FLOOD RISK ASSESSMENT FOR PROPOSED RESIDENTIAL DEVELOPMENT AT HALL GATE, CHURCH END, FLEET, SPALDING, LINCS.

FINAL REPORT

GEOFF BEEL CONSULTANCY

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GCB/STATUS DESIGN

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Fig 4 - South East Lincs. Strategic Flood Risk Assessment Map – Residual Depth of Flooding 2115

Fig 5 - South Holland Internal Drainage Board District Plan

1.0 INTRODUCTION

1.1 An outline planning application is to be submitted by Status Design on behalf of Mr D Barker for proposed residential development at Hall Gate, Church End, Fleet, Spalding, Lincs.

1.2 A Flood Risk Assessment is required to accompany the planning application and meet the requirements and general principles contained in the Planning Practice Guidance to the National Planning Policy Framework (NPPF) and for approval by the Environment Agency.

The site, as situated, is partly located within Flood Zones 1 & 2 of the Environment Agency Flood Map for Planning. The latest Agency Flood Maps have been created as a tool to raise awareness of flood risk with the public and our partner organisations, such as Local Authorities, Emergency Services and Drainage Authorities. The Maps do not take into account any flood defences.

The site is also shown in a "Low Hazard" Residual Zone of the South East Lincs. Strategic Flood Risk Assessment Maps and in the South Holland Drainage Board district.

1.3 Geoff Beel Consultancy was appointed on 18th January 2019 to undertake a Flood Risk Assessment.

2.0 LOCATION

2.1 The development site is located to the south of Fleet Church and on the west side of Hall Gate. The National Grid Reference of the central point of the development is TF 38862355.

2.2 The position and extent of the site is shown on Fig 1 – Location Plan at the end of the document.

2.3 The site, located within the South Holland Drainage Board district is shown partly within Flood Zones 1 & 2 as detailed on the Environment Agency Flood Map for Planning and in a "Low Hazard" Residual Zone of the Council's Strategic Flood Risk Assessment Map as defended by the Internal Drainage Board system.

3.0 THE SITE AND SEQUENTIAL TEST

3.1 The site is open ground.

3.2 The area of development is approximately 0.79 hectare.

3.3 The proposed site layout consists the construction of 2 two-storey dwellings and garages.

3.4 The Sequential Test and Exception Test will require to be applied by the Local Planning Authority but the development may be permitted as the site is protected against both the 1 in 200 year return period tidal event and the 1 in 100 year return period fluvial event and located in a "Low Hazard" Residual Zone of the Council's Strategic Flood Risk Assessment Map. Hence the Sequential Test is met.

3.5 Flood mitigation measures have been incorporated into the design and construction of the dwellings by raising finished floor levels above existing ground level with flood resilient construction to safeguard against the risk of flooding as result of a breach to The Wash or River Nene tidal defences and to ensure the proposals pass Part 2 of the Exception Test with an adequate water exclusion strategy for the design flood and breach event.

4.0 EXISTING FLOOD ALLEVIATION MEASURES

4.1 The site is within a defended floodplain, as defined in Appendix 1 of the Environment Agency's 'Policy for the Protection of Floodplains' and is considered to be passive until such time as a flood greater than that for which the defences were designed occurs. The likelihood of flooding due to overtopping or failure of a flood defence embankment is considered to be small.

The South Holland Drainage Board is protected by a combination of the River Welland tidal defences downstream of Spalding, the River Welland fluvial embankments as well as the River Nene tidal defences downstream of Foul Anchor and the Wash frontage.

The site is located approximately 8.50kms to the west of the River Nene, approximately 9.00kms south of the Wash whilst the River Welland is approximately 12.50kms to the west.

4.2 The site and the surrounding land drains by gravity to IDB main drains and hence to the tidal River Nene at the Sutton Bridge Outfall Sluice. Land level at the site is generally at 3.00m aOD.

4.3 The existing standard of drainage for the South Holland Internal Drainage Board is 1 in 50 years return period, compatible with the Department of the Environment, Food and Rural Affairs target level of service for rural drainage and flood defence works. Freeboard of 900mm is provided to the lowest land levels.

4.4 Current maintenance standards within the South Holland Internal Drainage Board and of the Environment Agency defences are generally very good.

During the operation and maintenance of its pumping stations, associated structures and channel systems, particularly those that could affect property, the Board seeks to maintain a general standard capable of providing flood protection to its district. A routine maintenance programme is in place to ensure that the Boards assets are commensurate with the standard of protection that is sought. However, bank slips, blocked culverts etc may occur from time to time and these matters are usually dealt with promptly.

5.0 POTENTIAL SOURCES OF FLOODING

5.1 Four potential sources of flooding have been identified as a result of this assessment:

a) local blockages to IDB main drain system.
b) storm return period of 1 in 50 years being exceeded
c) failure of Sutton Bridge Outfall Sluice
d) overtopping and breaching of defences of the tidal River Nene

5.2 The probability of flooding from source a) is low due to the maintenance standards already achieved and managed by the IDB.

The probability of flooding from b) is also low due to the South Holland IDB main drain design standard incorporating a minimum 900mm freeboard to the lowest land level which provides adequate storage in events greater than 1 in 50 years.

Previous historic rainfall events of 1968 and 1978, estimated to be greater than 1 in 100 year events, caused no flooding to any residential properties at the time and the Boards policy is to provide a standard of drainage which satisfies (NPPF) requirements of a 1 in 100 year return period for fluvial protection inclusive of the effects of climate change and developments to the arterial system enables a flexible approach to be adopted and meet the criteria for "sustainable urban drainage".

5.3 Failure of Sutton Bridge Outfall Sluice may occur due to long term mechanical breakdown or power supply being disrupted. However, in these circumstances, if conditions were such as to put properties and land at risk of flooding, the Internal Drainage Board would take emergency action to maintain the drainage level of service by utilising temporary pumping equipment. The probability of such an occurrence is also considered to be low.

5.4 The flood embankments to the tidal River Nene provide a 1 in 200 year return period level of protection.

The Environment Agency has recently published The Wash Shoreline Management Plan 2 from Gibraltar Point to Old Hunstanton. The summary of the plan between Gibraltar Point and Wolferton Creek is as follows:

The intent of management for this Policy Development Zone (PDZ) is to sustain flood defence for the communities and their hinterland on the low-lying areas around The Wash. This includes an increase of management as needed to sustain the current level of flood risk in the face of climate change.

5.5 The proposed drainage system is to soakaways within the development site which will accommodate the 1 in 100 year rainfall event inclusive of climate change designed to BRE 365 requirements and Building Regulations approval.

5.6 It is necessary to mitigate against any residual flood risks and flood resilient construction should be incorporated up to 300mm above finished floor level of the proposed new dwellings with floor levels raised 300mm above existing ground level.

6.0 EXTENT OF KNOWN FLOODING

6.1 During the preparation of this assessment, no evidence was discovered of the site being flooded or of any adjoining properties.

7.0 PROBABILITIES AND TRENDS OF FLOODING

7.1 The probability of this development flooding from localised drainage systems is very low.

7.2 The probability of the site flooding with water from any South Holland IDB main drain is less than 1% because of the standards of the existing flood defence systems, storage within existing drainage channels and the location of the site.

7.3 The probability of the site flooding with fluvial waters from any main river system is less than 1% because of the standards of the existing flood defences and the location of the site.

7.4 If under very extreme events, levels of floodwater from the South Holland IDB main drains or arterial systems rose to such an extent that the site was affected, the situation would not be sudden. It is very probable that sufficient time would be available to take precautionary actions to limit the extent and potential impact of flooding.

7.5 The water levels in the drainage channels will tend to rise as a result of the impacts of climate change. However the existing systems and defences together with the floor levels 300mm above existing ground level and 300mm of flood resilient construction above finished floor level will be acceptable for the design life of the development (i.e. 100 years).

8.0 IMPACTS OF FLOODING

8.1 No significant impacts of flooding are anticipated.

8.2 Land levels of the development site are generally at 3.00m aOD such that proposed finished floor level together with the flood resilient construction and the proposed drainage system will offer additional protection against impacts arising from any extreme short duration, localised events.

8.3 The general location of the site within the catchment is such that if flooding occurred from any of the South Holland IDB main drain systems, then probably 2 to 3 days warning time would be available.

8.4 No displacement of water from the site will affect any adjoining properties. The site will have a soakaway drainage system such that surface water drainage is attenuated.

8.5 The developer will ensure that the eventual occupiers of the dwellings are sufficiently aware of the risk of flooding, and the standard of the existing defences. The Environment Agency provides a Flood Warning Service which includes Flood Warnings Codes and uses direct warning methods where the risks and impacts of flooding are high. Indirect warnings are provided to all flood risk areas, event those at low risk of flooding. The main method is media broadcasts via local radio and also by television.

In addition to direct and indirect flood warnings the Environment Agency operates a 24 hour a day Floodline Service providing advice and information on flooding, contact tel. no. 0345 988 1188 and the occupiers of the dwellings should register with the Floodline Direct Warnings Service to receive any future flood warnings.

8.6 Safe and dry access/egress is available after receipt of a flood warning from Fleet to Holbeach where land is also in Flood Zone 1 and facilities available.

9.0 RESIDUAL RISK – EXTREME EVENTS

9.1 The residual risk from extreme events is very low on this site, because of its location, within the South Holland IDB area and its location 8.50kms from the River Nene tidal defences.

9.2 The site is partly within Flood Zones 1 & 2 with a very low risk of flooding due to the current standards of drainage and flood defence and land levels. The site is not located within a Functional Flood Plain of any 'main river' or 'main drain'. The Environment Agency Flood Map for Planning has been produced irrespective of existing flood defences and standards of protection.

9.3 South Holland District Council and Boston Borough Council in conjunction with the Environment Agency and the local IDB's within the Council's area have carried out a Strategic Flood Risk Assessment of the whole District by appointed Consulting Engineers.

The South East Lincs. Strategic Flood Risk Assessment has produced more definitive Flood Risk Maps than those published by the Environment Agency and at the same time has analysed flood return periods of all tidal and fluvial defences up to 2115 to account for the effects of climate change.

Breach scenarios of embankments failing and/or being overtopped have also been carried out to establish Flood Risk Zones.

9.4 As a result of the South East Lincs. Strategic Flood Risk Assessment; the South Holland Main Drain and associated IDB main drains have been determined as providing protection against a 1 in 100 year return period event up to 2115 inclusive of the effects of climate change.

9.5 The development site has been identified outside of any Flood Zone from the South Holland Main Drain and associated IDB main drain up to the year 2115 but could be affected by floodwaters as a result of breaching of the River Nene tidal defences.

10.0 CONCLUSIONS AND RECOMMENDATIONS

10.1 As a result of the assessment, the following conclusions have been reached:-

- The proposed development is not in a Functional Floodplain. It is located in the Passive Floodplain protected by defences to a 1 in 100 year return period, (1.0%)

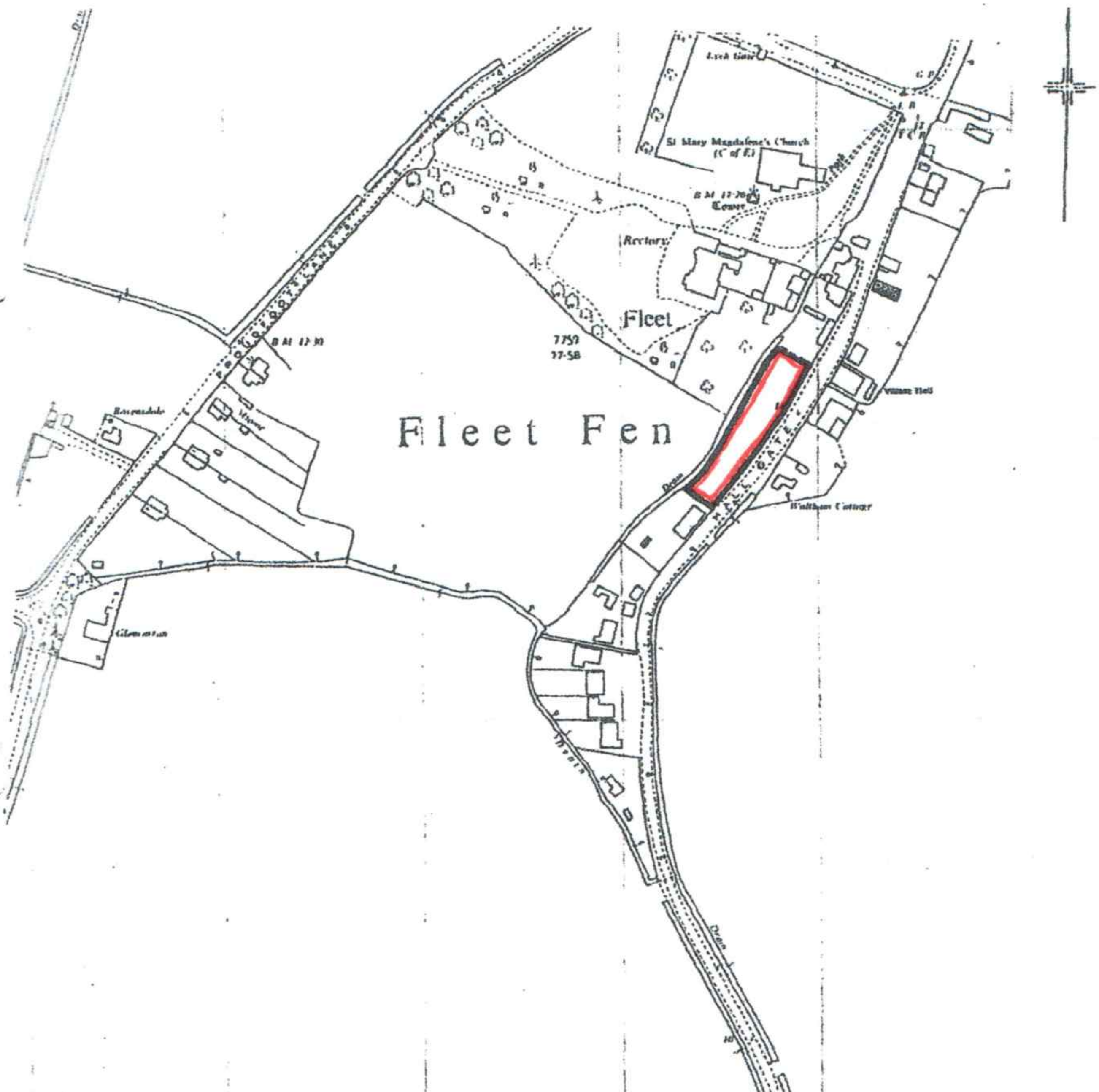
- The site is partly in Flood Zones 1 & 2 with the actual risk of site flooding from any Environment Agency river system being very low (less than 0.5%). The site has also been identified as being in a "Low Hazard" Residual Zone of the South East Lincs. Council's Strategic Flood Risk Assessment Maps.

- Although the site is located within an Internal Drainage District with a minimum standard of drainage of 1 in 50 years, this accords with Defra guidelines for rural development. Freeboard to design water level of 900mm to lowest land level is available for events greater than 1 in 50 years providing further storage within the drainage channels.

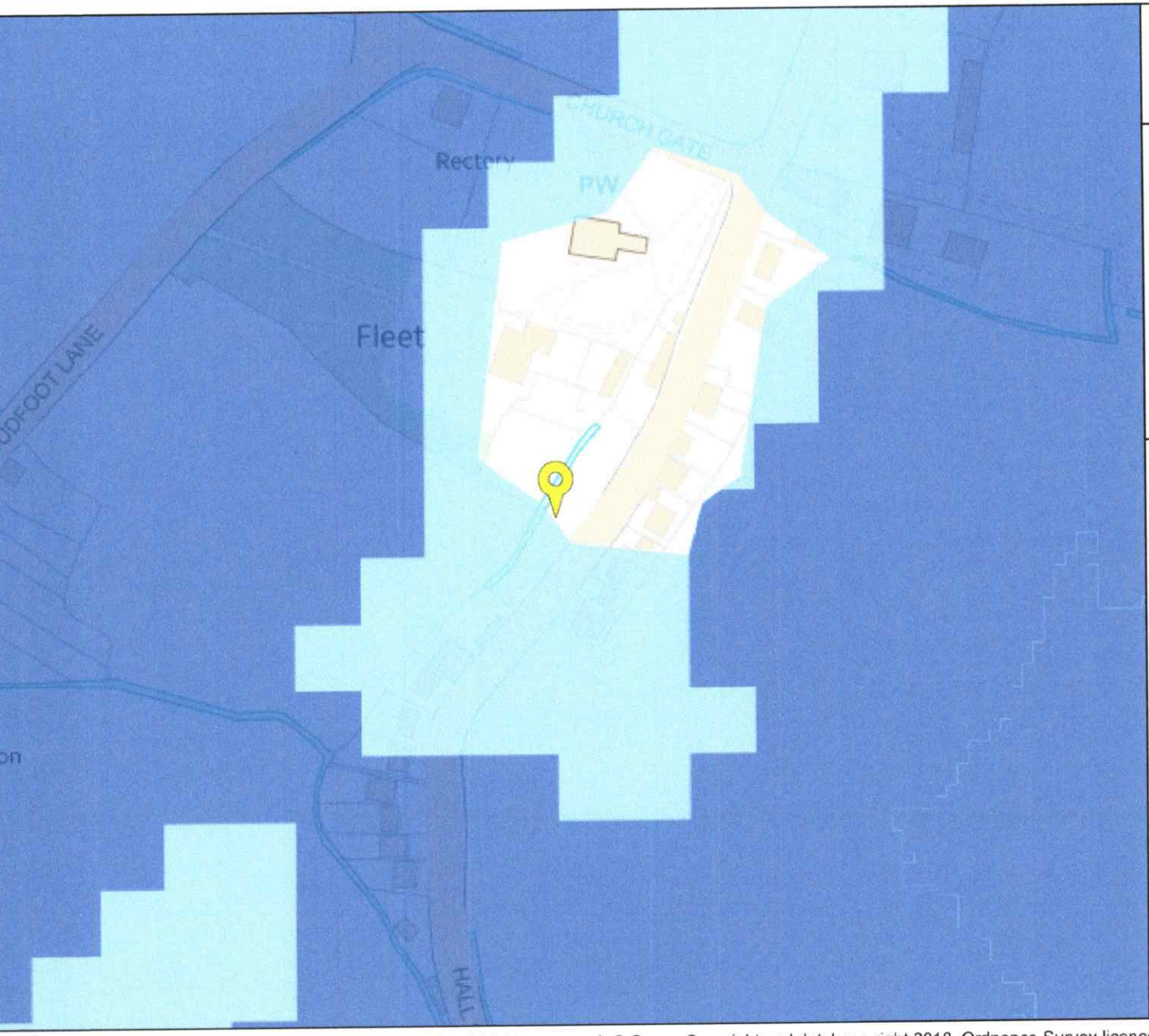
- On site rainwater from the development will be discharged to soakaways to BRE 365 design requirements.

- Floor levels are 300mm above existing land level with a further 300mm of flood resilient construction above finished floor level of the proposed dwellings to safeguard against the risk of flooding from tidal defences being breached in year 2115.

H.M. LAND REGISTRY		TITLE NUMBER LL71722
ORDNANCE SURVEY PLAN REFERENCE	TF3823	Scale 1/2500
COUNTY LINCOLNSHIRE	DISTRICT SOUTH HOLLAND	© Crown copyright



FILED PLAN



Environment Agency

Flood map for planning

Your reference
PE12 8NG

Location (easting/northing)
538863/323554

Scale
1:2500

Created
1 Dec 2018 10:30

- Selected point
- Flood zone 3
- Flood zone 3: areas benefitting from flood defences
- Flood zone 2
- Flood zone 1
- Flood defence
- Main river
- Flood storage area

0 20 40 60m

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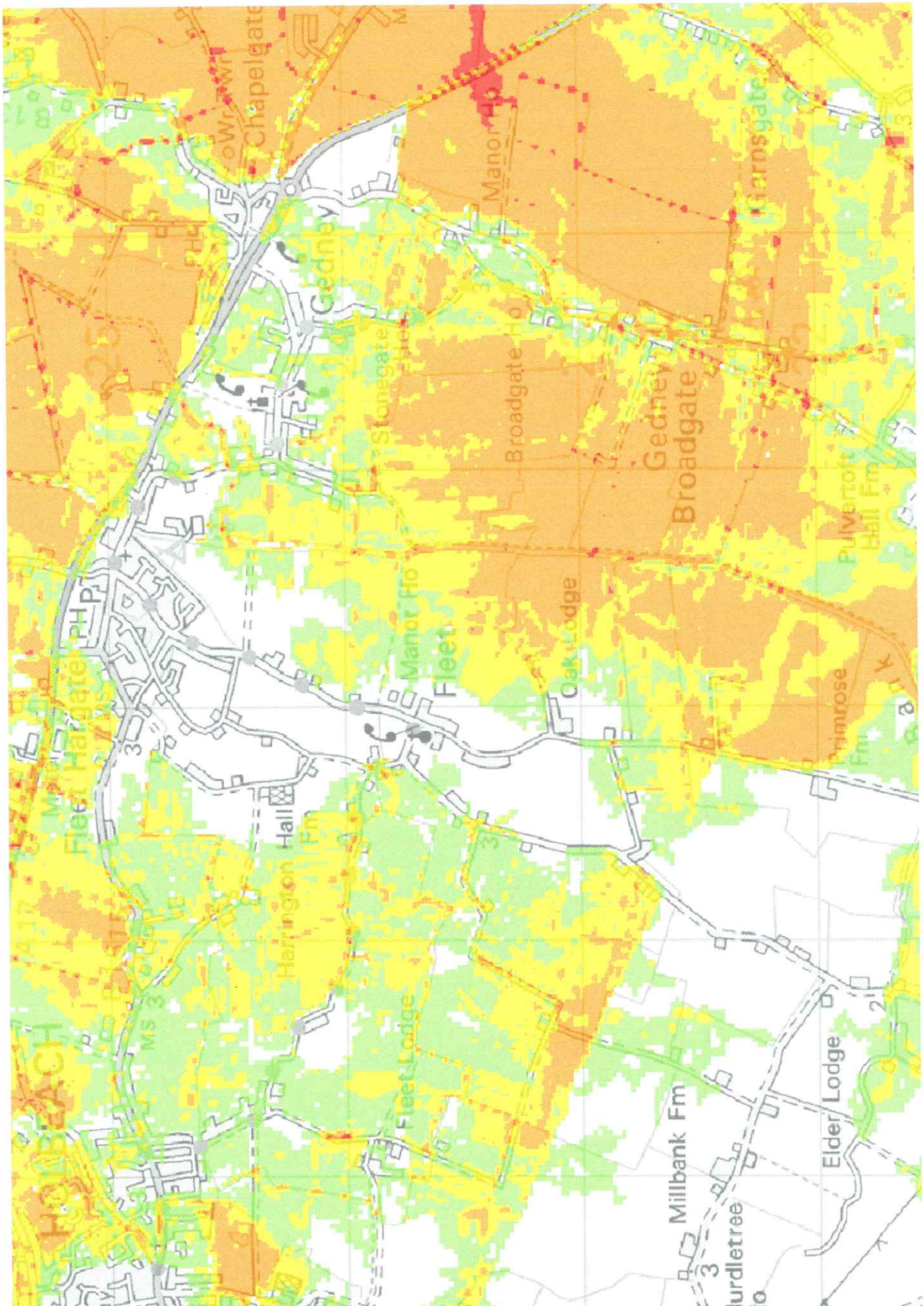
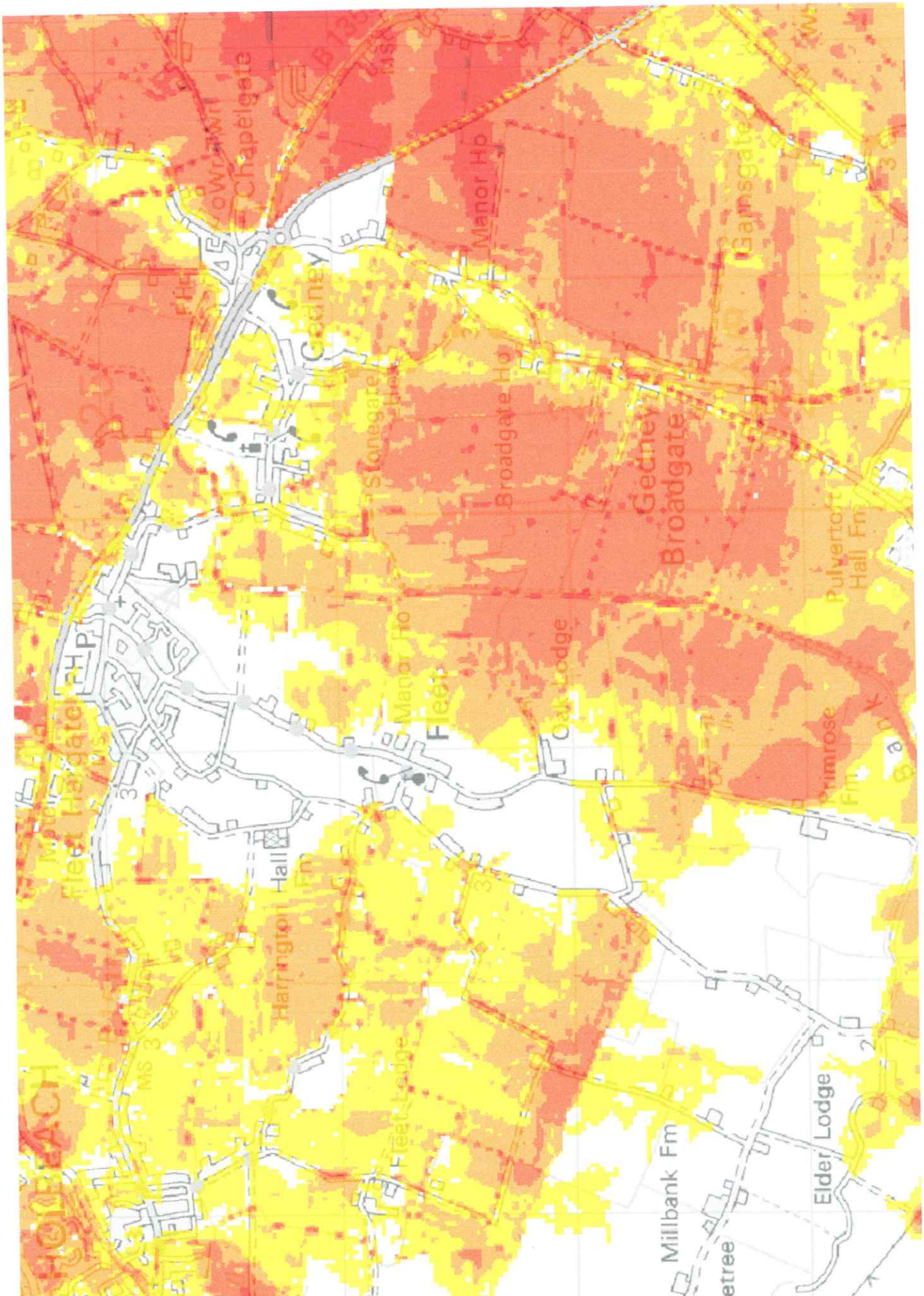
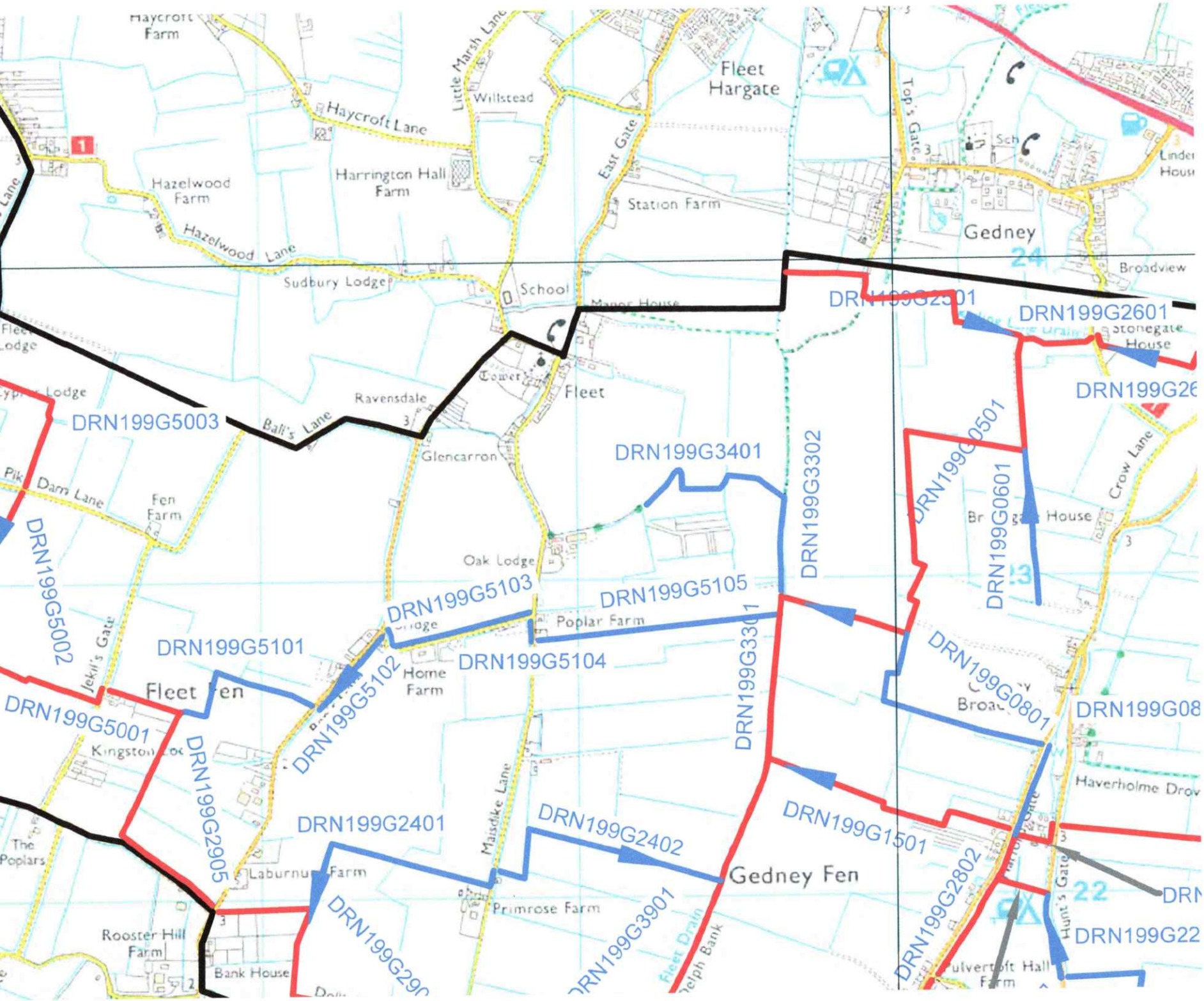
Residual Hazard Zone 2115



Residual Flood Depth Map 2115




Haycroft Farm
Little March Lane
Willstead
Fleet Hargate
Haycroft Lane
Hazelwood Farm
Harrington Hall Farm
East Gate
Station Farm
Top's Gate
Gedney
Hazelwood Lane
Sudbury Lodge
School
Manor House
Broadview
DRN199G2601
Stonegate House
Fleet Lodge
Tower
Fleet
Ravensdale
Bali's Lane
DRN199G5003
Glencarron
DRN199G3401
DRN199G3302
DRN199G0501
DRN199G0601
Crow Lane
Pik
Dam Lane
Fen Farm
Oak Lodge
DRN199G5002
DRN199G5103
DRN199G5105
Poplar Farm
Jekil's Gate
DRN199G5101
DRN199G5104
Home Farm
DRN199G5102
Fleet Fen
DRN199G5001
DRN199G0801
DRN199G08
Kingston Lodge
DRN199G2905
Haverholme Drov
DRN199G2401
DRN199G2402
Maisdike Lane
DRN199G1501
The Poplars
Laburnum Farm
Gedney Fen
DRN199G2802
Primrose Farm
DRN199G3901
Fleet Drain
Rooster Hill Farm
Bank House
Hunt's Gate
DRN199G22
Fulvertoft Hall Farm