AD – 1900 AD
Modern	1901 AD – 2050 AD

5.1 Prehistoric and Roman Period

The prehistoric and Roman periods are poorly represented within the localised landscape and there are no known sites within 1.0km of the Site boundary.

The closest evidence for Neolithic activity is the discovery of a stone axe head (PRN: 101232) found in the garden of 71 Heol Offa in 1952 and located approximately 2.7km to the northwest of the Site. Further suspected Neolithic activity has been identified at Bangor-is-y-Coed racecourse through aerial photography where a possible cursus (PRN: 122828) may be located approximately 6.0km to the northeast of the Site.

Bronze Age activity within Ruabon includes the discovery of a burial cist (PRN: 101344) found during sewerage works in 1898, approximately 2.0km west of the Site boundary. A second burial along with a flint arrowhead and possible bronze axe was found at Ruabon Grammar School (PRN: 101199) in 1917 by pupils digging for potatoes. In addition three Bronze Age palstaves have been found within the town (PRNs: 35872, 101343, 101345).

The closest known Iron Age activity to the Site is that of a vague oval cropmark (PRN: 101817) identified through aerial photography as a possible Iron Age or Roman enclosure located approximately 2.4km to the southwest of the Site. Further Iron Age activity can be seen approximately 4.2km to the east where a promontory fort consisting of a double bank and ditch which cut off a level spur overlooks the river Dee.

Further prehistoric activity incudes a crescent shaped bank (PRN: 102881) that may have once formed part of a prehistoric defended enclosure, and located approximately 4.0km to the west of the Site; and two adjacent cropmark enclosures (PRNs: 102657, 102658, and 102659)

identified through aerial photography located approximately 5.0km to the northeast of the Site near to Bangor-is-y-Coed.

Possible Roman occupation activity has been identified from aerial photography approximately 3.3km to the north where cropmarks and linear features may indicate a deserted settlement (PRN: 118990). In addition two Roman brooches (PRNs: 85698 and 85707) and two coins (PRNs: 85744 and 85745) have been found within Ruabon, as well as two coins (PRNs: 120230 and 120231), a spindlewhorl (PRN: 120137), and a brooch (PRN: 120136) at Wood House approximately 3.5km to the north.

The Proposal Site occupies a mildly undulating patch of ground surrounded on the north, east and south sides by a small tributary stream of Gefeiliau Brook. The slightly elevated environs of the Site would most likely have meant that it would have been relatively dry in antiquity and coupled with the fertile hunting grounds of the River Dee floodplain in the east would have been conducive to early habitation.

5.2 Early Medieval, Medieval and Post-Medieval Periods

The early medieval and medieval periods are poorly represented within the immediate landscape and there are no known sites within 1.0km of the Site boundary. Slightly further afield however and located approximately 1.2km and 2.6km respectively to the east of the Site are the early medieval Scheduled Ancient Monuments of Wat's Dyke (De153) and Offa's Dyke (De178).

The scheduled ancient monument of Wat's Dyke is considered to represent a boundary of early medieval origin, separating the Anglo-Saxon kingdoms to the east from the British (Welsh) to the west. Because of its condition the surviving section (extending from Middle Sontley to Black Brook Bridge) to the east of Ruabon has been scheduled by CADW: Welsh Historic Monuments as a monument of national importance (SAM De153).

Offa's Dyke (*Clawdd Offa*) is a large linear earthwork that roughly follows the current border between England and Wales. The structure is named after Offa, the Anglo-Saxon king of Mercia from AD 757 until 796, who is traditionally believed to have ordered its construction. Although its precise original purpose is debated, it delineated the border between Anglian Mercia and the Welsh kingdom of Powys. The scheduled ancient monument of Offa's Dyke (Section South of Aberderfyn Road) consists of the remains of a length of Offa's Dyke extending approximately 80 metres, and forming the boundary of the houses along Wrexham Road. The dyke reaches up to 2.5m metres in height and the ditch has been infilled.

Both of these monuments are of national importance for their potential to enhance the knowledge of early medieval defensive organisation and settlement. They retain significant archaeological potential, with a strong probability of the presence of associated archaeological features and deposits. A dyke may be part of a larger cluster of monuments and their importance can further be enhanced by their group value.

In the medieval period it can be assumed that the earliest settlement at Ruabon might have clustered around the church of St Mary at the top of Bridge Street. Possibly there was a small community here by the 13th century, when the church is mentioned in the Pope Nicholas' Taxation in 1291. The site of the church however is almost certainly much earlier. The near circular churchyard which formerly extended to the west down Ysgoldy Hill suggests that there was an early medieval *llan* church, perhaps preceded by an enclosed cemetery here, before the Norman Conquest.

The economy of the medieval settlement may have integrated ironworking and coal mining

but agriculture and farming generally would have been the primary concern with the utilisation of the lower land to the east. In contrast to more recent centuries, medieval Ruabon is very poorly documented, and it is not yet possible to define the extent or nature of the medieval village here. However, the presence of *Maes-y-llan* immediately to the east of the village points to medieval open-field agriculture which in this region would almost certainly be associated with a nucleated settlement (CPAT, Historic Settlement Survey, 2013).

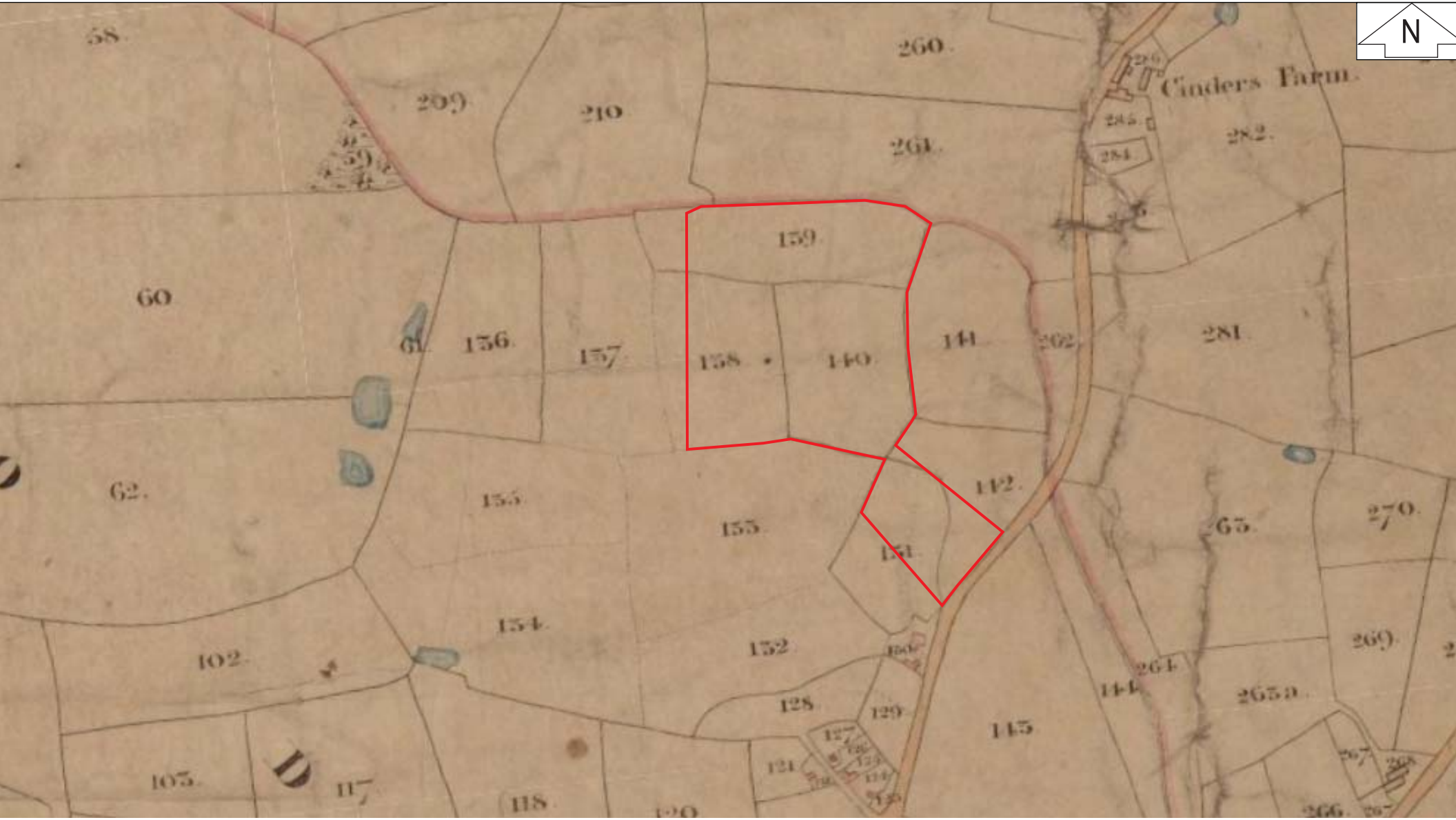
The Proposal Site is first shown in detail on the Ruabon tithe map of 1845 (figure 6) where the Site is shown as occupying parts of five enclosed fields. The unnamed road is shown bordering the eastern edge of the site and at the current location of Cinders Farm a small building, most likely a cottage, is depicted. Further to the north along the unnamed road a farmstead labelled as 'Cinders Farm' is shown suggesting that the original farm was relocated to its current position.

Tithe apportionment for the 1845 tithe map of Ruabon

Plot	Landowner	Occupier	Field Name	Field Use
131	Ellis Eaton	Richard Birch	Part of Cae Tervin	Arable
138	Ellis Eaton	Richard Birch	Part of Cae Tervin	Pasture
139	Ellis Eaton	Richard Birch	Part of Cae Tervin	Pasture
140	Ellis Eaton	Richard Birch	Part of Cae Tervin	Arable
142	Ellis Eaton	Richard Birch	Part of Cae Tervin	Pasture

All of the field plot names given within the tithe apportionment for the Site form part of a larger field plot area known as *Cae Tervin* and does not allude to any landuse additional to that of agriculture.

The proposed development site is shown in detail on the first, second, third, and fourth edition 6" Ordnance Survey County Series maps of 1879, 1900, 1914 and 1938 respectively (figures 7-10). All four maps depict the Site as occupying parts of four enclosed field plots; plots 131 and 142 shown on the tithe map having been amalgamated into one field sometime between 1845 and 1879. There are no features of note depicted on any of the maps however sometime after the production of the 25" Ordnance Survey map of 1956 the northernmost three fields at the Site are amalgamated into one large enclosed field.



æon archæology	Figure 06: Location of the proposed development site at Cinders Farm, Ruabon on the Ruabon tithe map of 1845.	**Aeon Archaeology** Richard Cooke BA MA MCIfA 25 Mold Road, Broughton, Chester CH4 0PQ Tel: 07866925393 / 01244 531585 www.aeonarchaeology.co.uk



Figure 07: Location of the proposed development site at Cinders Farm, Ruabon on the First Edition 6" County Series Ordnance Survey map of 1879.

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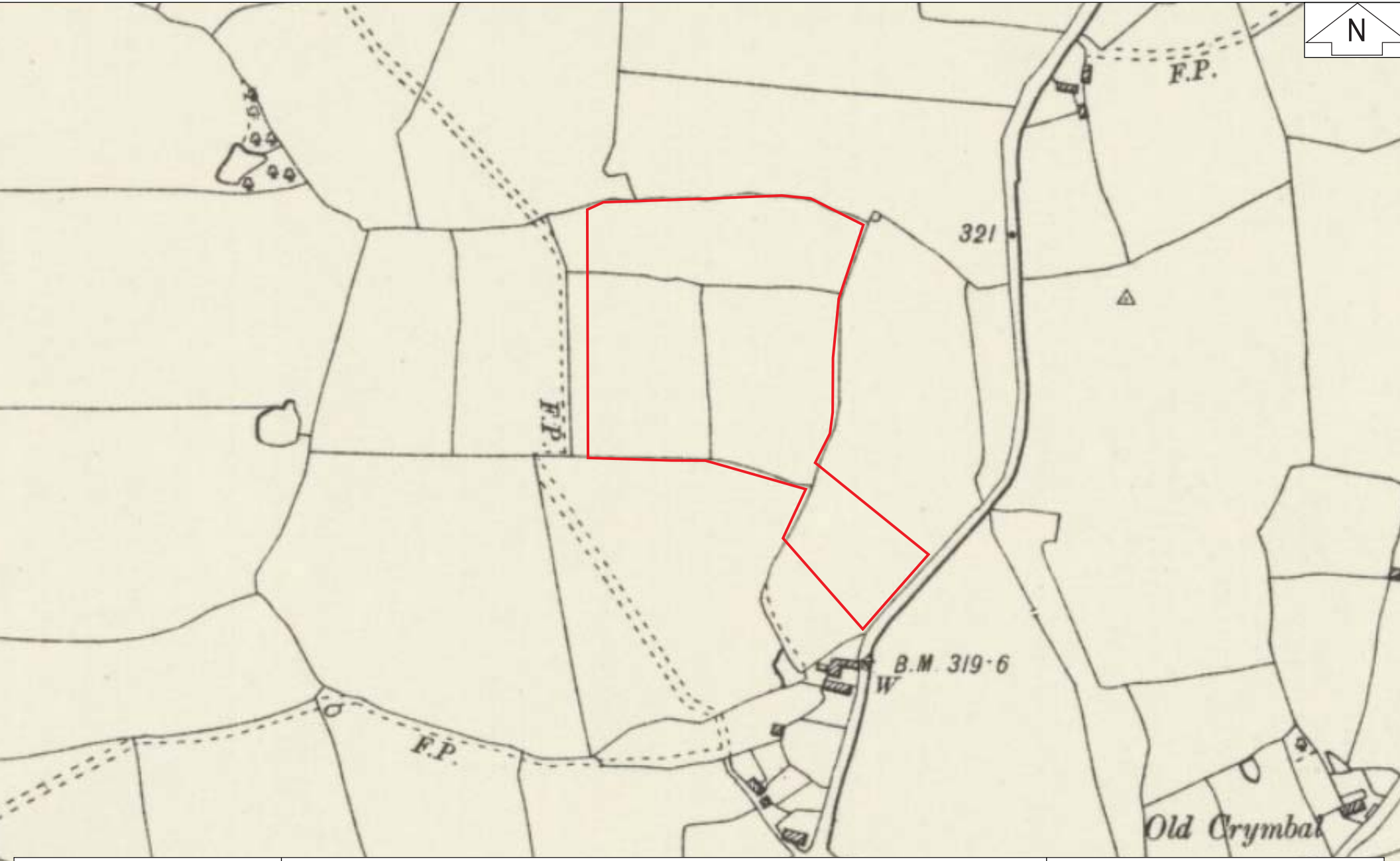


Figure 08: Location of the proposed development site at Cinders Farm, Ruabon on the Second Edition 6" County Series Ordnance Survey map of 1900.

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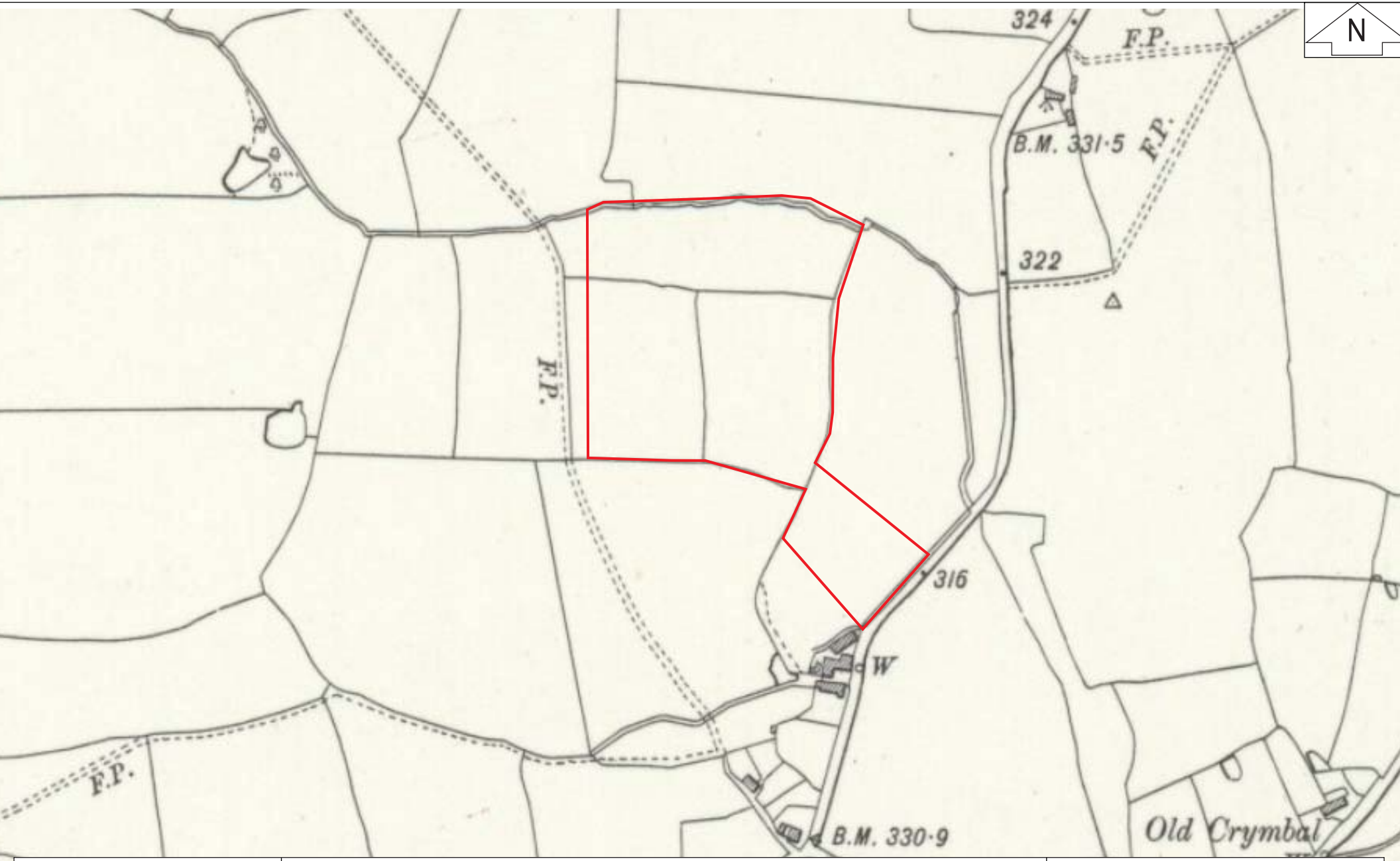


Figure 09: Location of the proposed development site at Cinders Farm, Ruabon on the Third Edition 6" County Series Ordnance Survey map of 1914.

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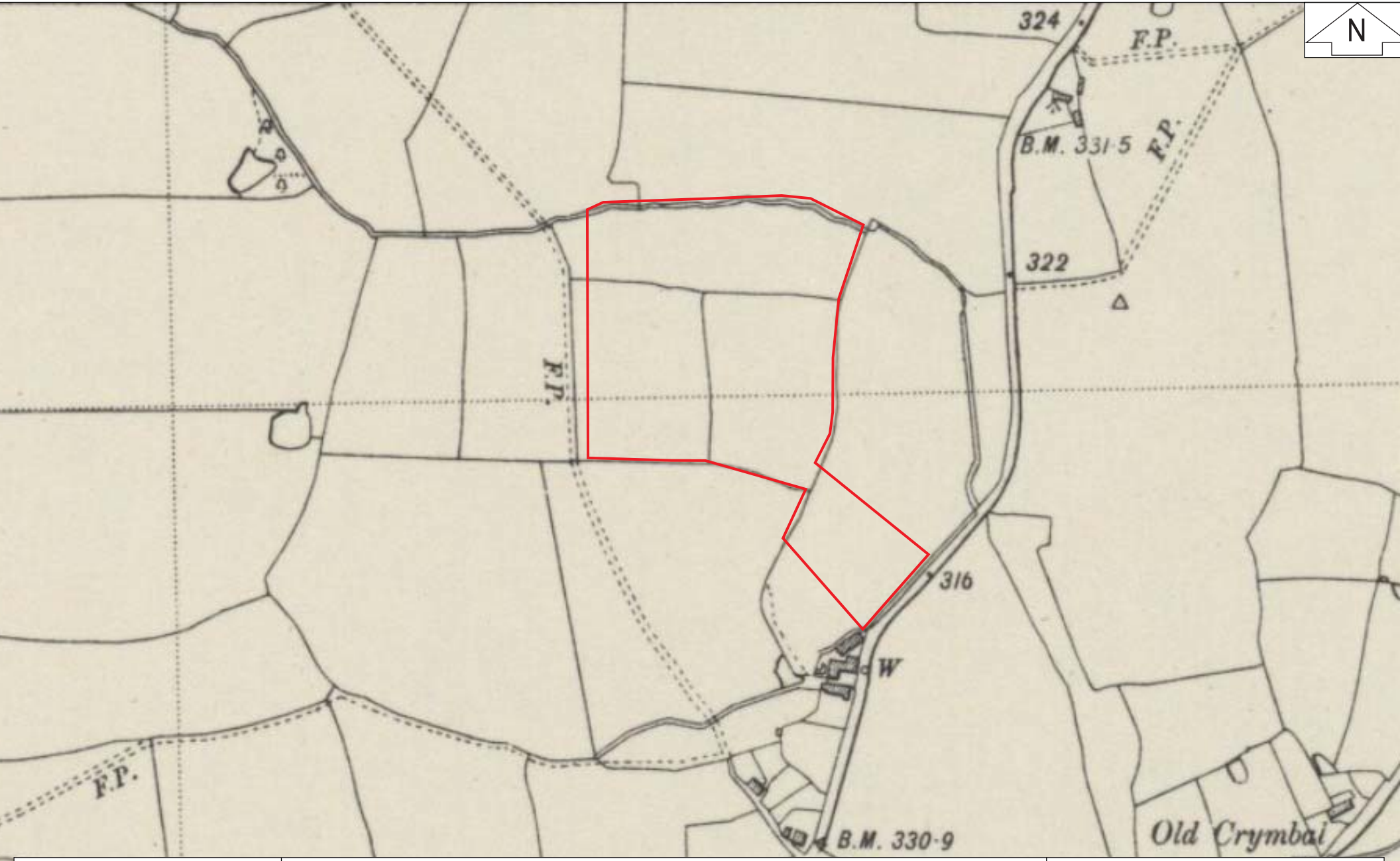


Figure 10: Location of the proposed development site at Cinders Farm, Ruabon on the Fourth Edition 6" County Series Ordnance Survey map of 1938.

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Figure 11: Location of the proposed development site at Cinders Farm, Ruabon on the RAF aerial photograph of 1946 (106GUK_1454_4364).

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Figure 12: Location of the proposed development site at Cinders Farm, Ruabon on the RAF aerial photograph of 1951 (540_494_3204).

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Figure 13: Location of the proposed development site at Cinders Farm, Ruabon on the OS aerial photograph of 1962 (621258_5171_F22 0069).

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6.0 ASSESSMENT OF HISTORICAL ASSETS

6.1 Definitions

Definitions of importance, impact, and significance of effect as used in the gazetteer (section 6.2) are listed below.

1. Definition of Categories of importance

The following categories were used to define the importance of the archaeological resource.

Significance	Description
International (Very High)	Archaeological sites or monuments of international importance, including World Heritage Sites. Structures and buildings inscribed as of universal importance as World Heritage Sites. Other buildings or structures of recognised international importance.
National (High)	Ancient monuments scheduled under the Ancient Monuments and Archaeological Areas Act 1979, or archaeological sites and remains of comparable quality, assessed with reference to the Secretary of State's non-statutory criteria. Listed Buildings. Undesignated structures of national importance.
Regional/ County (Medium)	Conservation Areas Archaeological sites and remains which, while not of national importance, score well against most of the Secretary of State's criteria.
Local (Low)	Archaeological sites that score less well against the Secretary of State's criteria. Historic buildings on a 'local list'.
Negligible/None	Areas in which investigative techniques have produced no or only minimal evidence for archaeological remains, or where previous large-scale disturbance or removal of deposits can be demonstrated.
Unknown	Archaeological sites whose importance cannot be determined with the information currently at hand. This can include sites where the extent of buried remains is unknown.

2. Definition of Impact

The direct impact of the proposed development on each site was estimated. The impact is defined as follows:

Magnitude	Direct Impacts	Indirect Impacts
High Adverse	Complete removal of an archaeological site. Complete destruction of a designated building or structure.	Radical transformation of the setting of an archaeological monument. A fundamental change in the setting of a building.
Medium Adverse	Removal of a major part of an archaeological site and loss of research potential. Extensive alteration (but not demolition) of a historic building or feature, resulting in an appreciable adverse change.	Partial transformation of the setting of an archaeological site (e.g. the introduction of significant noise or vibration levels to an archaeological monument leading to changes to amenity use, accessibility or appreciation of an archaeological site). Partial adverse transformation of the setting of a designated building.
Low Adverse	Removal of an archaeological site where a minor part of its total area is removed but the site retains a significant future research potential. Change to a historic building or feature resulting in a small change in the resource and its historical context and setting.	Minor change to the setting of an archaeological monument or historic building.
Negligible/ Neutral	No impact from changes in use, amenity or access. No change in the ability to understand and appreciate the resource and its historical context and setting.	No perceptible change in the setting of a building or feature.
Low Beneficial	Land use change resulting in improved conditions for the protection of archaeological remains or understanding/ appreciation of a historic building or place	Decrease in visual or noise intrusion on the setting of a building, archaeological site or monument. Improvement of the wider landscape setting of a building, archaeological site or monument.
Medium Beneficial	Land use change resulting in improved conditions for the protection of archaeological remains, or understanding/ appreciation of a historic building or place, including through interpretation measures (heritage trails, etc). Removal of harmful alterations to better reveal the significance of a building or structure, with no loss of significant fabric.	Significant reduction or removal of visual or noise intrusion on the setting of a building, archaeological site or monument; and Improvement of the wider landscape setting of a building, archaeological site or monument Improvement of the cultural heritage amenity, access or use of a building, archaeological site or monument.
High Beneficial	Arrest of physical damage or decay to a building or structure;	Exceptional enhancement of a building or archaeological site, its cultural heritage amenity and access or use

3. The significance of effect

The significance of effect is derived from the importance of the resource and the magnitude of the impact upon it.

Very large - A serious impact on a site of international or national importance with little or no scope for mitigation. These effects represent key factors in the decision making process.
Large - Lesser impacts on sites of national importance and serious impacts on sites of regional importance, with some scope for mitigation. These factors should be seen as being very important considerations in the decision making process.
Moderate - Moderate or minor impacts on sites of regional importance and minor to major impacts on sites of local or minor importance. A range of mitigatory measures should be available.
Slight - Negligible impacts on sites of regional, local or minor importance and minor and moderate impacts on minor or damaged sites. A range of basic mitigatory measures should be available.
Neutral - No perceptible effect or change to sites of all categories.
The significance of effect will be determined using the table below, a basic matrix combining archaeological value and magnitude of impact.

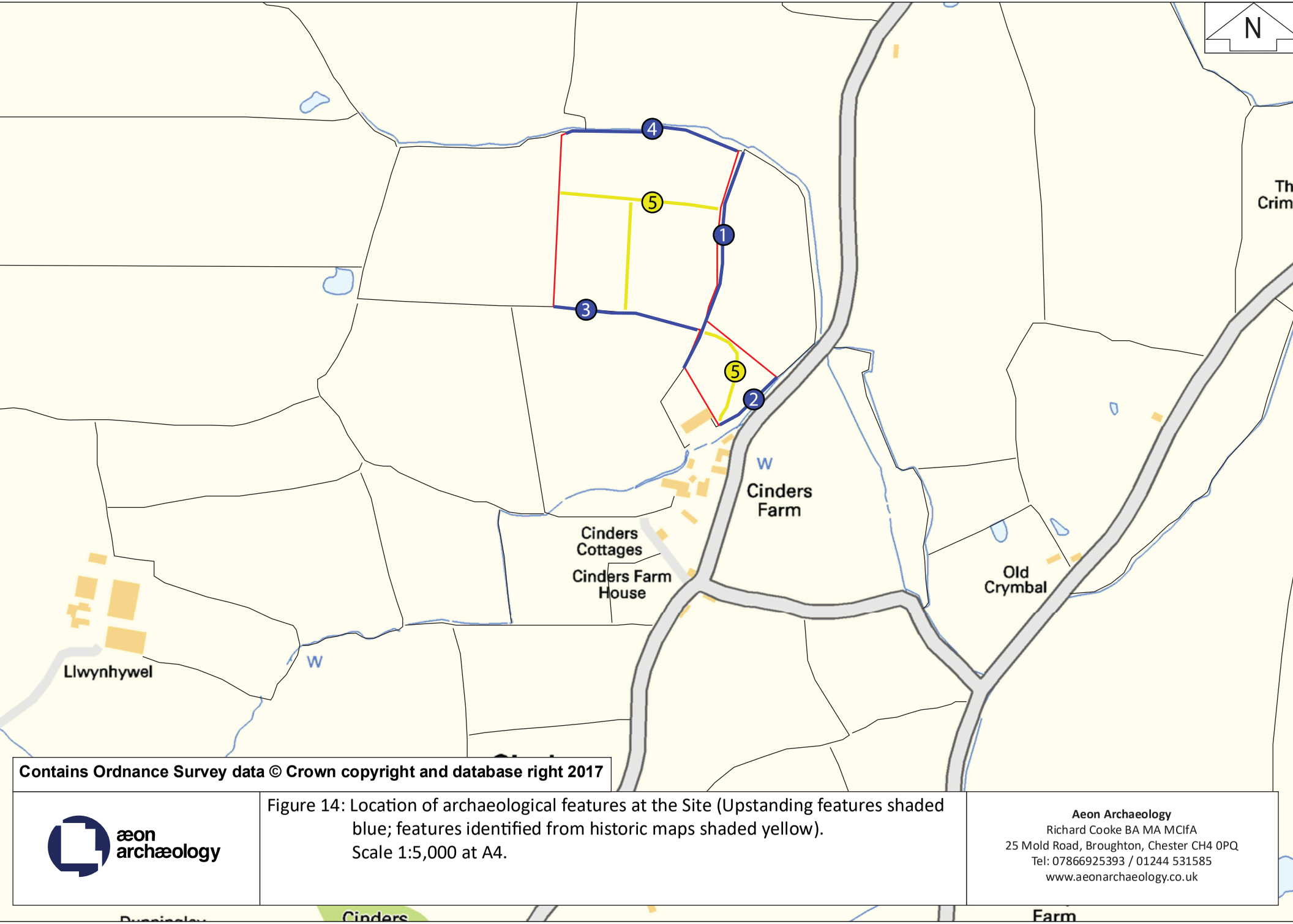
Determination of Significance of Effect

Archaeological Value	**International**	Neutral	Moderate or Large	Large or Very Large	Very Large
	National	Neutral	Moderate or Slight	Moderate or Large	Large or Very Large
	Regional	Neutral	Slight	Moderate	Moderate or Large
	Local	Neutral	Neutral or Slight	Slight	Moderate or Slight
	Negligible	Neutral	Neutral or Slight	Neutral or Slight	Slight
		None	**Low**	**Medium**	**High**
		Magnitude of impact			

7.0 SITE GAZETTEER

The field walkover and archival search identified 4 sites of archaeological and historic interest within the Site boundary and a further 1 site was identified from historical maps, as listed below.

In accordance with Planning Policy Wales TAN24 and Historic Environment Act (Wales) 2015 each heritage asset has been assigned a level of importance ranked from International through to National, Regional/County, Local, and None. If it is not possible to assess the importance of the site from the visible remains, then it is ranked Unknown with the suspected importance level placed in brackets if possible. Identified sites were also assigned a level of impact ranked from High through to Medium, and Low. Levels of impact can be considered as both adverse or beneficial, and can be direct (physically impacting upon a site) or indirect (indirectly physically impacting upon a site). The significance of effect is determined from the importance level of the resource and the magnitude of the impact upon it. Where it is expected that a site will be impacted upon by the proposed works then mitigation/assessment recommendations are provided. All archaeological/historical sites identified are depicted on figure 14 and the location and orientation of photographs are shown on figure 15.



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Figure 14: Location of archaeological features at the Site (Upstanding features shaded blue; features identified from historic maps shaded yellow).
Scale 1:5,000 at A4.

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1. **Field boundary**	**PRN:** Tbc
Figure: 6-10, 14	**Plate:** 1
NGR: SJ 32487 43940	**Period:** Post-medieval
Description A hedgerow field boundary runs from north to south and borders the north-eastern limit of the Site. It measures approximately 1.4m in height and is made up mostly of hawthorn with the occasional mature tree. The field boundary is depicted on the 1845 tithe map and although the actual age of the hedge is unknown, under The Hedgerow Regulations 1997 a hedgerow is considered "important" if it is greater than 30 years old and is recorded in a document held at the relevant date at a Record Office as an integral part of a field system pre-dating the Enclosure Acts. The hedgerow will be breached by the proposed access road but will otherwise be retained and as such it is expected that there will be a neutral/slight adverse significance of effect. The hedgerow will require a basic descriptive and photographic record to be taken of it prior to partial removal, however the record presented here should be seen as being commensurate with a basic record level and as such no further assessment or mitigatory measures are proposed.	
Category of importance: Local	
Level of impact: Negligible adverse direct physical (construction)	
Significance of effect: Neutral/slight adverse	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: Basic record - complete	



Plate 01: Field boundary - feature 1, from the east. Scale 1.0m.

2. Field boundary	**PRN:** Tbc
Figure: 6-10, 14	**Plate:** 2
NGR: SJ 32520 43838	**Period:** Post-medieval
Description A wooden post and wire fence field boundary runs from northeast to southwest and borders the eastern limit of the Site. It measures approximately 1.0m in height and is accompanied by a field drainage ditch separating the boundary from the unnamed road. The field boundary is depicted on the 1845 tithe map and although the actual age of the hedge is unknown. The boundary will be breached by the proposed access road but will otherwise be retained and as such it is expected that there will be a neutral/slight adverse significance of effect. The boundary will require a basic descriptive and photographic record to be taken of it prior to partial removal, however the record presented here should be seen as being commensurate with a basic record level and as such no further assessment or mitigatory measures are proposed.	
Category of importance: Local	
Level of impact: Negligible adverse direct physical (construction)	
Significance of effect: Neutral/slight adverse	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: Basic record - complete	



Plate 02: Field boundary - feature 2, from the northwest. Scale 1.0m.

3. Field boundary	**PRN:** Tbc
Figure: 6-10, 14	**Plate:** 3
NGR: SJ 32383 43958	**Period:** Post-medieval
Description A hedgerow field boundary runs from east to west and borders the southern limit of the Site. It measures approximately 1.5m in height and is made up mostly of hawthorn with the occasional mature tree. The field boundary is depicted on the 1845 tithe map and although the actual age of the hedge is unknown, under The Hedgerow Regulations 1997 a hedgerow is considered "important" if it is greater than 30 years old and is recorded in a document held at the relevant date at a Record Office as an integral part of a field system pre-dating the Enclosure Acts. The hedgerow will not be impacted upon by the Proposal and as such no further assessment or mitigatory measures are proposed.	
Category of importance: Local	
Level of impact: None	
Significance of effect: Neutral	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: None	



Plate 03: Field boundary - feature 3, from the northeast. Scale 1.0m.

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4. Field boundary	**PRN:** Tbc
Figure: 6-10, 14	**Plate:** 4
NGR: SJ 32261 44131	**Period:** Post-medieval
Description A hedgerow field boundary runs from east to west and borders the northern limit of the Site. It measures approximately 1.5m in height and is made up mostly of hawthorn with the occasional mature tree and holly. The field boundary is depicted on the 1845 tithe map and although the actual age of the hedge is unknown, under The Hedgerow Regulations 1997 a hedgerow is considered "important" if it is greater than 30 years old and is recorded in a document held at the relevant date at a Record Office as an integral part of a field system pre-dating the Enclosure Acts. The hedgerow will not be impacted upon by the Proposal and as such no further assessment or mitigatory measures are proposed.	
Category of importance: Local	
Level of impact: None	
Significance of effect: Neutral	
Recommendations for further assessment: None	
Recommendations for further mitigatory measures: None	



Plate 04: Field boundary - feature 4, from the south. Scale 1.0m.

5. Extant field boundaries	**PRN:** Tbc
Figure: 6-10, 14	**Plate:** N.A.
NGR: SJ 32359 44020	**Period:** Post-medieval

Description

Three field boundaries, now extant, are depicted on the tithe map of 1845. The first is located at the south-eastern end of the Site and divided the field plots 131 and 142. This boundary had been removed by the production of the Ordnance Survey map of 1879. The other two boundaries ran east-west and north-south respectively dividing the northern part of the Site into three separate fields. These boundaries were removed sometime after the production of the Ordnance Survey map of 1956.

There are no upstanding remains of the three boundaries but sub-surface remains may persist. As the boundaries have already been removed they are considered to be of negligible value. The Proposal will remove any preserved buried remains resulting in a slight adverse significance of effect. As such no further assessment or mitigatory measures are proposed.

Category of importance: Negligible

Level of impact: High adverse direct physical (construction)

Significance of effect: Slight adverse

Recommendations for further assessment: None

Recommendations for further mitigatory measures: None

6. Wat's Dyke Scheduled Ancient Monument (De155)	**PRN:** Tbc
Figure: 5, 14, 16	**Plate:** 5-10
NGR: SJ 31089 44012 and SJ 31463 44565	**Period:** Early medieval

Description

The Scheduled Ancient Monument of Wat's Dyke lies approximately 1.2km to the west of the Site, however due to the elevated environs of the monument there is a section of approximately 720.0m that has been identified within the Landscape and Visual Impact Assessment by Alan Moss Associates to lie within and area of inter-visibility between the Site and SAM. This impact has been assessed through the use of photographs taken at 35mm to simulate actual viewpoints from the Site looking towards the SAM, from the unnamed road looking across the Site towards the SAM, and from the SAM looking towards the Site.

The Proposal will not impact upon any significant views into, out of, or across the SAM, but will have an impact when viewing eastward across enclosed agricultural fields towards the Site. Due to the relatively large distance involved between the SAM and the Site, coupled with the single-storey form of the Proposal and the existence of the current farm buildings, this indirect non-physical (visual) impact of the Proposal at the Site is considered to be negligible to low adverse, resulting in a slight adverse significance of effect. As such no further assessment or mitigatory measures are proposed aside from contacting Cadw and advising them of the current Proposal.

Category of importance: National

Level of impact: Negligible to low adverse indirect non-physical (visual) (construction and completion)

Significance of effect: Slight adverse

Recommendations for further assessment: None

Recommendations for further mitigatory measures: Contact Cadw regarding Proposal.



Plate 05: View from the western side of the proposed development site towards Wat's Dyke Scheduled Ancient Monument (DE155) (shaded red), from the east.



Plate 06: View from the centre of the proposed development site towards Wat's Dyke Scheduled Ancient Monument (DE155) (shaded red), from the east.



Plate 07: View from the eastern side of the proposed development site towards Wat's Dyke Scheduled Ancient Monument (DE155) (shaded red), from the east.



Plate 08: View from the unamed road to the east of the proposed development site towards Wat's Dyke Scheduled Ancient Monument (DE155) (shaded red), from the east.

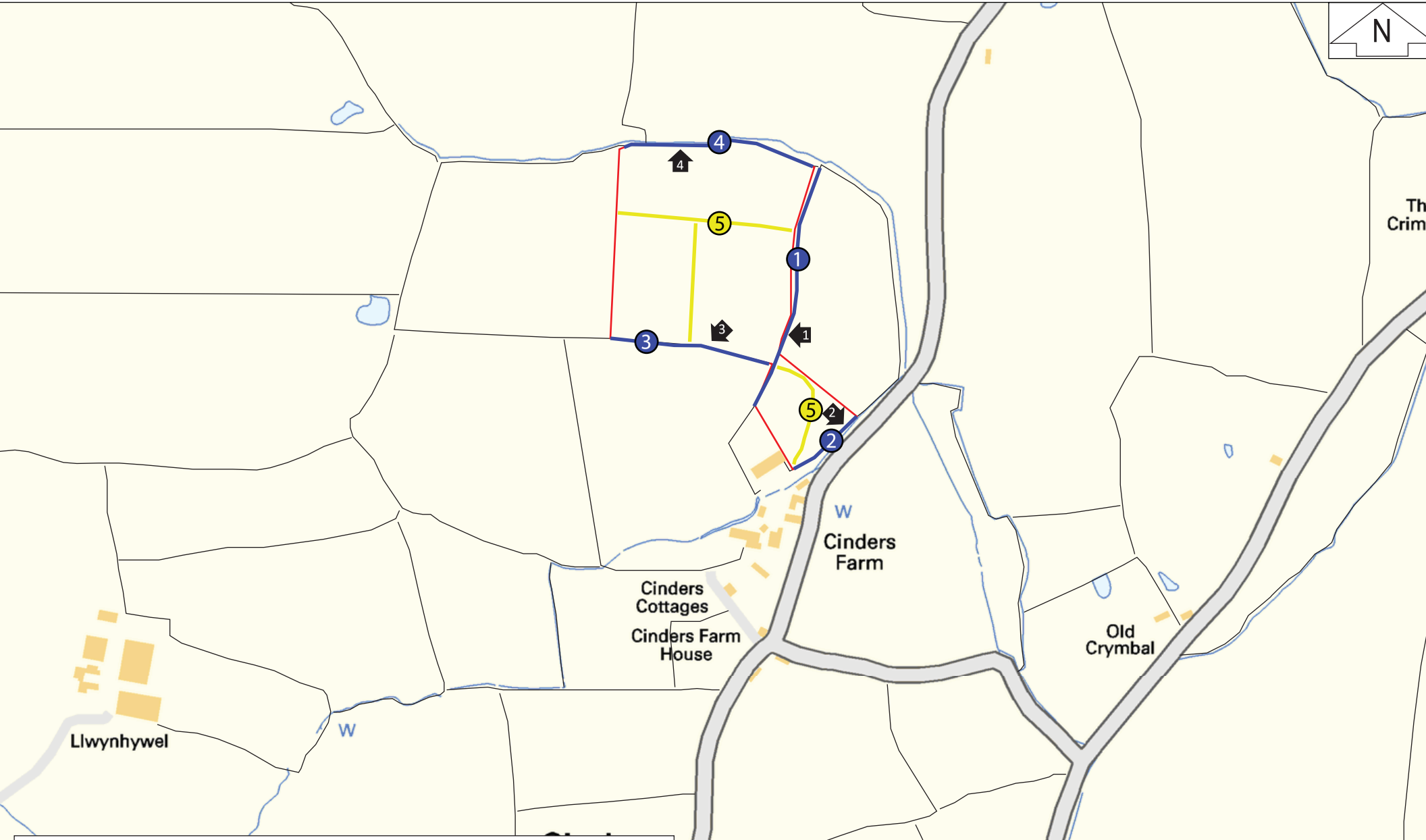


Plate 09: View from Wat's Dyke Scheduled Ancient Monument (DE155) towards the proposed development site (shaded red), from the west.



Plate 10: View from Wat's Dyke Scheduled Ancient Monument (DE155) towards the proposed development site (shaded red), from the west.

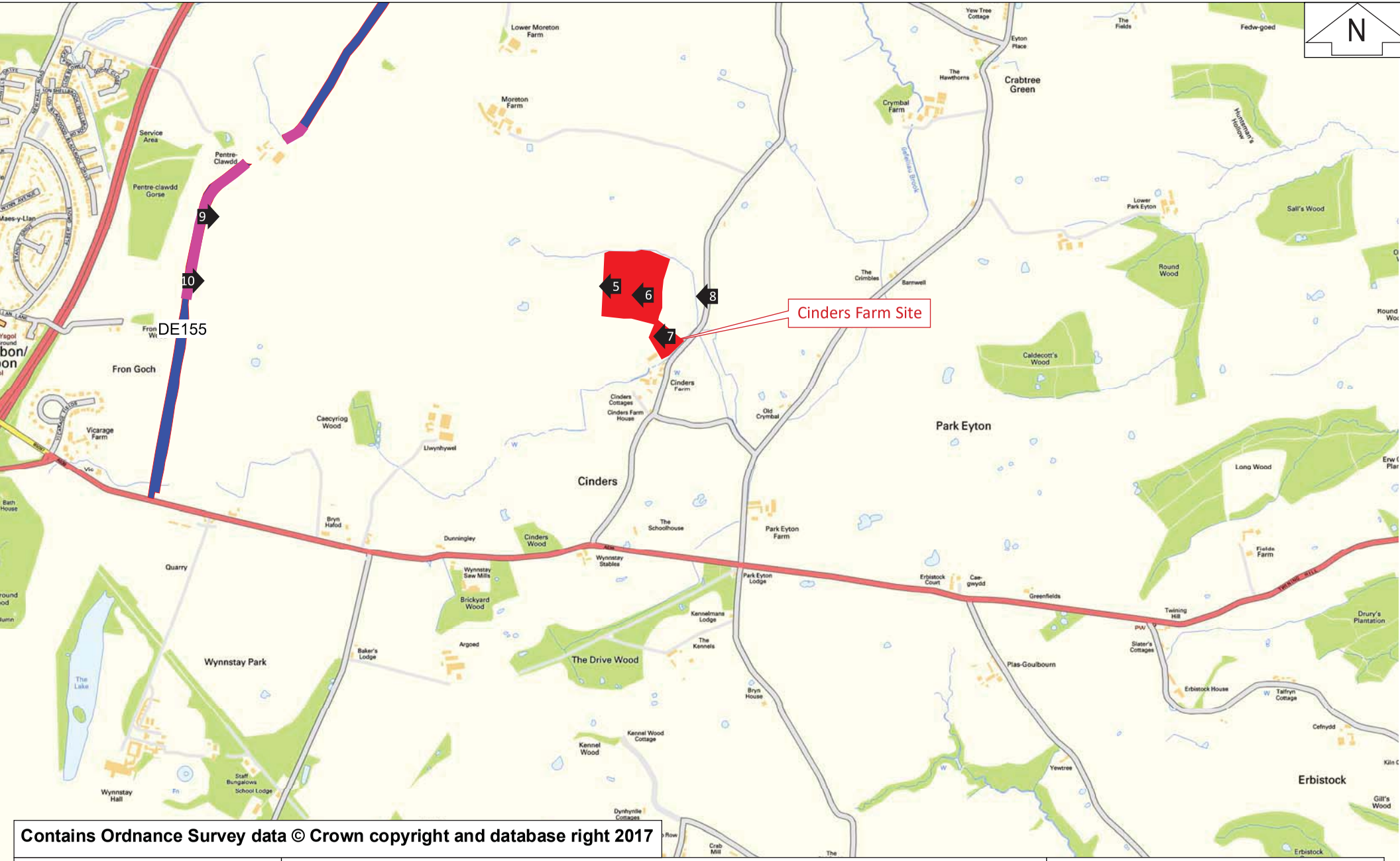
7. Unknown buried archaeological remains	**PRN:** Tbc
Figure: 14	**Plate:** N.A.
NGR: SJ 32359 44020	**Period:** Prehistoric, Roman, early medieval, medieval, post-medieval
Description The available historic maps do not indicate that the Site has ever been occupied; however its geographic environs would have made the Site conducive to habitation in antiquity. The known archaeological resource from all time periods is poorly represented within the immediate environment however occupation sites and find-spots from all periods are known within 5.0km of the Site. Moreover, aside from damage caused by ploughing any preserved archaeological remains at buried level would not have been impacted upon and could survive to a high level. As such it is recommended that a phase of geophysical survey is undertaken at the Site in order to ascertain whether any archaeological remains persist at a buried level.	
Category of importance: Uknown	
Level of impact: Unknown	
Significance of effect: Unknown	
Recommendations for further assessment: Geophysical survey	
Recommendations for further mitigatory measures: Dependent upon the results of the geophysical survey.	



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Figure 15: Location of plates 1-4. Scale 1:5,000 at A4.

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Figure 16: Length of Wat's Dyke SAM where the Proposal Site is visible when viewing east across enclosed fields (shaded pink) and location of plates 5-10. Scale 1:15,000 at A4.

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	Summary of archaeological features.			**GREEN = no action required; RED= Action required**		
Number	**Name**	**Importance**	**Impact**	**Significance of effect**	**Further Assessment**	**Mitigation Recommendations**
PHYSICAL DIRECT AND INDIRECT IMPACTS						
1	Field boundary	Local	Negligible adverse direct physical (construction)	Neutral /Slight adverse	None	Basic record - complete
2	Field boundary	Local	Negligible adverse direct physical (construction)	Neutral /Slight adverse	None	Basic record - complete
3	Field boundary	Local	None	Neutral	None	None
4	Field boundary	Local	None	Neutral	None	None
5	Extant Field Boundaries	Negligible	High adverse direct physical (construction)	Slight adverse	None	None
6	Wat's Dyke SAM (De155)	National	Negligible to low adverse indirect non-physical (visual) (construction and completion)	Slight adverse	None	Contact Cadw regarding Proposal.
7	Unknown buried archaeological remains	Unknown	Unknown	Unknown	Geophysical survey	Dependent upon the results of the geophysical survey.

8.0 IMPACT AND RECOMMENDATIONS

8.1 Direct physical impact

Construction phase

The Proposal is expected to have a *negligible adverse direct physical* impact upon two field boundaries (features 1 and 2) during the construction phase resulting in a *neutral / slight adverse* significance of effect. In addition it is expected that there will be a *high adverse direct physical* impact upon three extant field boundaries (feature 5) during the construction phase. These are all considered to be of *negligible* importance resulting in a *slight adverse* significance of effect.

Completion phase

The Proposal is not expected to have any direct physical impact upon any known sites of archaeological and historical significance upon completion.

8.2 Indirect physical and non-physical (visual) impact

Construction phase

The Proposal is expected to have a *negligible to low adverse indirect non-physical (visual)* impact upon the Scheduled Ancient Monument of Wat's Dyke (De155) when viewing eastward from the SAM towards the Site during the construction phase, resulting in a *slight adverse* significance of effect.

Completion phase

The Proposal is expected to have a *negligible to low adverse indirect non-physical (visual)* impact upon the Scheduled Ancient Monument of Wat's Dyke (De155) when viewing eastward from the SAM towards the Site during the completion phase, resulting in a *slight adverse* significance of effect.

8.3 Site Specific Recommendations

Site specific recommendations have been made for a geophysical survey of the Site in order to ascertain the potential for buried archaeological remains to persist at sub-surface level. The results of this survey will inform the requirement, if any, for further assessment or mitigatory measures.

It has also been recommended that Cadw be consulted on the Proposal and potential impact upon the Scheduled Ancient Monument of Wat's Dyke (De155).

9.0 SOURCES

OS Maps

1st edition 6 inch Ordnance Survey Map of 1879.

2nd edition 6 inch Ordnance Survey Map of 1900.

3rd edition 6 inch Ordnance Survey Map of 1914

4th edition 6 inch Ordnance Survey Map of 1938.

25" edition Ordnance Survey Map of 1956.

OS 1:10 000 Series sheet SJ 34NE, SJ 34SE, SJ 34SW, and SJ 34NW.

Aerial Photographs

RAF Aerial Photographs

1946 (106GUK_1454_4364)

1951 (540_494_3204)

OS Aerial Photographs

1962 (621258_5171_F22 0069)

2006, 2009, 2010, 2016 Google mapping

Sources

British Geological Survey website. www.bgs.ac.uk.

Chisholm, H. 1911. *Encyclopaedia Britannica*

Clwyd-Powys Historic Environment Record (HER)

Clwyd-Powys Historic Settlement Survey, 2013

Dodd, C. R. 1844. *The Peerage, Baronetage, and Knightage of Great Britain and Ireland*

English Heritage, 1991. *Management of Archaeological Projects (MAP2)*

English Heritage, 2006. *Management of Research Projects in the Historic Environment (MORPHE)*

English Heritage, 2011. *The Settings of Heritage Assets*

NMR Site Record Cards

RCAHMW - coflein

Ruabon Tithe Map and Apportionment of 1845.

The Chartered Institute for Archaeologists, 2014 *Standard and Guidance for Archaeological Desk-Based Assessment*

APPENDIX 1: SCHEDULED AND NON-SCHEDULED SITES WITHIN 1.0KM

Undesignated monuments within 1.0km of the Site as listed on the Clwyd-Powys HER (figure 3)

PRN	Name	Type	Broadclass	Period
17078	Wynnstay brick and tile works	Brickworks	Industrial	Post-Medieval
26267	Wynnstay park, brickyard cottage	House	Domestic	Post-Medieval
26270	Wynnstay hall, park eyton lodge	Lodge	Domestic	Post-Medieval
41738	Moreton below farmhouse (also known as lower moreton farm), moreton	Farmhouse	Domestic	Post-Medieval
53068	Moreton farm	Farmstead		Post-Medieval
100396	Astridge farm enclosure	Enclosure	Monument (by form)	Unknown
104182	Brickyard wood brickworks	Brickworks	Industrial	Post-Medieval
104187	Brickyard wood milestone	Milestone	Transport	Post-Medieval
128034	Ty-coch enclosure	Enclosure	Agriculture and subsistence	Post-Medieval

NMR Monument Points within 1.0km of the Site (figure 4)

NPRN	Name	Broadclass	Type	Period
26819	Brickyard cottage, ruabon	Domestic	House	Post Medieval
26820	Brickyard cottage	Domestic	House	Post Medieval
27530	Moreton below	Domestic	House	Post Medieval
27531	Moreton below	Domestic	House	Post Medieval
27617	Park Eyton Lodge, Wynnstay Park, Ruabon	Domestic	Lodge	Post Medieval
27618	Park Eyton farm, Ruabon	Gardens, Parks and Urban Spaces	Place name	

Appendix 8.2

Appendix

Table 8.4 Factors for Assessing the Value of Heritage Assets (based on DMRB, Vol. 11 Environmental Assessment, Section 3, Part 2, HA 208/7, Cultural Heritage)

Value	Equivalence
Very High	World Heritage Sites (including nominated sites). Archaeological sites or buildings or historic areas of acknowledged international importance Historic landscapes of international value, whether designated or not. Extremely well preserved historic landscapes with exceptional coherence, time-depth, or other critical factor(s).
High	Scheduled Ancient Monuments Undesignated archaeological assets of designatable quality and importance. Grade I and Grade II* Listed Buildings Other listed buildings that can be shown to have exceptional qualities in their fabric or historical associations not adequately reflected in the listing grade Conservation Areas containing very important buildings Undesignated structures of clear national importance Grade I and Grade II* Registered Parks and Gardens Undesignated historic landscapes of outstanding interest high quality and importance, and of demonstrable national value exhibiting considerable coherence, time-depth or other critical factor(s)
Medium	Archaeological remains of regional/county importance. Grade II Listed Buildings Historic (unlisted) buildings that can be shown to have exceptional qualities in their fabric or historical associations. Conservation Areas containing buildings that contribute significantly to its historic character. Grade II Registered Parks and Gardens Undesignated historic landscape character areas of regional interest averagely well-preserved with reasonable coherence, time-depth or other critical factor(s) Important hedgerows Historic townscape or built-up areas with important historic integrity in their buildings, or built settings (e.g. including street furniture and other structures).
Low	Archaeological remains of district/local importance and/or those sites compromised by poor preservation and/or poor survival of contextual associations Undesignated historic landscapes of local relevance Undesignated parks and gardens of local relevance Historic landscapes the value of which is limited by poor preservation and/or poor survival of contextual associations and hedgerows Locally Listed' buildings Historic (unlisted) buildings of modest quality in their fabric or historical association. Historic Townscape or built-up areas of limited historic integrity in their buildings, or built settings (e.g. including street furniture and other structures). Robust undesignated historic landscapes with importance to local interest groups.

	Undesignated historic landscapes whose value is limited by poor preservation and/or poor survival of contextual associations.
Negligible	Assets which have been damaged or destroyed to the extent that they have very little or no surviving archaeological interest or assets of no historic/architectural note. Landscapes of little or no historic interest. Buildings of no architectural or historical note; buildings of an intrusive character.
Unknown	Assets for which insufficient information is available to identify importance or assets with little or no significant historic, architectural, archaeological or artistic interest

8.52 A direct impact is a physical effect on an asset arising at the same time as and occurring as a consequence of physical changes to the asset. For example, groundworks associated with construction directly disturbing archaeological remains. With respect to assets the pathway of a direct impact usually leads to a predictable outcome – a greater or lesser physical impact which is detrimental to the preservation and survival of a part or whole of an asset. However, the impact pathway is nevertheless significant because pathways lend themselves to varying approaches to mitigation such as elimination, prevention, control, compensation and offsetting (see below). With respect to assets impacts can also be indirect, in that the setting of an asset, within or beyond the boundaries of a proposed development can be affected by the proposed development. In addition impacts are considered beneficial or adverse; reversible or irreversible; short, medium or long term; and temporary or permanent.

8.53 For the purposes of assessing direct impacts to assets the pre-eminent characteristic of the impact is the scale to which the impact alters the asset. This can be gauged by cross-referencing the potential impact activities with each known asset. In addition, the type of impact is judged in order to arrive at a magnitude. The scale ranges from negligible, through minor and moderate to major and the type of impact can be beneficial or adverse. A matrix can be completed which provides a rating based upon the scale and type of impact and extent or components of the assets affected. The magnitude of impact to individual assets is a matter of professional judgment and is based on a five-fold scale (major, moderate, minor, negligible and no change) based on the Design Manual for Roads and Bridges. The range of impact magnitude is explained in Table 8.4.

Table 8.5: Factors in the Assessment of Magnitude of Impact to Archaeological Remains (based on DMRB, Vol. 11 Environmental Assessment, Section 3, Part 2, HA 208/7, Cultural Heritage)

Impact Magnitude	Description
Major Adverse	Total loss of asset
Major Beneficial	Comprehensive improvement to the asset through restoration or enhancement,
Moderate Adverse	Partial loss of or detrimental modification to the asset, but integrity of majority of asset remains
Moderate Beneficial	Improvement to asset condition/preservation through enhancement or protection,
Minor Adverse	Some measurable depreciation to the attributes and quality of asset
Minor Beneficial	Some measurable improvement to the attributes and quality of asset
Negligible Adverse	Very slight loss or detrimental alteration to asset
Negligible Beneficial	Very slight benefit to condition/preservation of asset
No change	No loss or alteration of asset, no discernible impact either adverse or beneficial

8.54 The significance of the effect on assets is a combination of the importance of the assets and the magnitude of the impact. The significance of the effect is expressed using a nine-fold scale (Very Large, Large/Very Large, Moderate/Large, Moderate, Moderate/Slight, Slight/Moderate, Slight, Neutral/Slight and Neutral) based on the Design Manual for Roads and Bridges. The required combination for identified remains has been undertaken with the aid of a matrix, as shown in Table 8.6, in order to assist judgements regarding importance and impact magnitude in order that a reasonable and balanced assessment of effect significance (either beneficial or adverse) can be reached.

Table 8.6: Effect Significance Matrix for Assets (based on DMRB, Vol. 11 Environmental Assessment, Section 3, Part 2, HA 208/7, Cultural Heritage)

IMPORTANCE OF ASSET						
	Very High	Neutral	Slight	Moderate/Large	Large/Very Large	Very Large
	High	Neutral	Slight	Moderate/Slight	Moderate/ Large	Large/Very Large
	Medium	Neutral	Slight/ Neutral	Slight	Moderate	Moderate/ Large
	Low	Neutral	Neutral/ Slight	Slight/Neutral	Slight	Slight/ Moderate
	Negligible	Neutral	Neutral	Neutral/Slight	Slight/Neutral	Slight
	Unknown	Neutral	Neutral	Neutral/Slight	Slight/Moderate	Moderate/ Large
		No change	Negligible	Minor	Moderate	Major
		MAGNITUDE OF IMPACT TO ASSET				

Assumptions/Limitations

8.55 The assessment has been undertaken in the knowledge of the uncertainties that arise when trying to assess impacts on a resource that is not wholly known and is often poorly understood.

8.56 It should be noted that the assessment is based in large part on information held in source repositories and published data, augmented by a walk-over survey. The source repositories and published data do not represent exhaustive sources of information on the presence/absence of assets. With the exception of the walk-over survey there has been no project specific fieldwork undertaken on the site. However, from the data available it is possible to quantify and qualify the known assets and to determine the potential for as yet unknown assets to be present. These factors have been taken into consideration during this assessment. This information has in turn been considered against the pre-existing impacts to the site which may have compromised the survival of any assets on the site.

8.57 In order that reliable conclusions can be drawn from the categorisation of the impacts and effects, the data used to establish the nature of the impact has been reviewed with respect to the following criteria:

- Confidence - how reliable is the data from a scientific and statistical perspective?
- Assumptions - were any assumptions made in identifying potential impacts and if so what were they?
- Limitations - what are the limitations of the data that could have an influence on the confidence and the description of the nature of the impacts?

8.58 A number of assumptions have, however, been made as to the fact of and degree to which any archaeological remains may survive on the site. The precautionary principle has been adopted and it is assumed that there are some archaeological and cultural heritage assets on the site.

8.59 There is no meaningful limitation on the assessment of impacts represented by the Proposal as the impacts are derived from consideration of a Proposal involving orthodox and previously used design and construction techniques.

Appendix 9.1

Table 9.2: Landscape Quality Criteria	
High	Landscapes with strong or distinctive character, in very good condition. No incongruous features. Best examples of a particular landscape type.
Medium/High	Landscapes with moderately strong character; in good condition; well intact; with few incongruous features. Good examples of a particular landscape type.
Medium	Landscapes with moderate strength of character. Whilst retaining many of the key characteristics of the landscape type it may have suffered from some decline and may feature occasional incongruous features.
Low/Medium	Landscapes with weak strength of character, often fragmented, and/or featuring significant atypical, incongruous, or discordant features.
Low	Landscapes with poorly defined character or few remaining characteristics typical of the type. Degraded landscapes or major incongruous features.

Table 9.3: Landscape Value Criteria	
National Level	Landscape areas recognised at a national level eg. World Heritage Sites, National Parks, AONBs, Grade I & II* Registered Parks & Gardens, Registered Battlefields.
County/District Level	Landscape areas recognised at a county/district level eg. county/district level designated landscapes & historic parkland.
Parish/Community Level	Landscape areas of more than just local value eg. recognised landmarks & beauty spots, village greens & common land.
Local Level	Most other landscape areas are of value at a local level either as a local recreational resource or by providing a pleasant visual outlook.
Negligible or Negative	Some landscape areas may have little or even negative value. eg derelict or degraded landscapes and eyesores.

Table 9.4: Landscape Susceptibility Criteria	
High	Landscape areas which taking into account the nature of the change anticipated and the potential for mitigation are vulnerable to relatively small changes.
Medium/High	Landscape areas which taking into account the nature of the change anticipated and the potential for mitigation can accommodate some change, subject to sensible siting and design.
Medium	Landscape areas which taking into account the nature of the change anticipated and the potential for mitigation can reasonably accommodate moderate change, subject to sensible siting and design.
Low/Medium	Landscape areas which taking into account the nature of the change anticipated and the potential for mitigation can accommodate larger scale change, subject to sensible siting and design.
Low	Landscape areas which taking into account the nature of the change anticipated and the potential for mitigation can accommodate substantial change, subject to sensible siting and design.

Table 9.5: Landscape Character Susceptibility Factors			
Factor	**Indicators of lower susceptibility (Increased chance that development can be accommodated in the landscape)**	**Indicators of moderate susceptibility**	**Indicators of higher susceptibility (Reduced chance that development can be accommodated in the landscape)**
Landform (also related to visual factors such as elevation and viewing angle)	Absence of strong topographical variety. Featureless, convex or flat.	Moderate topographical variety.	Presence of strong topographical variety or distinctive landform features.
Landscape pattern and complexity	Simple, regular or uniform.	Sub-regular.	Complex, rugged and irregular.
Settlement and man-made influence	Presence of contemporary development; strong relationship to existing settlement pattern.	Some contemporary development; moderate relationship to existing settlement pattern.	Absence of modern development, presence of small scale, historic or vernacular settlement; poor relationship to existing settlement pattern.
Inter-visibility with adjacent landscapes	Little inter-visibility with adjacent sensitive landscapes or viewpoints.	Moderate inter-visibility with sensitive landscapes or viewpoints.	Strong inter-visibility with sensitive landscapes. Forms an important part of a view from sensitive viewpoints.
Perceptual aspects (sense of remoteness, tranquillity)	Close to visible signs of human activity and development.	Moderate signs of human activity and development.	Physically or perceptually remote, peaceful or tranquil.
Existing mitigating features or potential for new mitigation	Presence of existing mitigating features (eg. woodlands and hedgerows).	Some existing mitigating features. Opportunities for new planting.	Absence of mitigating features (eg open moorland).
Proximity of sensitive landscape features	Absence of sensitive features	Presence of more distant sensitive features (eg. designated heritage assets)	Presence of closer sensitive features (eg. designated heritage assets)
Adapted from Natural England Technical Information Note TIN101 (September 2011)			

Table 9.6: Susceptibility of Night-Time Landscape to New Lighting	
High	Night-time landscape which is truly dark, and is vulnerable to relatively small scale or low levels of lighting intrusion eg. remote rural locations.
Medium/High	Between medium and high.
Medium	Night-time landscape which has relatively low levels of existing illumination, but is capable of accommodating some new lighting, subject to sensitive design eg countryside near to rural settlements.
Low/Medium	Between low and medium.
Low	Night-time landscape which has relatively high levels of existing illumination, and is capable of accommodating more substantial change, subject to sensitive design eg. countryside on edge of main towns or conurbations.

Table 9.7: Criteria for Scale of Effect on Landscape Character (adverse or beneficial)	
High	A major change in landscape characteristics such as the introduction or removal of a dominant large scale development and/or a substantial loss of characteristic landscape features, whilst taking account the effectiveness of any landscape mitigation measures.
Medium/High	A notable change in landscape characteristics such as the introduction or removal of a prominent development and/or a notable loss of characteristic landscape features, whilst taking account the effectiveness of any landscape mitigation measures.
Medium	A moderate change in landscape characteristics such as the introduction or removal of a readily noticeable development and/or a moderate loss of characteristic landscape features, whilst taking account the effectiveness of any landscape mitigation measures.
Low/Medium	A minor change in landscape characteristics such as the introduction or removal of a less noticeable development and/or a minor loss of characteristic landscape features, whilst taking account the effectiveness of any landscape mitigation measures.
Low	A slight change in landscape characteristics and/or a slight loss of characteristic landscape features, whilst taking account the effectiveness of any landscape mitigation measures.

Table 9.8: Criteria for Geographical Extent of Landscape Effect	
High	Change on a scale influencing landscape character over an extensive area such as several entire landscape types or character areas.
Medium/High	Change on a scale influencing landscape character over a broad area such as the entire landscape type or character area within which the proposal lies.
Medium	Change on a scale influencing landscape character within the local area.
Low/Medium	Change on a scale influencing landscape character within the immediate setting of the site.
Low	Change on a scale influencing landscape character within the development site itself.

Table 9.9: Criteria for Duration and Reversibility of Landscape Effects	
Long Term	Permanent landscape effects likely to last for over 20 years.
Medium/Long Term	Permanent landscape effects capable of reasonable mitigation within 15 to 20 years.
Medium Term	Permanent landscape effects capable of reasonable mitigation within 10 to 15 years.
Short/Medium Term	Permanent landscape effects capable of reasonable mitigation within 5-10 years.
Short Term	Permanent landscape effects capable of reasonable mitigation within 5 years.
Temporary	Developments seeking temporary planning permission after which the land will be reinstated.
Seasonal	Some developments may be of a seasonal nature.
Intermittent	Some developments may be of an intermittent nature.

Table 9.10: Definitions of Landscape Significance Terminology (adverse or beneficial)	
Degree of Significance	**Definition**
Severe (Significant)	Landscape effects that represent key factors in the decision-making process. They are generally, but not exclusively associated with sites and features of national importance and resources/features which are unique and which, if lost, cannot be replaced or relocated.
Major (Significant)	Landscape effects that are likely to be important considerations at a regional/district scale and, if adverse, are potential concerns to the project, depending upon the relative importance attached to the issue during the decision making process.
Moderate (Not Significant)	Landscape effects that while important at a local scale, are not likely to be key decision making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource.
Minor (Not Significant)	Landscape effects that may be raised as local issues but are unlikely to be of importance in the decision making process. Nevertheless, they are of relevance in the detailed design of the project.
Negligible (Not Significant)	Landscape effects that are so slight that there is no need to take them into consideration in the design or mitigation of the development.
Adapted from Environmental Impact Assessment: A Guide to Good Practice and Procedures Consultation Paper (DCLG 2006)	

Table 9.12: Visual Amenity Value Criteria	
National Level	Views of national importance eg. iconic views of nationally important structures, designed views in Grade I & II* Registered Parks & Gardens or views from scenic routes and scenic viewpoints in landscapes of national importance.
County/District Level	Views of county/district importance eg. views from scenic routes and scenic viewpoints in landscapes of county/district importance.
Community/Parish/Level	Views of more than just local value eg. views from recognised or well used local landmarks & beauty spots.
Local Level	Most other landscape views are of value at a local level providing a pleasant visual outlook to residents, visitors and travellers.
Negligible or Negative	Some views may have little or even negative value. eg views of derelict or degraded landscapes and eyesores.

Table 9.13: Visual Receptor Susceptibility Criteria	
High	People engaged in strategic level recreational activities where landscape views are likely to be the prime focus of their attention eg: Visitors to scenic viewpoints Users of strategically promoted footpath routes Visitors to heritage attractions or to other attractions where views of the surroundings are an important contributor to the experience.
Medium/High	People engaged in local level activities where landscape views might be important but not necessarily the prime focus of their attention eg: Users of other public rights of way Occupiers of residential properties in open countryside Residents at home occupying principal daytime rooms. Motorists on rural scenic routes
Medium	People engaged in activities where landscape views provide a backdrop to their main activity eg: Motorists on minor rural roads Users of other open space/outdoor recreational facilities Occupiers of residential properties on existing farmsteads Occupiers of residential properties on edge of urban areas Residents at home occupying non-principal daytime rooms.
Low/Medium	People engaged in activities who might only get a fleeting glance or occasional view of a particular landscape eg: Users of public rights of way in urban areas Low usage or inaccessible public rights of way Motorists on rural A & B roads and motorways Users of railways Occupiers of residential properties in urban areas
Low	People engaged in activities whose attention is unlikely to be focused on the landscape eg: Motorists on urban roads People at their place of work

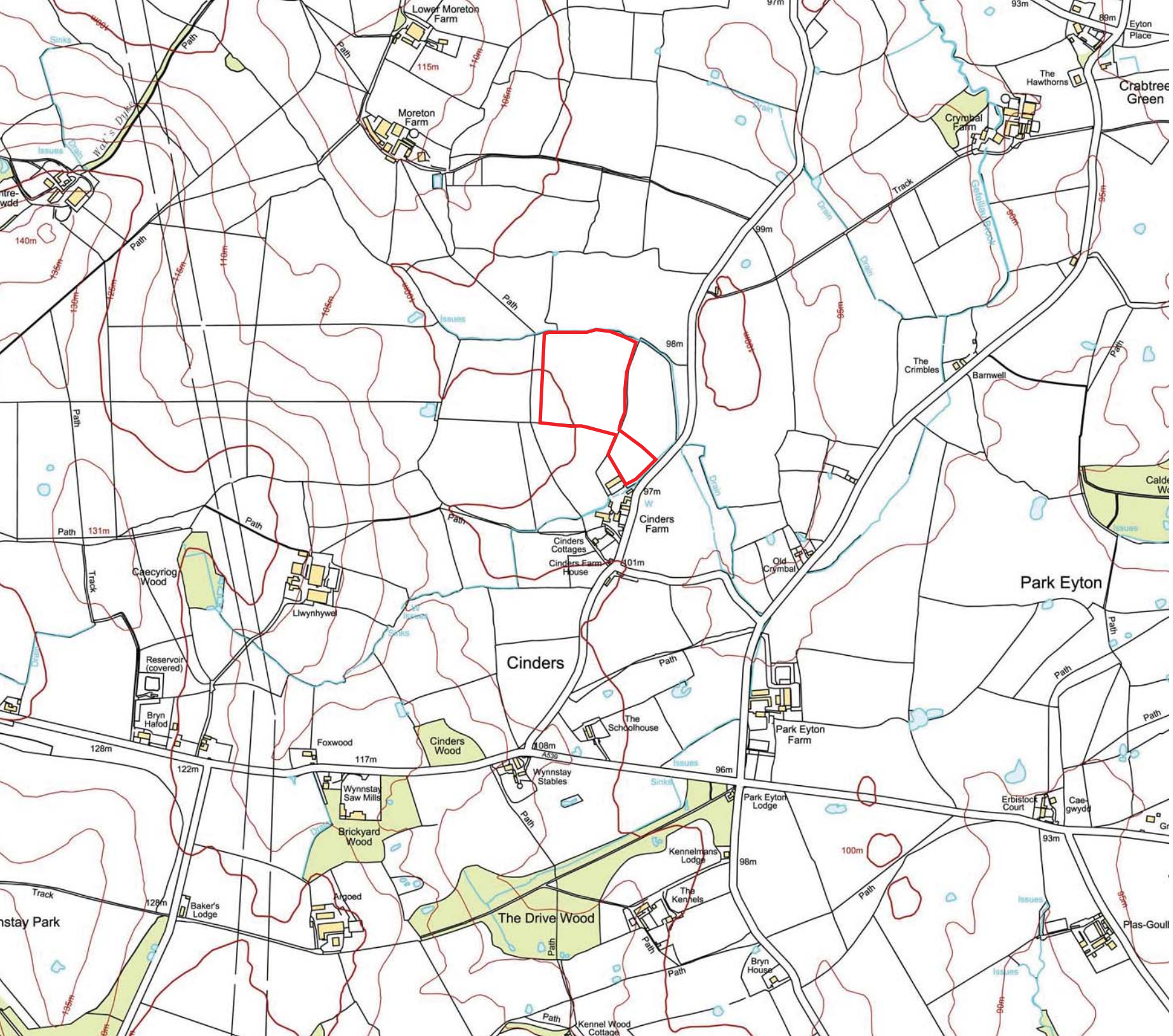
Table 9.15: Criteria for Scale of Visual Effects (adverse or beneficial)	
High	Substantial change in view where proposed development would be a dominant feature: commanding, controlling the view, foremost feature, prevailing, overriding.
Medium/High	Notable change in view where proposed development would be prominent: standing out, striking, sharp, unmistakable, easily seen.
Medium	Moderate change in view where proposed development would be conspicuous: noticeable, distinct, catching the eye or attention, clearly visible, well defined.
Low/Medium	Minor change in view where proposed development would be apparent: visible, evident, obvious, perceptible, discernable, recognisable.
Low	Slight change in view where proposed development would be inconspicuous: lacking sharpness of definition, not obvious, indistinct, not clear, obscure, blurred, indefinite, subtle.
Adapted from Guidance on the Assessment of the Impact of Offshore Windfarms: Seascape & Visual Impact Report. DTI (2005).	

Table 9.16: Criteria for Geographical Extent of Visual Effects	
High	Visual change over a wide area at the receptor location. (eg. over 2.5km length)
Medium/High	Between medium and high. (eg. 1250-2500m length)
Medium	Visual change over a moderate area at the receptor location. (eg. 500-1250m length)
Low/Medium	Between low and medium. (eg. 100-500m length)
Low	Visual change over a small area at the receptor location. (eg. less than 100m length)

Table 9.17: Criteria for Duration and Reversibility of Visual Effects	
Long Term	Permanent visual effects unlikely to be capable of reasonable mitigation within 20 years.
Medium/Long Term	Permanent visual effects capable of reasonable mitigation within 15 to 20 years.
Medium Term	Permanent visual effects capable of reasonable mitigation within 10 to 15 years.
Short/Medium Term	Permanent visual effects capable of reasonable mitigation within 5 to 10 years.
Short Term	Permanent visual effects capable of reasonable mitigation within 5 years.
Temporary	Temporary visual effects after which the view will be reinstated.
Seasonal	Seasonal visual effects.
Intermittent	Intermittent visual effects.

Table 9.18: Definitions of Visual Amenity Significance Terminology (adverse or beneficial)	
Degree of Significance	**Definition**
Severe (Significant)	Visual effects that represent key factors in the decision-making process. They are generally, but not exclusively associated with sites and features of national importance and resources/features which are unique and which, if lost, cannot be replaced or relocated.
Major (Significant)	Visual effects that are likely to be important considerations at a regional/district scale and, if adverse, are potential concerns to the project, depending upon the relative importance attached to the issue during the decision making process.
Moderate (Not Significant)	Visual effects that while important at a local scale, are not likely to be key decision making issues. Nevertheless, the cumulative effect of such issues may lead to an increase in the overall effects on a particular area or on a particular resource.
Minor (Not Significant)	Visual effects that may be raised as local issues but are unlikely to be of importance in the decision making process. Nevertheless, they are of relevance in the detailed design of the project.
Negligible (Not Significant)	Visual effects that are so slight that there is no need to take them into consideration in the design or mitigation of the development.
Adapted from Environmental Impact Assessment: A Guide to Good Practice and Procedures Consultation Paper (DCLG 2006)	

Appendix 9.2



Job: **Proposed**
Cinders F
Ruabon, W

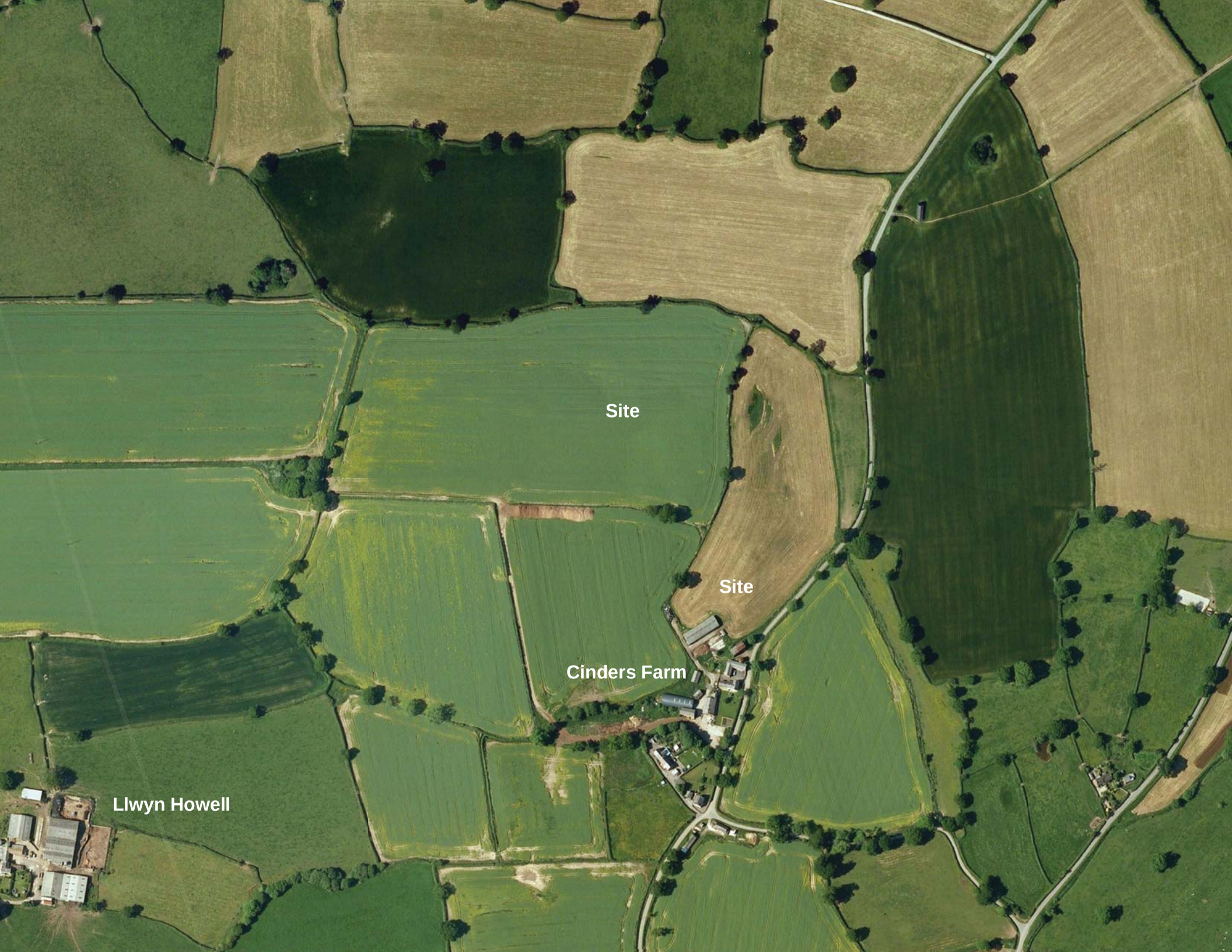
Title: **Location**

Scale: **1:10,000**

Drawing No: **148**

Appendix 9.3


Site
Site


Site
Site
Cinders Farm
Llwyn Howell

Appendix 9.4



-west corner of site on Footpath RUA/91.



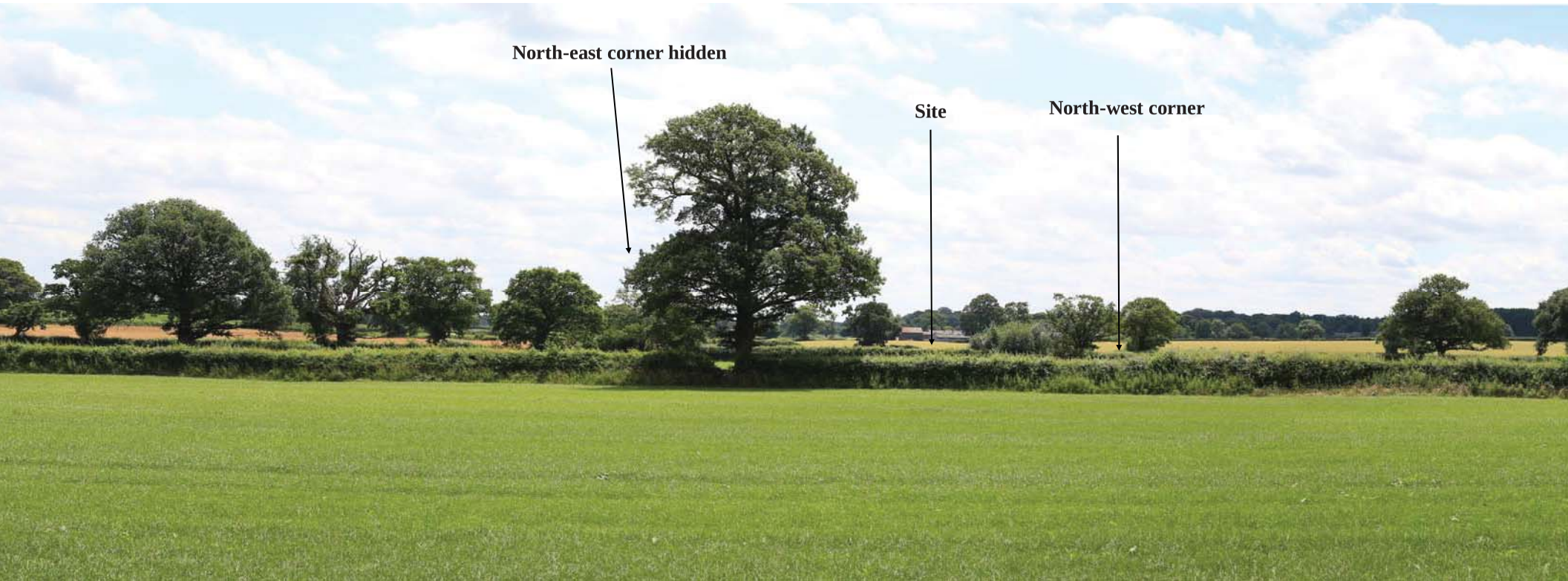


n on Footpath RUA/91.





n-east on Footpath RUA/115.





n-east on Footpath RUA/112.



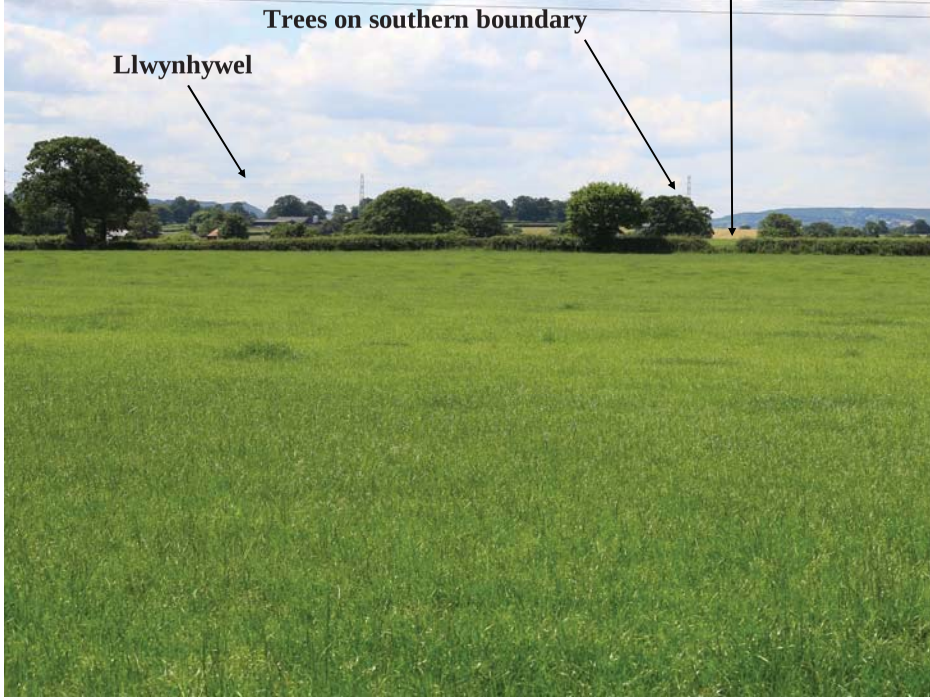
Photograph 8: View from north-east on Footpath RUA/111.







th-west on Footpath RUA/95.



Photograph 12: View from east on Footpath RUA/93.





Appendix 9.5



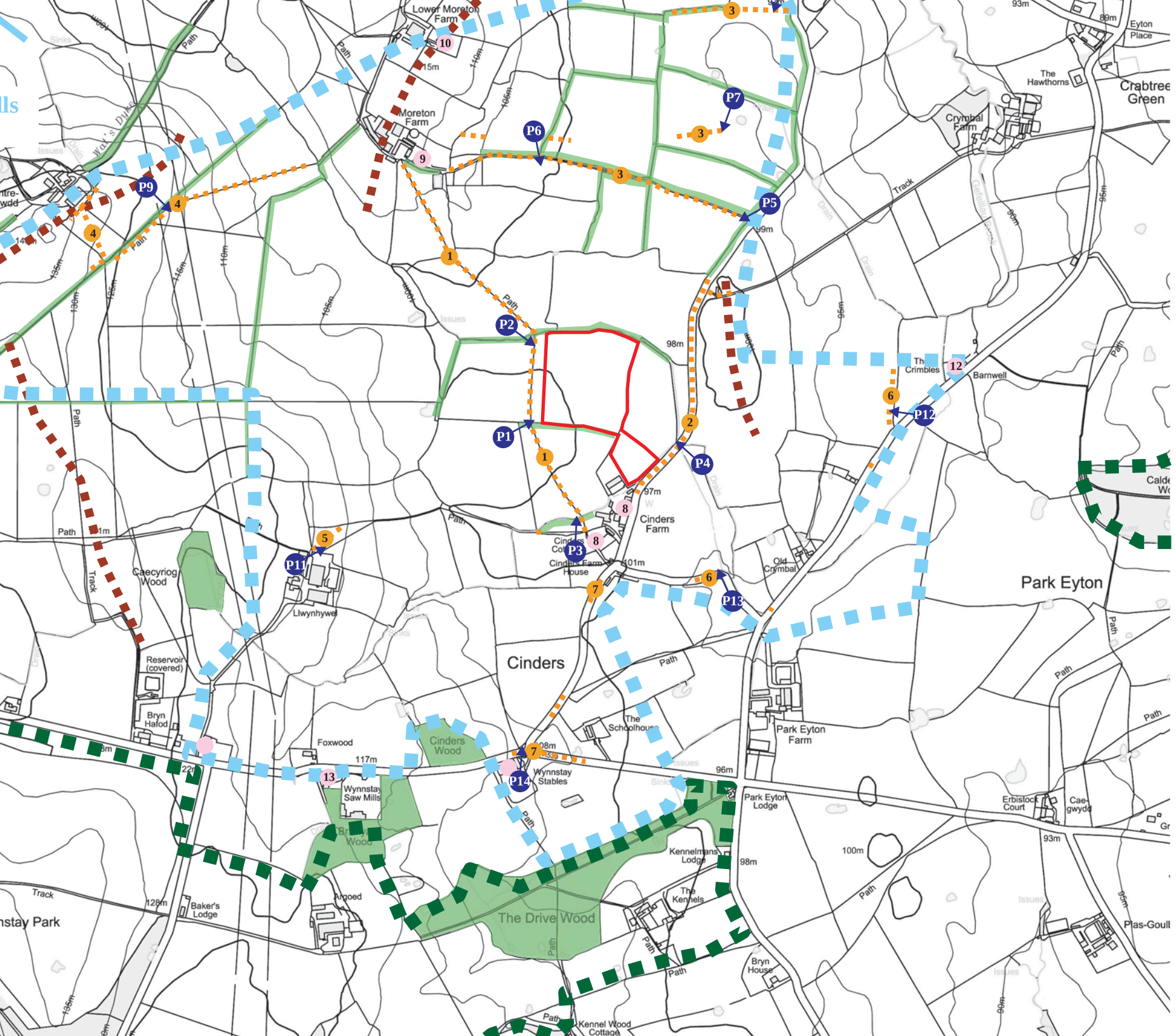
Job: **Proposed**
Cinders F
Ruabon, W

Title: **Public Rig**

Scale: **1:10,000**

Drawing No: **148**

Appendix 9.6



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Job: Proposed
Cinders F
Ruabon, W

Title: Visual Re

Scale: 1:10,000

Drawing No: 148

Appendix 9.7



Welsh Maelor 13a

This is one of a series of Local Planning Guidance Notes based on Wrexham LANDMAP (adopted November 2004), setting out recommendations for each Landscape Character area.



Attractive undulating lowland farmland to the south of Wrexham town and west of the River Dee, containing a number of large estates

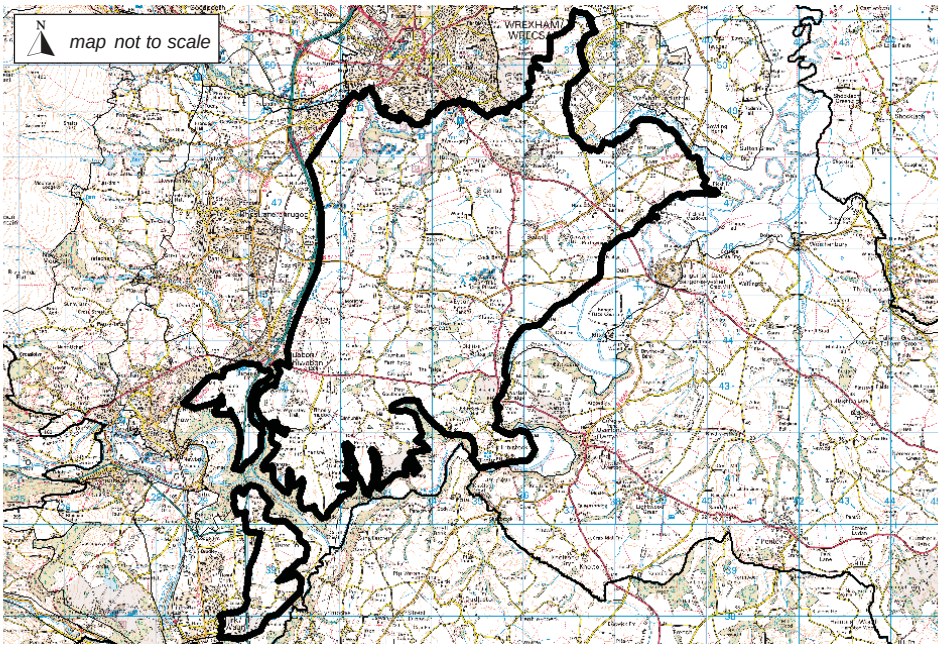
Landscape context

This lowland rural area is similar to the English Maelor and Dee Terraces, and to the Cheshire and North Shropshire Plain beyond the Wrexham boundary. However it is geographically and historically separated from the English Maelor by the River Dee, and former administrative boundaries, and is currently more affected by proximity to urban areas

Welsh Maelor summary:

- Undulating, mainly pastoral lowland farmland
- Well-managed hedges with hedgerow trees and small woodlands
- Historic designed estates influence a large propotion of this area
- Field ponds abundant on areas with clay soils
- Historic settlement pattern with remnants of medieval ridge and furrow
- Erddig estate important for tourism, recreation, nature conservation and heritage
- Wat's Dyke runs north-south through area
- Patches of valuable semi-natural habitats, especially in Clywedog valley
- Affected by urban pressures and economic changes to farming

Map of Welsh Maelor Landscape Character Area



Character Area boundaries should be considered transitional rather than precise

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Key characteristics

Visual character:

- Good views to the hills and over the Dee Valley from higher ground
- Undulating estate farmland with mosaic of farmland and trees (N. and S. areas) and undulating open farmland in the central area
- Designed parks and gardens
- Generally an abundance of well managed hedgerows and hedgerow trees
- Traditional red brick farmsteadings but many barns now converted to residential uses
- Tranquillity and landscape quality affected by A483 and pylons to west

Geological character:

- Deep deposits of glacial drift overlie bedrock of Carboniferous and Triassic age
- Glacial till (boulder clay) covers a large part of the character area, with glacial sands and gravels found mainly in the area immediately to the south of Wrexham town, and in the river terrace on which Eyton Grange is situated
- The area drains to the Clywedog in the north and to the River Dee in the east and south

Ecological character:

- The River Clywedog valley south of Wrexham town has a diverse range of valuable semi-natural habitats including wet woodlands, lowland meadows and nationally important wetlands (especially for invertebrates) with areas of fen sedge, herb-rich swamp and rush pasture
- Farm orchards are now rare, but a valuable old orchard survives at Erddig
- Semi-natural upland mixed ash woodlands, other broadleaved woodlands and plantations are characteristic of the northern and southern areas, forming a mosaic of woodland and farmland. Mixed plantations are also found in the south
- Although most grassland is improved, remnants of high value neutral grassland survive in the central and northern areas
- The Welsh Maelor has valuable remnants of estate parkland or wood pasture with mature and veteran trees - a Biodiversity Priority Habitat
- Field ponds are frequent, and valuable for wildlife

Historical character:

- Medieval military feature - Wat's Dyke earthern bank and ditch cuts across farmland
- Widespread evidence of medieval open fields - ridge and furrow remnants of the Wrexham Lowlands
- Important designed parklands on Cadw Register at Erddig, Wynnstay and Brynkinalt, as well as Penylan, Erbistock and Rosehill
- Non-planned settlement with medieval origins at Gyfelia and Crabtree Green
- 19th/20th century ribbon development at Marchwiel
- Disused Ellesmere railway
- Remnants of former ordnance depot at Parkey area south of Wrexham Industrial Estate



Cultural character

- Still predominantly agricultural, with dispersed farms
- Farmsteads and villages affected by commuter pressure, with residential conversions and new housing
- Sense of place - Erddig and Wynnstay in particular
- Wynnstay Estate once culturally dominated the southern part of the Welsh Maelor but the buildings of the core area are being converted to residential accommodation, enabling restoration of the Grade 1 Capability Brown pleasure gardens
- High level of recreational use in Erddig and Clywedog Valley, and extensive network of small lanes and rights of way in all parts except Wynnstay

Landscape sensitivity

The traditional Welsh Maelor landscape is very vulnerable to continuing development and recreational pressures, to economic changes which threaten traditional farming, and from land use practices and development which do not take historical landscape features into account.

For further information contact:

Planning Environment
Planning Department
Wrexham County Borough Council
Lambpit Street, Wrexham. LL11 1AR

Tel:01978 292019

www.wrexham.gov.uk/planning

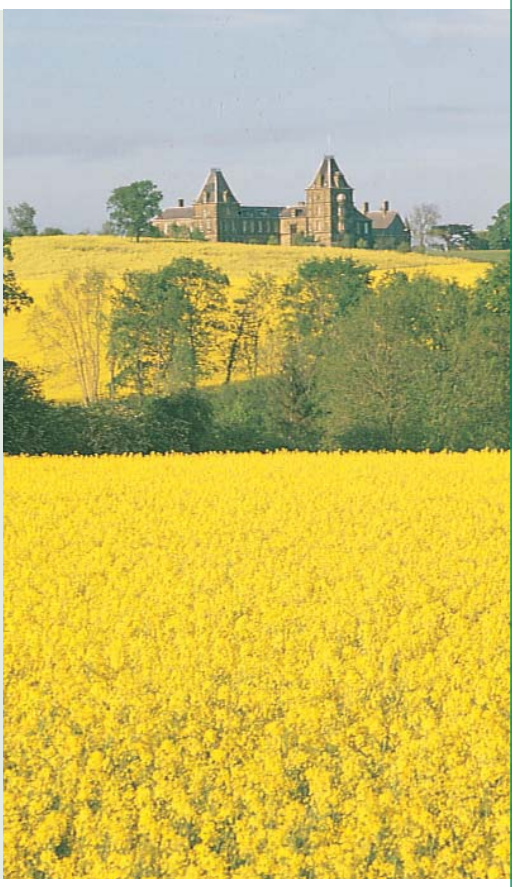
All our information is available in accessible formats

Welsh Maelor - North Central and South

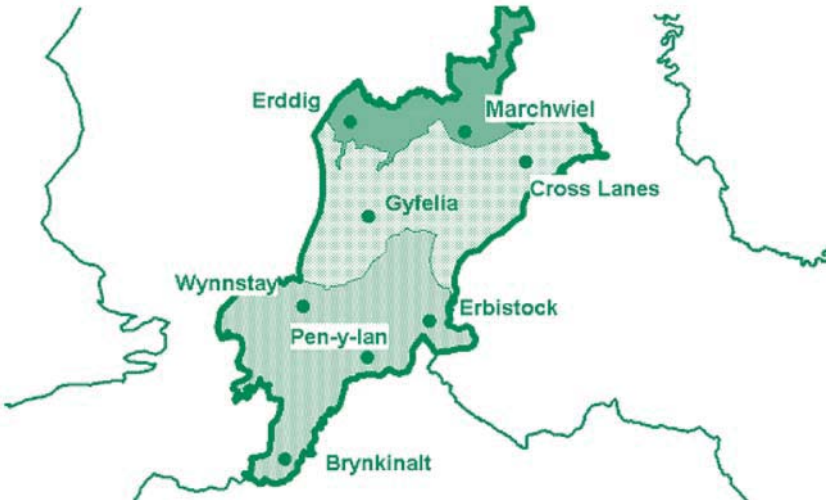
The northern part, nearest to Wrexham drains into the River Clywedog, and has a high proportion of land belonging to the estates of Erddig, Marchwiel, Bryn y grog and Cefn Park. This area is particularly valuable for nature conservation and informal recreation.

The southern part also has a high proportion of land in former or existing estate management, including Wynnstay, Penylan and Brynkinalt. Some of these estates also extend into the Dee-Ceiriog Wooded Valley landscape character area.

The central part is generally open farmland with dispersed farms and hamlets where former estate influence is weaker. It includes a small semicircular flat area around Eyton Grange which is a terrace of the River Dee.
Attractive undulating lowland farmland to the south of Wrexham town and west of the River Dee, containing a number of large estates.



The Welsh Maelor can be subdivided into 3 areas:





Overall management strategy:

Conservation and sustainable rural development

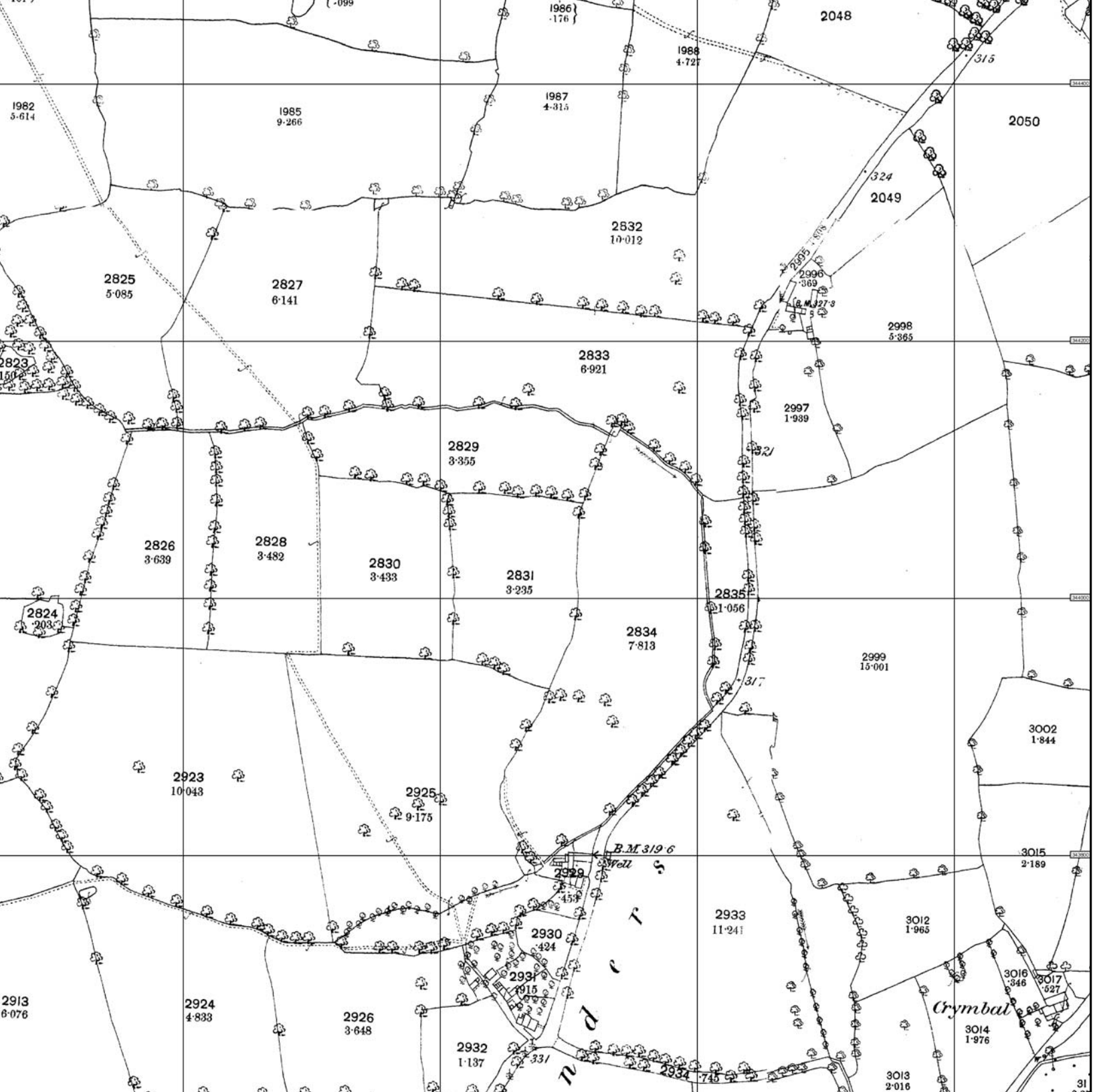
Management Guidance

Aims	Guidelines
Conserve rural character	● Promote replacement planting of hedgerow trees, particularly oaks and ash to ensure perpetuation of characteristic landscape ● The area is particularly sensitive to the 'suburbanisation' of farm steadings - resist ● The character of rural villages and their settings are particularly sensitive to new development ● Encourage Village Design statements by local residents ● Areas for Horsiculture are to conserve traditional field boundaries and avoid the proliferation of fences, structures and buildings within the countryside, where this would erode character
Protect and enhance historic landscape	● Protect estate landscapes and estate-influenced landscapes and consider Cadw listing of stone boundary walls and other significant designed landscape features not protected at present ● Protect fieldscape and areas of medieval ridge and furrow ● Increase awareness and appreciation of historical landscape character ● Preserve surviving features in designed landscapes and avoid subdivision or development of parklands ● Prevent woodland regeneration on Wat's Dyke and Erddig Motte and Bailey ● No development on or near Wat's Dyke - contact Cadw ● Preserve Gyfelia field boundaries ● Preserve by record medieval features at Crabtree Green
Preserve geodiversity	● Preserve disused railway, relate to wider industrial landscape
Conserve and manage ponds and other aquatic and wetland habitats	● Maintain integrity of landforms, including glacial and fluvial landforms, and assess new exposures ● Maintain high pond density, restore and enhance ponds.Protect species associated with ponds, eg bats, newts, water vole, lesser silver diving beetle ● Enhance river bank habitats and minimise hard bank engineering; such as canalisation and retaining walls; protect otters and water voles ● Refer to River and Pond Habitat Action Plans and Otter Species Action Plan of Wrexham Biodiversity Action Plan ● Restrict drainage in wetland sites
Enhance and restore biodiversity of historic parklands	● Enhance and expand wood-pastures and retain veteran trees and fallen timber ● Protect wood-pasture from agricultural intensification
Manage farmland for nature conservation	● Diversify general agricultural land and enhance and extend hedgerows ● Develop green networks to link fragmented habitats and species ● Maintain arable headlands and wide field margins ● Enhance and extend orchards and preserve historic fruit varieties
Conserve and manage woodlands	● Maintain, expand and link fragmented native woodlands ● Replace coniferous trees with native broadleaved trees in woodlands and increase diversity in woodland structure and retain old/dead standing or fallen trees ● Restrict grazing in woodlands
Manage grassland to increase biodiversity	● Protect and manage lowland meadows and enhance lowland pastures ● Encourage cattle grazing in rush pastures
Preserve rural heritage and encourage sustainable rural development	● Maintain historic appearance of area, encourage local businesses ● Support National Trust initiatives ● Develop strategy for sympathetic new build in rural villages ● Preserve local distinctiveness, in particular agricultural buildings

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Back

Appendix 9.8



Landm
INFORMATION

Landmark Hist

Appendix 9.9