APPENDIX 3

Technical Baseline Information

DAVID LOCK ASSOCIATES

Air Quality Baseline Technical Report (AECOM)

Air Quality Baseline Technical Report (AECOM)

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Silfield Garden Village

Air Quality Baseline Technical Report

March 2020

Quality information

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Revision History

Revision	Revision date	Details	Authorized	Name	Position
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Tables

1. Executive Summary

A qualitative review of local air quality has been conducted to support the Regulation 18 submission for plans for the development opportunity in Silfield Garden Village. This review has identified that levels of air quality in the local area are generally good and there are no Air Quality Management Areas within South Norfolk District Council and no measured exceedances of the UK air quality strategy objectives.

No major constraints were identified as part of the review. However, during construction, it is advised that best practice mitigation measures are put in place to minimise any potential impacts and that construction vehicles use the strategic road network to access the site, rather than local roads. During occupation of the site, there is also the potential for increased exposure at residential properties located close to the A11. The current masterplan is for residential properties to be built alongside the A11 behind trees at a distance of around 30m-40m which is likely to be acceptable.

A detailed air quality assessment should be submitted to support future planning application(s) for these properties. Subject to further modelling to take into account details such as height of receptors in relation to the road, local traffic flows, emission from energy centres, etc, mitigation measures may be required to ensure concentrations of pollutants achieve acceptable levels

2. Introduction

2.1 Orbit Homes are leading the promotion of a major new residential led, mixed use, strategic garden village development on land at Silfield in Norfolk, with a view for it to be included in the Greater Norwich Local Plan (GNLP). Orbit Homes are working with others including Bowbridge Strategic Land to promote the site for this use.

2.2 The purpose of this review is to provide advice on air quality to support the work conducted for the Regulation 18 consultation response for Silfield Garden Village.

2.3 A desk-based appraisal has been conducted to identify the current air quality environment within a defined study area around Silfield Garden Village based on the following sources of information and existing data;

- Background air pollution concentrations of nitrogen dioxide (NO_2) and fine particulates (PM_{10}) from Department for Environment, Food and Rural Affairs (Defra);
- Air quality monitoring data from South Norfolk Council and Defra;
- Natural England data on designated international, national and local ecological sites;
- Google mapping information on sensitive receptors such as residential properties, schools and hospitals; and
- Local air pollution sources and cumulative impacts from other development sites as well as from industrial sites from Council planning information and website.

2.4 Based on this information, a summary of the key constraints and opportunities to air quality has been provided and recommendations given for any mitigation measures that may be considered as part of the development of the garden village.

3. Policy

National Air Quality Strategy

3.1 The UK National Air Quality Strategy (AQS) was initially published in 2000, under the requirements of the Environment Act 1995[1]. The most recent revision of the Strategy[2] sets objective values to help Local Authorities manage local air quality improvements in accordance with the EU Air Quality Framework Directive.

3.2 The air quality objective values have been set down in regulation for the purposes of local air quality management (LAQM). Under the LAQM regime, local authorities have a duty to carry out regular assessments of air quality against the objective values and if it is unlikely that the objective values will be met in the given timescale, they must designate an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) with the aim of achieving the objective values. The boundary of an AQMA is set by the local authority to define the geographical area that is to be subject to the management measures to be set out in a subsequent action plan. It is not unusual for the boundary of an AQMA to include within it, relevant locations where air quality is not at risk of exceeding an air quality objective.

3.3 The UK's national air quality objective values for the pollutants of relevance to this assessment are displayed in Table 1.

Table 1 Key National Air Quality Strategy Objective

Pollutant	Averaging Period	Value	Maximum Permitted Exceedances	Target Date
Nitrogen Dioxide (NO_2)	Annual Mean	40 µg/m^3	None	31/12/2005
	Hourly Mean	200 µg/m^3	18 times per year	31/12/2005
Particulate Matter (PM_{10})	Annual Mean	40 µg/m^3	None	31/12/2004
	24-hour	50 µg/m^3	35 times per year	31/12/2004
Fine Particulate Matter ($PM_{2.5}$)	Annual Mean	25 µg/m^3	None	2020

3.4 The principal air quality legislation within the United Kingdom is the Air Quality Standards Regulations (as amended 2016)[3] which transposes relevant EU Air Quality Directives into national legislation.

Clean Air Strategy

3.5 In 2019, the UK government released its Clean Air Strategy 2019[4], part of its 25 Year Environment Plan. The Strategy places greater emphasis on improving air quality in the UK than has been seen before and outlines how it aims to achieve this (including the scheme of new enabling legislation).

3.6 Air quality management focus in recent years has primarily related to one pollutant, NO_2, and its principal source in the UK, road traffic. However, the 2019 Strategy broadens the focus to other areas, including domestic emissions from wood burning stoves and from agriculture. This shift in emphasis is

[1] H.M. Government (1995). The Environment Act.
[2] Department for Environment Food and Rural Affairs (Defra) (2007), The Air Quality Strategy for England, Scotland, Wales and Northern Ireland.
[3] H.M. Government (2015), The Air Quality Standards Regulations. SI 1001, The Stationery Office.
[4] Department for Environment Food and Rural Affairs (Defra) (2019), Clean Air Strategy.

part of a goal to reduce the levels of fine particulate matter ($PM_{2.5}$) in the air to below the World Health Organisation guideline level; far lower than the current objective.

National Planning Policy Framework

3.7 The revised National Planning Policy Framework (NPPF) was published in February 2019 which sets out the Government's planning policies for England and how these are expected to be applied[5]. This NPPF supersedes the previous NPPF published in March 2012. Policies and objectives which are of particular relevance to local air quality and noise are summarised below:

"The planning system should actively manage patterns of growth in support of these objectives. Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health."

3.8 Air quality and noise are considered as an important element of the natural environment. On conserving and enhancing the natural environment, Paragraph 170 states that:

"Planning policies and decisions should contribute to and enhance the natural and local environment by: …

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality …"

3.9 Air quality in the UK has been managed through the Local Air Quality Management regime using national objectives. Paragraph 181 of the NPPF states that:

"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. … Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."

Planning Practice Guidance (PPG)[6]

3.10 The PPG was updated on 24th July 2018 with specific reference to air quality to support the NPPF. The PPG states that the planning system should consider the potential effect of new developments on air quality where relevant limits have been exceeded or are near the limit.

3.11 When deciding whether air quality is relevant to a planning application the PPG states that a number of factors should be taken into consideration including if the development will:

- *"Significantly affect traffic in the immediate vicinity of the Site or further afield. This could be by generating or increasing traffic congestion; significantly changing traffic volumes, vehicle speed or both; or significantly altering the traffic composition on local roads. Other matters to consider include whether the proposal involves the development of a bus station, coach or lorry park; adds to turnover in a large car park; or result in construction sites that would generate large Heavy Goods Vehicle flows over a period of a year or more;*
- *Expose people to existing sources of air pollutants. This could be by building new homes, workplaces or other development in places with poor air quality;*
- *Give rise to potentially unacceptable impact (such as dust) during construction for nearby sensitive locations; and/or*

[5] Ministry of Housing, Communities & Local Government (2019), National Planning Policy Framework, the National Archives.
[6] Ministry of Housing, Communities and Local Government (2018), Planning Practice Guidance (PPG).

- *Affect biodiversity. In particular, is it likely to result in deposition or concentration of pollutants that significantly affect a European-designated wildlife site, and is not directly connected with or necessary to the management of the Site, or does it otherwise affect biodiversity, particularly designated wildlife sites."*

3.12 The PPG provides a summary of the air quality issues set out in the National Planning Policy Framework and goes on to note that an air quality assessment in support of a proposed development should include the following information:

- The existing air quality in the study area (existing baseline);
- The future air quality without the development in place (future baseline); and
- The future air quality with the development in place (with mitigation).

South Norfolk Local Plan - Development Management Policies Document (DMPD)

3.13 The DMPD[7] includes the following policy DM 3.14 Pollution, health and safety which states

"*a) All development should minimise and where possible reduce the adverse impact of all forms of emissions and other forms of pollution, and ensure that there is no deterioration in water quality or water courses.*

b) When assessed individually or cumulatively, development proposals should ensure that there will be no unacceptable impacts on:

i. Air quality

ii. Surface and ground water quality

iii. Land quality and condition

iv. Health and safety of the public

...*d) Developments which may impact on air quality will not be permitted where they have an unacceptable impact on human health, sensitive designated species or habitats, and general amenity, unless adequate mitigation can be ensured. Development will not be granted in locations where it is likely to result in an Air Quality Management Area being designated or the worsening of air quality in an existing Air Quality Management Area…"*

Joint Core Strategy for Broadland, Norwich and South Norfolk

3.14 The Joint Core Strategy (JCS)[8] sets out the long-term vision and objectives for the area, including strategic policies for steering and shaping development. Whilst it does not specifically mention air quality, Policy 1: Addressing climate change and protecting environmental assets, notes that;

"The environmental assets of the area will be protected, maintained, restored and enhanced and the benefits for residents and visitors improved.

Development and investment will seek to expand and link valuable open space and areas of biodiversity importance to create green networks. Where there is no conflict with biodiversity objectives, the quiet enjoyment and use of the natural environment will be encouraged and all proposals should seek to increase public access to the countryside".

[7] South Norfolk Local Plan DMPD Adopted October 2015
[8] JCS for Broadland, Norwich and South Norfolk. Adopted March 2011, amendments adopted January 2014. Greater Norwich Development Partnership.

4. Study Area

4.1 The proposed Site for Silfield Garden Village is wholly within South Norfolk District Council. It covers 451 hectares of agricultural land and is located 2km south of Wymondham in South Norfolk and 15km south-west of Norwich. The A11 (Wymondham Bypass), which forms part of the Highways England's strategic road network connecting the A14 and M11, divides the land in two and will provide the main access to the site.

4.2 The masterplan may provide up to 6,500 dwellings, 250,000 square feet of commercial employment as well as one secondary and up to three new primary schools.

4.3 This review focuses on a study area of approximately 1km from the Site Boundary as illustrated in Figure 1.

5. Baseline Conditions

Air Quality Management Areas (AQMAs)

5.1 There are no AQMAs declared in South Norfolk District Council.

Air Quality Monitoring Data

5.2 Under the LAQM regime, South Norfolk District Council monitored NO_2 at 28 diffusion tube sites in 2018. Concentrations at all sites have generally declined over the last few years and are well below the AQS annual mean objective of 40µg/m^3 at all sites. The local authority does not currently measure particulates.

5.3 Recent annual mean NO_2 concentrations measured at the monitoring locations nearest the Site over the last five years has been taken from the local authority's most recent annual status report[9] and are given in Table 2. The location of these sites is given in Figure 1.

5.4 There are also monitoring sites approximately 9km further along the A11 to the north-east. concentrations at these sites are well below the objective.

5.5 There are no Defra monitoring sites located near the Site.

Table 2 Recent Annual Mean NO_2 Concentrations in the Study Area

Site Details (distance from site)	Annual mean NO_2 concentration (µg/m^3)				
	2014	**2015**	**2016**	**2017**	**2018**
DT8 Fairland Street, Wymondham (500m north)	23.4	18.4	23.3	22.0	20.5
DT12 Rightup Lane (within site boundary)	21.4	16.3	21.9	21.2	19.7
DT10 Norwich Road, Wymondham (2km north)	16.7	12.0	18.0	16.5	15.3
DT13 Norwich Road, Wymondham (2km north)	14.2	11.9	15.9	16.1	15.0
DT14 Norwich Road, Wymondham (2km north)	18.1	13.3	17.0	16.2	15.1
AQS Objective			**40**		

Background Pollutant Concentrations

5.6 Annual average background pollutant concentration estimates for NO_2 and PM_{10} have been sourced from Defra's 2017 based background maps[10] for the current year 2020 for the study area around the Site.

5.7 The study area falls into 12 different 1 km grid squares each of which has different background pollution concentrations. The 2020 concentrations are given in Table 3 and illustrated in Figure 2 and Figure 3 for

[9] https://www.south-norfolk.gov.uk/sites/default/files/downloads/asr_template_england_2019_0.pdf
[10] https://uk-air.defra.gov.uk/data/laqm-background-home

NO_2 and PM_{10} respectively. Concentrations of both pollutants are well below the AQS objective of 40 µg/m^3 as an annual mean across the study area.

Table 3 Mapped Background Concentrations (2020)

Year	Easting (m)	Northing (m)	Annual Mean Background Concentration (µg/m^3)	
			NO_2	PM_{10}
2020	611500	301500	11.1	14.0
2020	611500	300500	9.2	14.4
2020	610500	300500	9.0	15.0
2020	610500	299500	9.8	15.6
2020	611500	299500	10.4	15.9
2020	612500	299500	8.6	14.7
2020	610500	298500	9.7	15.7
2020	611500	298500	8.3	15.4
2020	612500	298500	8.1	15.3
2020	610500	297500	8.1	15.1
2020	611500	297500	7.9	14.7
2020	612500	297500	7.8	14.8

Air Pollution Sources

5.8 The main source of emissions within the wider study area is from road vehicles on the A11 (Wymondham Bypass) which is within the site boundary. There is a potential risk of exposure to elevated concentrations of NO_2 and PM_{10} pollutants at properties within 200m of the road if no mitigation is in place.

5.9 There will also be new emissions to air associated with construction and operation of the sites, with residential properties located up to 350m beyond the site boundary being potentially susceptible to amenity and health impacts from dust and road traffic emissions generated during construction. This would be appropriately mitigated through a Construction Environment Management Plan (CEMP) as part of an outline application.

5.10 Based on information from South Norfolk Council's website, there are no industrial sources which may have a potential impact on air quality within 1km of the study area. There local area is largely agricultural land but there have been no recent complaints from farming practices such as poultry farms in recent years.

Sensitive Receptors

5.11 The main types of receptors for local air quality that are considered include:

- Nationally and internationally designated ecological sites such as Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SAC), Special Protection Areas (SPA) and sites listed under the Convention on Wetlands and Wildfowl (Ramsar); and
- Public Exposure Receptors – sensitive locations where relevant exposure for the air quality criteria being assessed could occur e.g. residential properties or schools (as defined in Defra's Local Air Quality Management technical guidance; LAQM.TG16[11]). Additional receptors may be sensitive to deposition of dust and dust soiling (e.g. parks, gardens and allotments) during the construction phase.

5.12 There is only one designated ecological receptor located within approximately 1km of the Site boundary at Lower Wood, Ashwellthorpe SSSI to the south east (see Figure 1). There are other SACs and SSSIs, in the District, but these are more than 5km away.

5.13 There are number of receptors that are sensitive to dust in the immediate vicinity of the Site. These include residential and commercial properties, and farmhouses located within 200 m of the Site and those located in the close proximity to the construction routes. There are also many residential properties and schools located to the north of the site in Wymondham which may be affected by operational impacts from increased traffic associated with the site. Figure 1 indicates the locations of selected receptors as an example of potential areas of concern.

5.14 Once the site is built, there may also be operational impacts from road traffic and energy centre emissions from buildings within the site at new proposed receptors.

5.15 The impacts of air quality on receptors would need to be considered as part of the submitted planning applications.

Cumulative Impacts

5.16 There are a number of planning applications that have been submitted to the local authority in the area including land to the south and east of Rightup Lane (Endurance Site) and the Pelham site east of Silfield Road and north of the A11, both in Wymondham. The potential short- and long-term cumulative impacts of these developments during construction and operation should be considered as part of the planning applications.

[11] https://laqm.defra.gov.uk/technical-guidance/

6. Constraints

Construction Phase

6.1 The site clearance works, construction activities and additional vehicle movements associated with the new developments have a potential to generate an emission of airborne particulate matter and NO_2 concentrations. A consideration should be given to a potential health impact on local sensitive receptors located in the local proximity to or within the Site, as well as those locations alongside the road network used by the construction vehicles. It is advised that construction vehicles should use the strategic road network to access the site, i.e. the A11 or Silfield Road rather than local roads.

6.2 As part of the submission of any planning applications, best practice mitigation measures should be put in place to minimise any potential impacts, for example by committing to a CEMP.

Operational Phase

6.3 During operation, there are potential to change vehicle movements on the A11 and local surrounding road network. An increase in vehicle emissions can increase the exposure at sensitive receptors to concentrations of the key pollutants, NO_2 and particulate matter (both PM_{10} and $PM_{2.5}$). Based on measured concentrations on Newmarket Road further along the A11 towards Norwich, it is recommended that the masterplan design does not incorporate any new residential properties within 20m of the A11. The current masterplan is for residential properties to be built alongside the A11 behind trees at a distance of around 30m-40m which is considered acceptable in terms of potential pollutant concentrations at this distance.

6.4 Further modelling and additional information on concentrations, height of receptors in relation to the road, local traffic flows etc should be conducted as part of a site suitability assessment to support an outline planning application. This would also help determine any necessary mitigation if required.

6.5 Depending on the planned energy strategy, the Proposed Development might include a number of energy centres, which have the potential to affect the local sensitive receptors.

6.6 Consideration should be given to the potential long-term operational impacts on existing and proposed receptors and any mitigation that may be needed to minimise impacts.

7. Opportunities

7.1 There are a number of opportunities to minimise the contribution that the development makes on emissions to the air. These could include the following;

- Promoting the scheme as NetZero which would have a positive impact on emissions;
- Planning extensive woodland to offset any impacts;
- Supporting a mix of land uses including facilities and services and would be self-contained thereby reducing the need to travel and minimising the number of vehicle trips;
- Creating and implement a green transport plan to encourage sustainable modes of transport including;
  - New bus services and routes including connection of First Network Norwich or Green Line Norwich to the site and bus hub on the site;
  - Improved connectivity and services at local rail stations (Spooner Row, Wymondham) and opportunities for further connection of existing tracks;
  - Provision of electric charging units on sites and car sharing facilities; and
  - Pedestrian and cycle routes towards Wymondham and links to the Norwich Pedalways network.
- Minimising impacts from emissions from energy centre(s) on the site, there is the potential to design a site-wide energy strategy that utilises modern technology to reduce emissions and optimise plant performance.

8. Conclusions

8.1 Air quality in the local area of the Site is good. There are no declared AQMAs in the District and pollutant concentrations at monitoring sites within South Norfolk District Council are all below the relevant AQS objectives.

8.2 Overall, whilst the review has identified some potential air quality constraints associated with construction impacts and exposure close to the A11, it has not identified anything that is likely to have a major effect on the evolution of the masterplan proposals.

8.3 However, due to the size of the Proposed Development, there may be the potential to affect local ambient air quality from increases in emissions associated with construction and operation as outlined above. It is therefore recommended that mitigation measures should be incorporated into the design of the proposed developments. This could include (but are not limited to), the following:

- Locating residential areas and other air quality sensitive areas away from existing or proposed sources of air pollution, including the A11 and energy generation;
- The consideration of measures for inclusion within a green travel plan to reduce road traffic emissions associated with the construction and operation of the proposed development.

8.4 In addition, to support a submission of the planning application(s), it is recommended that an Air Quality Impact Assessment should be carried out to consider the following potential effects:

- Fugitive emissions of particulate matter from construction phase activities;
- Traffic emissions associated with the construction phase;
- Emissions from road vehicles during the operational phase;
- Emissions from energy centre plant (if applicable) during the operational phase;
- Combined emissions from road traffic and energy centre; and
- Cumulative impacts.

8.5 It is recommended that the Air Quality Impact Assessment will include:

- The identification of baseline air quality conditions and nearby sensitive receptors;
- The need for any monitoring at locations close to the A11 and within the site boundary (recommended period of 3-6 months minimum);
- Consideration of any demolition and construction phase impacts on dust impacts;
- Modelling of road traffic emissions (NO_2, PM_{10} $PM_{2.5}$) using the ADMS Roads model;
- Modelling of the heating plant related emissions using the ADMS 5 model (if required);
- Site suitability assessment; and
- If required a calculation of potential cost of emission mitigations.

Appendix A Figures

Figure 1 Site Boundary (Core Site) with Air Quality Monitoring Sites and Selected Receptors

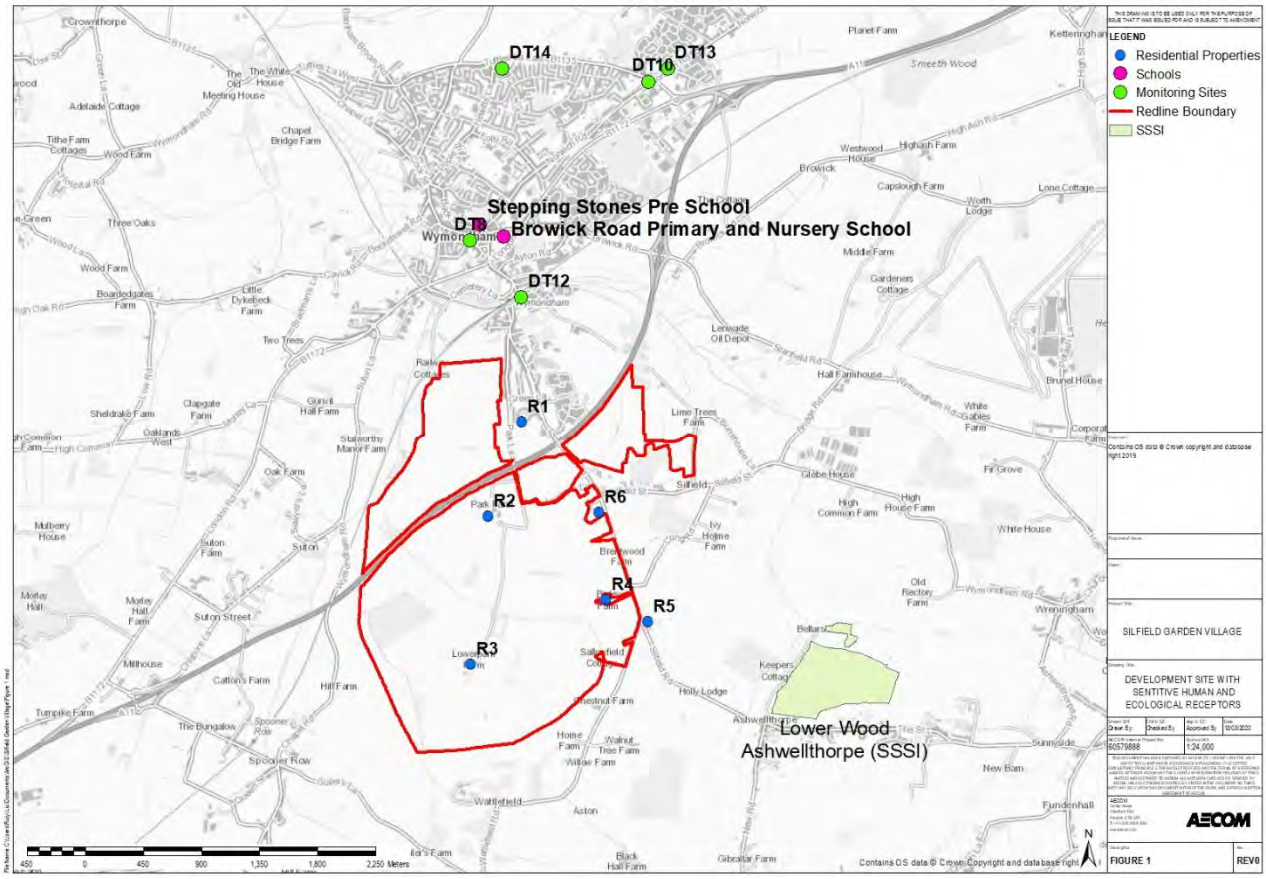


Figure 2 Mapped Background NO_2 Concentrations

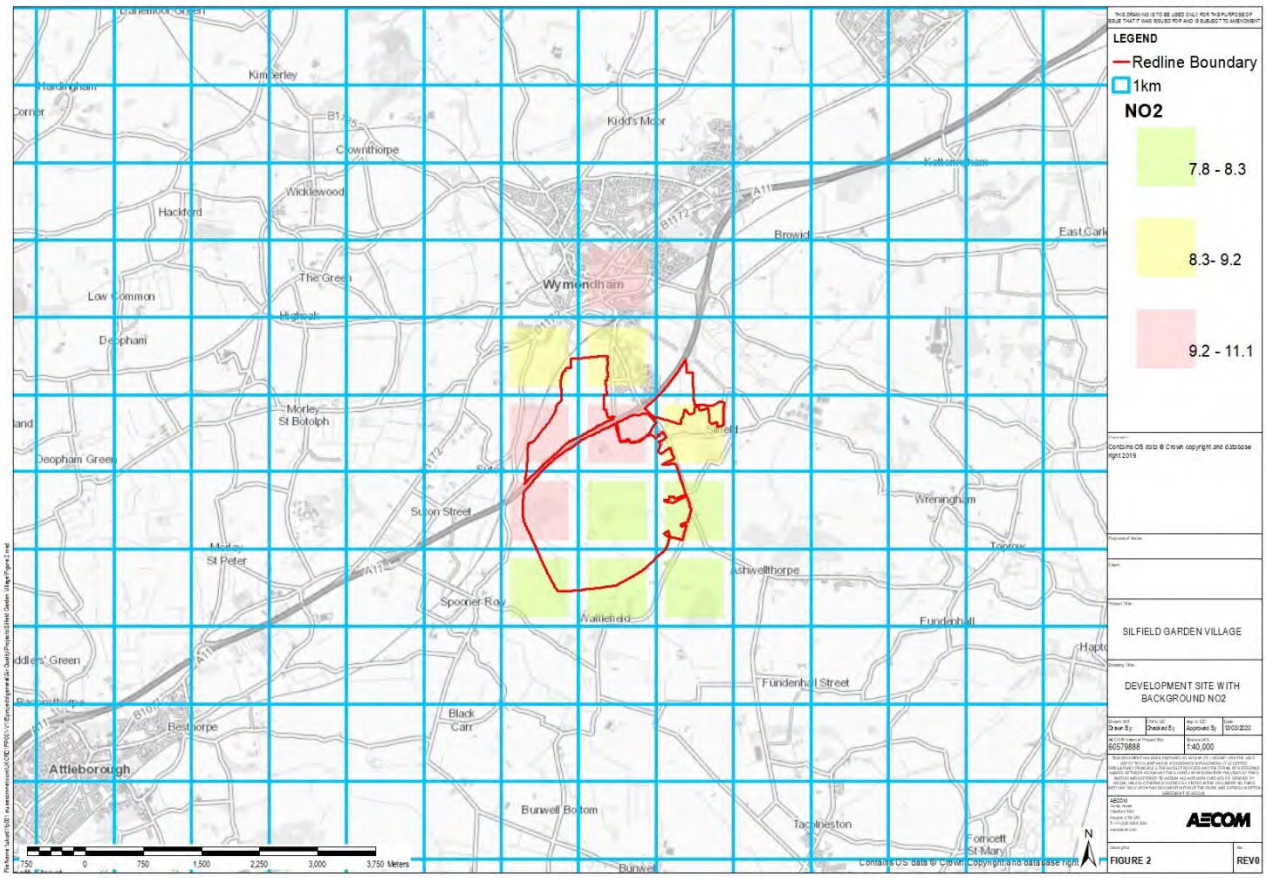
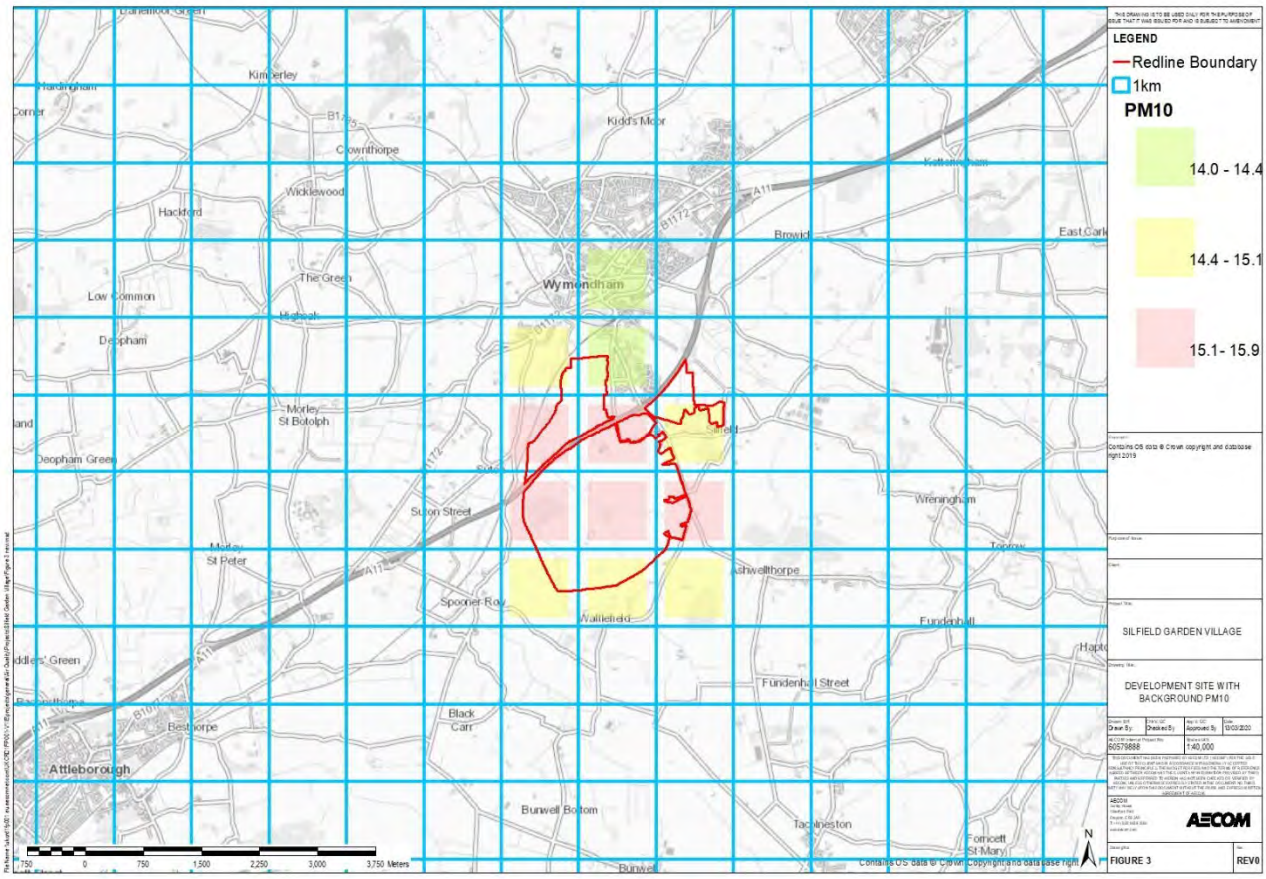


Figure 3 Mapped Background PM_{10} Concentrations



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Cultural Heritage Desk-Based Assessment (RPS)

Cultural Heritage Desk-Based Assessment (RPS)

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SILFIELD GARDEN VILLAGE, WYMONDHAM, NORFOLK

CULTURAL HERITAGE DESK-BASED ASSESSMENT

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rpsgroup.com

Quality Management

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EXECUTIVE SUMMARY

Land proposed for Silfield Garden Village at Wymondham, Norfolk has been assessed to identify any cultural heritage constraints and opportunities, in order to support its allocation for future residential development.

In terms of relevant designated heritage assets, no Scheduled Monuments or Listed buildings are located within the study site.

The Grade I-Listed and Scheduled Monument 'Abbey Church of St Mary and St Thomas of Canterbury' (Wymondham Abbey) is located 950m north of the site and represents the key heritage constraint to future development. This assessment has established that development would have an impact on its setting; however, with appropriate mitigation and design, it is believed this impact can result in less than substantial harm. The current masterplan presents opportunities to provide new public views of the Abbey both from within the residential parcels and the new public open space to the west.

There are seven Grade II listed buildings located proximate to the south and east boundaries of the site, but any impact arising from the proposed development to their significance is likely to be limited.

The study site is located in an area of archaeological interest, with evidence for land-use and settlement from the Prehistoric period onwards recorded in the wider landscape. The limited archaeological survey/investigation to date on the site itself have identified an Iron Age settlement on the route of the A11 motorway, while south of the A11 much of the land comprised a Medieval deerpark with a central moated site at Lowerpark Farm. Metal detecting has also retrieved artefacts of Prehistoric to Post Medieval origin across the fields within the site boundary. There is therefore the potential for further archaeological remains to be present.

The significance of any such remains is not yet tested, therefore it is recommended that a programme of non-invasive geophysical survey is undertaken as a primary stage of investigation, followed by trial trench evaluation, to better characterise the archaeological resource on the site. Direct development impacts on any archaeological remains can be mitigated through a combination of archaeological investigation, appropriate design measures and preservation in situ where necessary.

With respect to designated heritage assets, the NPPF directs that less than substantial harm should be weighed against the public benefits of the proposal, taking into account the statutory duty placed upon the decision maker by Section 66 of the Planning (Listed Building and Heritage Assessment Conservation Areas) Act 1990; whilst harm to non-designated assets should be taken into account when determining planning applications. The degree of harm to the identified designated and non-designated heritage assets relevant to the site, offset through a programme of sensitive design and archaeological works, should therefore be weighed against the demonstrable public benefits of the delivery of housing in Wymondham.

With appropriate mitigation measures in place, it is considered that heritage assets do not present a constraint upon the allocation of the site for residential development.

Contents

Figures

Plates

1 INTRODUCTION AND SCOPE OF STUDY

1.1 This cultural heritage desk-based assessment has been prepared by RPS group on behalf of Orbit Homes and Bowbridge Strategic Land.

1.2 The subject of this assessment, also known as the study site, comprises 451 hectares of land which lies north and south of the A11 adjacent to Wymondham in South Norfolk. The study site is centred at National Grid Reference TM 111 983 and currently comprises enclosed agricultural land set around Park Farm (Fig. 1).

1.3 In terms of relevant designated heritage assets, the Grade I listed and Scheduled Monument 'Abbey Church of St Mary and St Thomas of Canterbury' (Wymondham Abbey), is located 950m north of the study site. There are seven Grade II listed buildings located proximate to the south and east boundaries of the site.

1.4 In terms of Local designations, the study site is not located within any conservation areas as defined by South Norfolk Council.

1.5 Orbit Homes and Bowbridge Strategic Land have commissioned RPS Group to establish the cultural heritage potential of the study site, and to provide guidance on ways to accommodate any heritage constraints identified, in support of future residential allocation of the study site.

1.6 In accordance with relevant policy and guidance on archaeology and planning, and in accordance with the 'Standard and Guidance for Historic Environment Desk-Based Assessments' (Chartered Institute for Archaeologists January 2017), this assessment draws together the available archaeological, topographic and land-use information in order to clarify the archaeological potential of the site.

1.7 This desk-based assessment comprises an examination of evidence on the Norfolk Historic Environment Record (HER) and other sources. The report also includes the results of a comprehensive map regression exercise which charts the development of the study site from the 18th century until present day.

1.8 This assessment enables relevant parties to assess the significance of any designated or non-designated Cultural Heritage Assets relevant to the Study Site, assess the potential for as yet to be discovered archaeological evidence within the Study Site and enables potential impacts on Cultural Heritage Assets within the Study Area to be identified, along with the need for design, civil engineering or heritage solutions.

1.9 As the proposals progress, more detailed assessments will be required to evaluate effects on relevant heritage assets. These will include a detailed setting assessment that follows Historic England guidance *GPA3: The Setting of Heritage Assets* .

2 PLANNING BACKGROUND & DEVELOPMENT PLAN FRAMEWORK

2.1 National legislation regarding archaeology, including scheduled monuments, is contained in the Ancient Monuments and Archaeological Areas Act 1979, amended by the National Heritage Act 1983 and 2002, and updated in April 2014.

2.2 In June 2019, the government published the latest update of the National Planning Policy Framework (NPPF). The NPPF is supported by the National Planning Practice Guidance (NPPG), which was published online 6th March 2014 and last updated 22 October 2018 (https://www.gov.uk/guidance/conserving-and-enhancing-the-historic-environment).

2.3 The NPPF and NPPG are additionally supported by three Good Practice Advice (GPA) documents published by Historic England: GPA 1: The Historic Environment in Local Plans; GPA 2: Managing Significance in Decision-Taking in the Historic Environment (both published March 2015). The second edition of GPA3: The Setting of Heritage Assets was published in December 2017.

National Planning Policy

2.4 Section 16 of the NPPF, entitled Conserving and enhancing the historic environment provides guidance for planning authorities, property owners, developers and others on the conservation and investigation of heritage assets. Overall, the objectives of Section 16 of the NPPF can be summarised as seeking the:

- Delivery of sustainable development;
- Understanding the wider social, cultural, economic and environmental benefits brought by the conservation of the historic environment;
- Conservation of England's heritage assets in a manner appropriate to their significance; and
- Recognition that heritage makes to our knowledge and understanding of the past.

2.5 Section 16 of the NPPF recognises that intelligently managed change may sometimes be necessary if heritage assets are to be maintained for the long term. Paragraph 189 states that planning decisions should be based on the significance of the heritage asset and that level of detail supplied by an applicant should be proportionate to the importance of the asset and should be no more than sufficient to review the potential impact of the proposal upon the significance of that asset.

2.6 *Heritage Assets* are defined in Annex 2 of the NPPF as: a building, monument, site, place, area or landscape positively identified as having a degree of significance meriting consideration in planning decisions. They include designated heritage assets (as defined in the NPPF) and assets identified by the local planning authority during the process of decision-making or through the plan-making process.

2.7 Annex 2 also defines *Archaeological Interest* as a heritage asset which holds or potentially could hold evidence of past human activity worthy of expert investigation at some point.

2.8 A *Nationally Important Designated Heritage Asset* comprises a: World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area.

2.9 *Significance* is defined as: The value of a heritage asset to this and future generations because of its heritage interest. This interest may be archaeological, architectural, artistic or historic. Significance derives not only from a heritage asset's physical presence, but also from its setting.

2.10 *Setting* is defined as: The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.

2.11 In short, government policy provides a framework which:

- Protects nationally important designated Heritage Assets;
- Protects the settings of such designations;
- In appropriate circumstances seeks adequate information (from desk-based assessment and field evaluation where necessary) to enable informed decisions;
- Provides for the excavation and investigation of sites not significant enough to merit *in-situ* preservation.

2.12 The NPPG reiterates that the conservation of heritage assets in a manner appropriate to their significance is a core planning principle, requiring a flexible and thoughtful approach. Furthermore, it highlights that neglect and decay of heritage assets is best addressed through ensuring they remain in active use that is consistent with their conservation. Importantly, the guidance states that if complete, or partial loss of a heritage asset is justified, the aim should then be to capture and record the evidence of the asset's significance and make the interpretation publicly available. Key elements of the guidance relate to assessing harm. An important consideration should be whether the proposed works adversely affect a key element of the heritage asset's special architectural or historic interest. Additionally, it is the degree of harm, rather than the scale of development, that is to be assessed. The level of 'substantial harm' is considered to be a high bar that may not arise in many cases. Essentially, whether a proposal causes substantial harm will be a judgment for the decision taker, having regard to the circumstances of the case and the NPPF. Importantly, harm may arise from works to the asset or from development within its setting. Setting is defined as the surroundings in which an asset is experienced and may be more extensive than the curtilage. A thorough assessment of the impact of proposals upon setting needs to take into account, and be proportionate to, the significance of the heritage asset and the degree to which proposed changes enhance or detract from that significance and the ability to appreciate it.

2.13 In considering any planning application for development, the planning authority will be mindful of the framework set by government policy, in this instance the NPPF, by current Development Plan Policy and by other material considerations.

Local Planning Policy

2.14 The relevant Local Development Framework (LDF) is currently provided by the Joint Core Strategy for Broadlands, Norwich and South Norfolk that was adopted in March 2011 with amendments in January 2014 and contains the following relevant policy:

POLICY 1: ADDRESSING CLIMATE CHANGE AND PROTECTING ENVIRONMENTAL ASSETS

THE BUILT ENVIRONMENT, HERITAGE ASSETS, AND THE WIDER HISTORIC ENVIRONMENT WILL BE CONSERVED AND ENHANCED THROUGH THE PROTECTION OF BUILDINGS AND STRUCTURES WHICH CONTRIBUTE TO THEIR SURROUNDINGS, THE PROTECTION OF THEIR SETTINGS, THE ENCOURAGEMENT OF HIGH-QUALITY MAINTENANCE AND REPAIR AND THE ENHANCEMENT OF PUBLIC SPACES.
POLICY 8: CULTURE, LEISURE AND ENTERTAINMENT

THE CULTURAL OFFER IS AN IMPORTANT AND VALUED PART OF THE AREA. EXISTING CULTURAL ASSETS AND LEISURE FACILITIES WILL BE MAINTAINED AND ENHANCED. THE DEVELOPMENT OF NEW OR IMPROVED FACILITIES INCLUDING THOSE SUPPORTING THE ARTS, STREET EVENTS, CONCERTS AND THE CREATIVE INDUSTRIES SECTOR WILL BE PROMOTED.

CULTURAL HERITAGE WILL BE ENRICHED THROUGH USE OF INNOVATIVE DESIGN AND ART IN THE PUBLIC REALM.

DEVELOPMENT WILL BE EXPECTED TO PROVIDE FOR LOCAL CULTURAL AND LEISURE ACTIVITIES, INCLUDING NEW OR IMPROVED BUILT FACILITIES, PROVIDE FOR A RANGE OF ACTIVITIES INCLUDING PERFORMANCE SPACE, AND/OR ACCESS TO GREEN SPACE, INCLUDING FORMAL RECREATION, COUNTRY PARKS AND THE WIDER COUNTRYSIDE.

2.15 The South Norfolk Local Plan Development Management Policies Document (October 2015) set out the following policies relating to historic environment:

POLICY DM 4.10 HERITAGE ASSETS

ALL DEVELOPMENT PROPOSALS MUST HAVE REGARD TO THE HISTORIC ENVIRONMENT AND TAKE ACCOUNT OF THE CONTRIBUTION WHICH HERITAGE ASSETS MAKE TO THE SIGNIFICANCE OF AN AREA AND ITS SENSE OF PLACE, AS DEFINED BY REFERENCE TO THE NATIONAL AND LOCAL EVIDENCE BASE RELATING TO HERITAGE. CHANGE OF USE, ALTERATIONS AND EXTENSIONS AFFECTING THE SIGNIFICANCE OF A DESIGNATED HERITAGE ASSET, INCLUDING ITS SETTING, MUST HAVE REGARD TO AND POSITIVELY RESPOND TO, THAT SIGNIFICANCE. PROPOSALS MUST SUSTAIN, AND WHERE POSSIBLE ENHANCE AND BETTER REVEAL THE SIGNIFICANCE OF THE ASSET AND MAKE A POSITIVE CONTRIBUTION TO LOCAL DISTINCTIVENESS.

PROPOSALS MUST SHOW HOW THE SIGNIFICANCE OF THE HERITAGE ASSET HAS BEEN ASSESSED AND TAKEN INTO ACCOUNT BY REFERENCE TO THE HISTORIC ENVIRONMENT RECORD, SUITABLE EXPERTISE AND OTHER EVIDENCE/RESEARCH AS MAY BE NECESSARY.

CONSIDERABLE IMPORTANCE AND WEIGHT MUST BE GIVEN TO THE DESIRABILITY OF PRESERVING LISTED BUILDINGS, THEIR SETTINGS AND THE CHARACTER AND APPEARANCE OF CONSERVATION AREAS. DEVELOPMENT SHOULD AVOID CAUSING ANY LOSS TO A HERITAGE ASSET, OR HARM TO IT. SUBSTANTIAL HARM OR TOTAL LOSS WILL ONLY BE JUSTIFIED WHERE IT CAN BE DEMONSTRATED THAT IT IS NECESSARY TO ACHIEVE SUBSTANTIAL BENEFITS OR WHERE THE RETENTION OF THE ASSET IS UNSUSTAINABLE, NO VIABLE ALTERNATIVES CAN BE IDENTIFIED AND THE HARM OR LOSS IS OUTWEIGHED BY THE BENEFITS OF BRINGING THE SITE BACK INTO USE. LESS THAN SUBSTANTIAL HARM WILL ONLY BE JUSTIFIED WHERE THERE ARE PUBLIC BENEFITS THAT OUTWEIGH THE HARM. IN CARRYING OUT THIS PLANNING BALANCE, LESS THAN SUBSTANTIAL HARM WILL BE AFFORDED CONSIDERABLE IMPORTANCE AND WEIGHT. PROPOSALS WHICH ADVERSELY AFFECT THE SIGNIFICANCE OF A HERITAGE ASSET WILL ONLY EXCEPTIONALLY BE PERMITTED WHERE CLEAR AND CONVINCING JUSTIFICATION IS PROVIDED.

POLICY DM 2.12 TOURIST ACCOMMODATION

…

(4) IN ALL CASES OF PROPOSALS FOR THE CHANGE OF USE OF LAND, PARTICULAR CONSIDERATION WILL BE GIVEN TO:

C) THE PROPOSED ONGOING MANAGEMENT OF THE SITE TO PROTECT THE AMENITY OF THE LOCALITY AND PROTECT NATURE CONSERVATION, LANDSCAPE AND ARCHAEOLOGICAL VALUE; AND

D) ENSURING THAT GOOD QUALITY AGRICULTURAL LAND IS NOT TAKEN OUT OF PRODUCTION.

2.16 In terms of relevant designated heritage assets, the Grade I-Listed and Scheduled Monument 'Abbey Church of St Mary and St Thomas of Canterbury' (Wymondham Abbey- ref: 1003992/386100), is located 950m north of the study site. A further seven 7 Grade II listed buildings are located proximate to the south and east boundaries of the site that may be affected by the proposed allocation (Fig. 2a).

2.17 In terms of Local designations, the study site is not located within any conservation areas as defined by South Norfolk Council.

2.18 In line with relevant planning policy and guidance, this desk-based assessment seeks to clarify the site's cultural heritage potential, likely direct and indirect effects from future development on the site and the need or otherwise for additional mitigation measures.

3 GEOLOGY AND TOPOGRAPHY

Geology

3.1 The British Geology Survey (BGS Online 2019) records the underlying geology of the site as Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation and Culver Chalk Formation. The overlying superficial deposits are Lowestoft Formation diamicton, except in the location of a tributary stream crossing the site where Alluvium (Clay, Silt, Sand And Gravel) is recorded.

3.2 No geotechnical data is currently available for the study site.

Topography

3.3 The study site is located on a west-facing river valley slope that rises very gently from approximately 35m Above Ordnance Datum (AOD) at its western boundary to approximately 57m AOD at its eastern boundary (Fig. 3b; Plates 1-6).

3.4 A tributary stream crosses the study site, draining into the Bays River that flows northwards along the western site boundary. In turn, the Bays River drains into the River Tiffey that flows westwards through Wymondham.

4 ARCHAEOLOGICAL ASSESSMENT

Timescales:

Prehistoric

Palaeolithic	900,000	-	12,000 BC
Mesolithic	12,000	-	4,000 BC
Neolithic	4,000	-	2,500 BC
Bronze Age	2,500	-	800 BC
Iron Age	800	-	AD 43

Historic

Roman	AD 43	-	410
Saxon/Early Medieval	AD 410	-	1066
Medieval	AD 1066	-	1485
Post Medieval	AD 1486	-	1799
Modern	AD 1800	-	Present

Introduction

4.1 This chapter provides a summary review of the available archaeological evidence for the study site and the archaeological/historical background of the general area, and, in accordance with NPPF, considers the potential for any as yet to be discovered archaeological evidence on the study site.

4.2 What follows comprises a review of known archaeological assets within a 1km radius of the study site (Figs. 1 & 2), also referred to as the study area, held on the Norfolk Historic Environment Record (HER), together with a historic map regression exercise charting the development of the study area from the 18th century onwards until the present day.

4.3 In terms of Local designations, the study site is not located within any conservation areas as defined by South Norfolk District Council.

4.4 The study site is generally recorded as `20th century agriculture` on the Norfolk Historic Landscape Characterisation database.

Designated Assets

4.5 In terms of relevant designated archaeological assets, no World Heritage Sites, Scheduled Monuments or Historic Battlefields are located on the study site (Fig. 2b).

4.6 The Abbey Church of St Mary and St Thomas of Canterbury (Wymondham Abbey) is located 950m north of the study site (Fig. 2a- ref: 1003992/386100). The Benedictine Abbey Church site was

originally founded in 1107 by William d'Aubigny as a priory, before being granted the right to become an abbey in 1448. The extant, twin-towered abbey buildings are Grade I listed, while the wider grounds that contain surface and sub-surface remains of earlier structures are designated as a Scheduled Monument. An assessment of the effects of development on the study site to the setting of the Grade I listed abbey building is presented in the Built Heritage Assessment chapter (5) below.

Previous Archaeological Work

4.7 There has been very little invasive archaeological fieldwork carried out on the study site. On the basis of surface finds identified during fieldwalking in 1990 and 1993 by Norfolk Archaeology Unit, subsequent excavations identified the presence of an Iron Age settlement and/or industrial site on the route of the A11 carriageway (Fig. 2c; ENF98773). Features excavated included pit groups, four-post structures, quarries, and evidence for bone or antler working. Other industrial activities were also noted, comprising flint working, iron smelting, and the quarrying of natural boulder clay.

4.8 Fieldwalking and metal detecting has been undertaken across the study site sporadically since the late 20th century and recovered a wide array of multi-period finds, extending from the Prehistoric to Modern eras.

4.9 Aerial photographs of the study site have also been reviewed as part of the National Mapping Programme (NMP) for Norfolk, which has been mapping potential archaeological sites in Norfolk since 1991. The NMP has identified a number of linear cropmarks within the study site indicative of Prehistoric and historic activity; concentrated on its northern and eastern fringes (Fig. 2c).

Archaeological Potential

4.10 The lack of invasive archaeological investigation on the study site limits an analysis of its archaeological potential, however the fieldwork and metal detecting to date indicates a general level of activity from most past periods of human activity. The following provides key findings by period.

Prehistoric

4.11 The earliest finds recorded from the study site are Mesolithic blades, a blade core and core burin recovered during the A11 excavation (Fig. 2b- MNF25887). As noted above, the excavation also identified an Iron Age settlement/industrial site . The remaining evidence for Prehistoric activity derives from cropmarks recorded via the NMP, along with fieldwalking and metal-detected finds.

4.12 Cropmarks of note are those of two possible ring ditches, which could represent the remains of Bronze Age round barrows, located in the northern and northeastern portions of the study site (Fig. 2b- MNF63764 & MNF63765).

4.13 The fieldwalking and metal-detected finds include an array of pottery and metal artefacts that indicate Prehistoric activity took place on the study site, but the nature of their recovery does not allow for greater than field-wide accuracy in identifying potential settlement/activity zones.

4.14 There is therefore known Prehistoric settlement activity on the site, and the available evidence suggests a moderate potential for further remains to be present.

Roman

4.15 Various Roman artefacts have been retrieved from the study site through fieldwalking and metal detecting, but no direct evidence of settlement has been recorded.

4.16 Roman material often appears in HERs because of the volume of cultural material relative to most other periods and because much of that material is readily identifiable. There is not sufficient evidence to establish if the finds retrieved from the site represent a “background noise” of general activity in the wider landscape, or directly derive from settlement within the site. On balance, there is a low to moderate potential for such remains to be present.

Saxon & Medieval

4.17 Anglo-Saxon finds have been retrieved from the study site through fieldwalking and metal detecting, but no direct evidence of settlement has been recorded.

4.18 The majority of the study site to the south of the A11 comprised a Medieval deer park established by William d’Aubigny II, with some assistance from the monastery in Wymondham. The park covered 200 hectares and measured 2km from north to south. The park was known as Oxehaghe, and the eastern boundary is still visible as cropmarks in some places (Fig. 2c- 9945).

4.19 At Lower Park Farm, located centrally within the deer park footprint, are the remains of a moat that may have sited a hunting lodge and manor house for the d’Aubignys (Fig. 2b-MNF9944; Plates 5 & 6).

4.20 Cropmarks indicating a series of building platforms and field boundaries are also located on the eastern edge of the deer park (Fig. 3c; 57364). It is thought that these date to the Medieval period and are likely related to common-edge enclosures and settlement.

4.21 A further concentration of cropmarks of former enclosures, fields and boundaries of probable Medieval date is present in the northeastern part of the study site (Fig. 3c; 17143, 54689, 54690, 54702, 54687, 54707).

4.22 Medieval finds have also been recovered during fieldwalking and metal detecting across the fields within the study site.

4.23 There can be considered an overall moderate potential for further significant remains from these periods to be present. The potential is raised around the Lower Park Farm moat and the cropmark concentrations in the northeastern part of the site.

Post Medieval & Modern

4.24 The cropmarks concentrations on the site noted above in the northern and eastern portions of the site may also incorporate Post Medieval settlement remains.

4.25 Activity at the Lower Park moated site would also have continued throughout these periods, with the current phase of buildings seemingly dating from the late 18th century. Park Farm to the north was established by the late 18th century (Plate 6).

4.26 Our understanding of settlement and utilisation of the study site and wider landscape during these periods is enhanced by cartographic and documentary evidence.

4.27 The earliest map reviewed for this assessment, the 1797 Faden Map (Fig. 4), shows the study site as predominantly open land set around the 'Park Farm' farmsteads, with trackways providing routes between the farms and extending north and eastwards. 'Sinfield Common' is labelled in the eastern portion of the site. The buildings at the eastern site boundary likely represent extant structures that have been specifically excluded from the site.

4.28 Subsequent mapping and satellite imagery (Figs. 5-12) shows that the character of the site has changed little over ensuing centuries up to the present day, aside from revisions to field boundaries and areas of woodland.

4.29 Based on the above, a generally low archaeological potential for significant remains can be determined for these periods at the study site. Evidence of demolished farmstead buildings, former field boundaries and agricultural activity may be present.

Assessment of Significance

4.30 Existing national policy guidance for archaeology (the NPPF as referenced in section 2) enshrines the concept of the 'significance' of heritage assets. Significance as defined in the NPPF centres on the value of an archaeological or historic asset for its 'heritage interest' to this or future generations.

4.31 The currently known archaeological assets within the study site can be considered of local to regional significance.

4.32 The evidence to date derived from the HER, LiDAR data and other relevant sources does not suggest the presence of currently unrecorded archaeological remains on the site of a significance that would prohibit or constrain development. They would, in the context of the Secretary of State's non-statutory criteria for Scheduled Monuments (DCMS2013), most likely be of local to regional significance.

4.33 In accordance with the NPPF and Local Planning policies, it is considered that the archaeological interest in the site as a whole can be appropriately safeguarded through staged mitigation. The most appropriate first stage of mitigation, in order to refine the baseline and understand any elevated risk associated with the masterplan, would be to undertake a programme of geophysical survey which would be followed by targeted trial trenching.

5 BUILT HERITAGE ASSESSMENT

Introduction

5.1 There are no designated heritage assets (scheduled monuments, listed buildings, conservation areas, registered parks and gardens) located within the site (Fig. 2a). However, the Norfolk Historic Environment Record identifies two historic farmsteads: Park Farm and Lower Park Farm within the site. These farmsteads comprise a range of buildings and may be considered as non-designated heritage assets by the local planning authority through the allocation process. Initial assessment has been provided by David Lock Associates, with more detailed consideration given to these buildings below.

5.2 In addition, there are a number of listed buildings within the vicinity of the site. This includes 7 Grade II listed buildings located proximate to the south and east boundaries of the site that may be affected by the proposed allocation and which are considered below. However, the key built heritage constraint is likely to be the presence of the Abbey Church of St Mary and St Thomas of Canterbury (Wymondham Abbey), a Grade I listed with a broad setting. This building sits in an elevated position within Wymondham and is visible from most of the northern part of the site (the land north of the A11). Its high significance, and prominent setting, means that it represents a key constraint and the design of the proposed development must give due regard to the setting and significance of this heritage asset.

5.3 The following section provides an initial assessment of the significance of all built heritage assets potentially affected by the proposed development. In accordance with Historic England guidance in GPA3: The Setting of Heritage Assets it assesses their significance, with consideration given to how, and to what extent, their settings contribute to that significance. This allows the heritage constraints and opportunities presented by the site to be understood and has informed the constraints heat map at Appendix 1. All designated heritage assets are identified in Figure 2a of this report and identified below:

- The Abbey Church of St Mary and St Thomas of Canterbury Grade I; NHLE 1297494)
- Silfield Old Hall (Grade II; NHLE 1297512)
- Mariners Inn (Grade II; NHLE 1297513)
- Chestnut Farmhouse (Grade II; NHLE 1196724)
- Wattlefield Hall and associated Barn and Stables (Grade II; NHLE 1196725, NHLE 1208316 and NHLE 1196726)
- Park Farm (non-designated)
- Lower Park Farm (non-designated)

Assessment of Significance

Wymondham Abbey

5.4 The Abbey Church of St Mary and St Thomas of Canterbury was founded in 1107 as a Benedictine Abbey. It retains some Norman fabric but has undergone substantial alterations in the 14th and 15th centuries. It was substantially demolished following the Dissolution of the Monasteries in the 16th century, presenting the unusual form that is now experienced of a nave with a tall west tower and a slender, former crossing tower marking the east end.

5.5 The building is located on a slightly raised site above the valley of the River Tiffey and much of the surrounding countryside. The generally flat topography surrounding Wymondham means that long-distance views are afforded of the building from the surrounding countryside, with the two towers a distinctive landmark, clearly visible on the skyline from the local area. This surrounding countryside would have historically provided much of the wealth for the Abbey, while the elevated location was likely chosen to provide a prominent setting for the building. Its high visibility and link with the surrounding landscape is therefore an important element of the listed building's setting which contributes to both the architectural and historic interest of the Abbey.

5.6 The site is located approximately 950 metres south of the Abbey at its nearest point. Although there is intervening built form and vegetation the local topography means that clear views are provided of both the west tower and crossing tower from the northern field parcels of the site (the land north of the A11). The towers form a prominent landmark and are frequently experienced alongside one another from this land. Although planting partly obscures some views, the site does allow for an experience of the abbey from within its wider agricultural hinterland. This element of the site is therefore considered to contribute to the significance of the listed building and careful consideration must be given to the form, location and layout of any development here. The remainder of the site is visually distinct and its development is unlikely to affect the significance of Wymondham Abbey.

5.7 The Abbey is also located within the Wymondham Conservation Area, itself a designated heritage asset. However, the towers of the listed building are the only visible elements of the conservation area from the site and therefore the proposed allocation will not affect the significance of the wider conservation area.

Silfield Old Hall

5.8 The Old Hall is a large house of mid-17th century origins which was altered in the later 17th century to provide the current cruciform plan. Further alterations were undertaken in the 20th century when the building was divided into 2 dwellings. It is a timber-framed construction, finished in brick and weatherboarding and has a mixture of fenestration. The building is an important example of local, post-medieval vernacular, executed on a grand scale, and the building possesses historic and architectural interest.

5.9 Silfield Old Hall now has an enclosed and clearly defined immediate setting, comprising its large garden plot and driveway. This plot is bound by Silfield Road to the east and Verdon's Lane to the south, with all boundaries defined by dense, mature planting. This immediate setting reflects the significance of the building as a large gentry house. However, it does provide visual enclosure, even

in winter months, and means there is little visual connection with the surrounding agricultural land, including the site.

5.10 The site lies immediately outside of these private grounds to the northwest and southwest. Despite the proximity, views of the listed building are restricted by the surrounding planting and there is little, to no appreciation of the architectural interest of the listed building from the majority of the site. However, the site does provide the wider rural context to the listed building and reflects its historic isolation, contributing to the historic interest of Silfield Old Hall and making a limited contribution to its overall significance.

Mariners Inn

5.11 The Mariners Inn was originally constructed as a public house in the 17th century, before being converted to residential use in the late 20th century. The building includes a 2-storey range with a long single-storey range to the north which was added in the 19th century, possibly as stabling. Although the building is set well back from Silfield Road, its principal east elevation looks towards the road and this connection would have historically been important with the public house capitalising on passing trade. The change of use of the building has led to a more domesticated appearance both to the building and this immediate setting, which is now largely enclosed on all sides, limiting the visibility of the building from the public realm.

5.12 The site is located to the north, south and west of the listed building's immediate grounds, although views of it are limited by the intervening planting which forms the boundaries of the grounds. These views and the rural context provided by the site make a limited contribution to the building's significance, particularly when considering the building's principal historic use as a public house and its consequent relationship with the road to the east.

Chestnut Farmhouse

5.13 Chestnut Farmhouse was constructed in the early eighteenth century. It is a 2-storey red-brick building of 3 bays. The building possesses historic interest as an agricultural building constructed during the agricultural revolution in England, with additional architectural interest provided by its simple, yet elegant façade.

5.14 The building is located within an enclosed farmyard, with ancillary buildings to the southwest and a small cottage to the northeast. The private garden is enclosed by planting, although a visual relationship with the historic barns to the southwest is provided. These buildings demonstrate the historic role of the listed building and contribute to its significance as an 18th century agricultural building.

5.15 The surrounding buildings and planting do, however, restrict views from the farmhouse to the surrounding land. The site forms part of the historic landholding of the farm and therefore provides important rural context which contributes to its historic interest, with those parts of the site in closest proximity of the building considered to positively contribute to the farmhouse's significance. Care should therefore be given to the development of this eastern extent of the site.

Wattlefield Hall, Barn and Stables

5.16 Wattlefield Hall was originally constructed in the late e18th century, before being remodelled and extended in the 19th century. It is a grand building, incorporating a neo-Elizabethan frontage and possesses architectural, including artistic, interest and historic interest. The Barn and Stables are separately listed and were constructed in the late 18th and early 19th centuries respectively. The buildings together form a coherent group representing a gentry house and ancillary buildings. Their settings are overlapping and the buildings share group value, with each of them contribution to the significance of the others. The buildings are located in an isolated area, and are set within substantial grounds surrounded by planting. A Lodge building is located to the east at the junction between the private approach road and Wattlefield Road. This building, which is also constructed in a neo-Tudor style further contributes to the significance of Wattlefield Hall by reflecting its historic use as a grand, country residence.

5.17 The wider setting of the buildings includes the surrounding agricultural land, parts of which form the historic landholding of the house and comprise the wider manor. Although the link between the buildings and this agricultural land has now ceased, it continues to provide rural context and contributes to their historic interest.

5.18 Views of the buildings from the site are limited by intervening planting, while the buildings are now experienced as well-contained and isolated. The site makes a very limited contribution to their significance as part of the wider rural surrounds.

Park Farm

5.19 Park Farm was originally developed in the late 18th or early 19th century. It now comprises a large farmhouse, set to the north within a now domesticated setting, and a much-altered farmyard to the south. This includes a flint and red-brick granary and barn, which is now incorporated into a much larger structure, but retains significance. The remaining buildings date form the 20th century and are of no architectural or historic interest. Together the pre-20th century building represent a farmyard of some grandeur and possess historic interest and, to a lesser extent, architectural interest.

5.20 The buildings together are likely to be considered by the local planning authority as non-designated heritage assets and the retention of these historic elements, coupled with the demolition of the later unsympathetic additions, is encouraged.

5.21 The setting of the farmyard has also been much altered in the 20th century, although the views form the farmhouse to the west retain a sense of its agricultural and rural setting, while also allowing the architectural interest of the building to be experienced.

Lower Park Farm

5.22 The current buildings at Lower Park Farm appear to date from the late 18th century, and likely replaced an earlier farmstead within this moated site. The buildings comprise a large barn and a smaller series of buildings arranged around a modest courtyard. They are constructed of timber framing, with brick and some flint used. Every building has seen considerable alteration recently, with the reconstruction

of the upper stages, including roof, of the Barn, while the other buildings have been rebuilt, with a 2-storey range added to them.

5.23 Despite these changes the buildings remain recognisable as a post-medieval farmyard and they retain limited significance, including historic interest. Their retention is encouraged and there should be opportunities to convert the buildings to residential or community uses and retained as part of the proposed development.

6 PROPOSALS AND DESIGN RESPONSE

6.1 The purpose of this section is to identify any notable heritage opportunities and constraints, discuss the current masterplan and how it responds to the settings and significance of the relevant heritage assets assessed in Section 4 and 5 of this report.

6.2 The key built heritage constraint is the presence of Wymondham Abbey, with views of this prominent, Grade I listed building permitted from most of the northern section of the site. It will therefore be important to integrate this building with the proposed development, by retaining views where possible and softening the visual impact of the proposed dwellings through the strengthening of existing tree belts and provision of open space within the site.

6.3 The current masterplan (Fig. 13) retains much of the northern area of the site as formal and informal open space, including open space within the schools, playing fields and the river parkland. This will retain a number of views towards the listed building from this area of the site, with the prominence of the Abbey retained. The built form within the northern field parcel, which includes school buildings and residential development, is concentrated to the east adjacent to existing built form. This will minimise the visual impact of the proposed development and ensure it relates more strongly to the existing built form, rather than the more open, rural setting provided by the land to the west.

6.4 The proposed allocation and subsequent development of the site will alter views to the Abbey from within the site and the neighbouring Silfield Road. Although this will limit the experience of the Abbey and slightly reduce its wider rural setting, any impact to the overall significance of the listed building would remain limited and 'less than substantial' in magnitude. As the design process evolves there will also be opportunities to maintain and direct views to the Abbey through the careful alignment of built form, open spaces and roads. This will assist in maintaining views of the Abbey which can be used as a focal point of the new development.

6.5 The remainder of the surrounding designated heritage assets are generally well-screened in views from the site due to their enclosed, well-treed settings. They do not therefore present as strong constraints to development although the current masterplan includes measures to strengthen this existing planting and minimise the visual impact of the proposed development. The proposals will also lead to the loss of some rural context, but any impact arising from the proposed development to their significance is likely to be limited, especially if a development buffer and additional planting is provided.

6.6 The redevelopment of land surrounding Park Farm offers important opportunities for enhancement. The farmstead has seen considerable development during the 20th century, including the subsuming of the historic granary within a much larger structure, while later buildings have altered the relationship with the principal farmhouse. The demolition of these 20th century agricultural structures, which are of no architectural or historic interest is encouraged and would provide opportunities for enhancement. The construction of replacement buildings in an agricultural style, utilising flint and red brick, will help to replicate the historic farmyard and allow the historic use of the principal farmhouse and wider farmyard to be experienced. However, further development immediately surrounding the farmyard,

particularly to the west and northwest should be restricted to maintain the views from the building and its immediate, now domesticated setting.

6.7 Lower Park Farm should also be retained and integrated into the new development. Although the buildings have seen considerable recent redevelopment, the layout of the farmstead and surviving 18th century fabric means they retain significance. The moat provides a clear enclosed setting which allows the historic function and relationship of the different buildings within the farmyard to be experienced. An offset of development around this should be retained to maintain views to and from the farmyard and some of the surrounding agricultural land.

6.8 This assessment has also established that, in terms of below-ground archaeology, the evidence to date does not indicate remains of a significance that would prohibit development are present on the site. The current masterplan indicates there is potential for localised direct development impacts on archaeological remains (Fig. 14), however these can be mitigated through a combination of archaeological investigation, appropriate design measures and preservation in situ where necessary.

6.9 Such measures can contribute to the place-making of any future development and assist in developing its historical narrative. In addition, there will be an opportunity to enhance heritage assets on the site (e.g. the Lower park moat) through dissemination of the additional data retrieved from archaeological investigation.

7 CONCLUSIONS

7.1 Land proposed for Silfield Garden Village at Wymondham, Norfolk has been assessed to identify any cultural heritage constraints and opportunities, in order to support its allocation for future residential development.

7.2 In terms of relevant designated heritage assets, no Scheduled Monuments or Listed buildings are located within the study site.

7.3 The Grade I-Listed and Scheduled Monument 'Abbey Church of St Mary and St Thomas of Canterbury' (Wymondham Abbey) is located 950m north of the site and represents the key heritage constraint to future development. This assessment has established that development would have an impact on its setting; however, with appropriate mitigation and design, it is believed this impact can result in less than substantial harm.

7.4 There are seven Grade II listed buildings located proximate to the south and east boundaries of the site, but any impact arising from the proposed development to their significance is likely to be limited.

7.5 The study site is located in an area of archaeological interest, with evidence for land-use and settlement from the Prehistoric period onwards recorded in the wider landscape. The limited archaeological survey/investigation to date on the site itself have identified an Iron Age settlement on the route of the A11 motorway, while south of the A11 much of the land comprised a Medieval deerpark with a central moated site at Lowerpark Farm. Metal detecting has also retrieved artefacts of Prehistoric to Post Medieval origin across the fields within the site boundary. There is therefore the potential for further archaeological remains to be present.

7.6 The significance of any such remains is not yet tested, therefore it is recommended that a programme of non-invasive geophysical survey is undertaken as a primary stage of investigation, followed by trial trench evaluation, to better characterise the archaeological resource on the site. Direct development impacts on any archaeological remains can be mitigated through a combination of archaeological investigation, appropriate design measures and preservation in situ where necessary.

7.7 With respect to designated heritage assets, the NPPF directs that less than substantial harm should be weighed against the public benefits of the proposal, taking into account the statutory duty placed upon the decision maker by Section 66 of the Planning (Listed Building and Heritage Assessment Conservation Areas) Act 1990; whilst harm to non-designated assets should be taken into account when determining planning applications. The degree of harm to the identified designated and non-designated heritage assets relevant to the site, offset through a programme of sensitive design and archaeological works, should therefore be weighed against the demonstrable public benefits of the delivery of housing in Wymondham.

7.8 With appropriate mitigation measures in place, it is considered that heritage assets do not present a constraint upon the allocation of the site for residential development.

Sources Consulted

General

British Library

Norfolk Historic Environment Record

The National Archive

Internet

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Cartographic

1797 Faden Map

1818 Ordnance Survey Drawing

1839 Wymondham Tithe Map

1882 Ordnance Survey Map

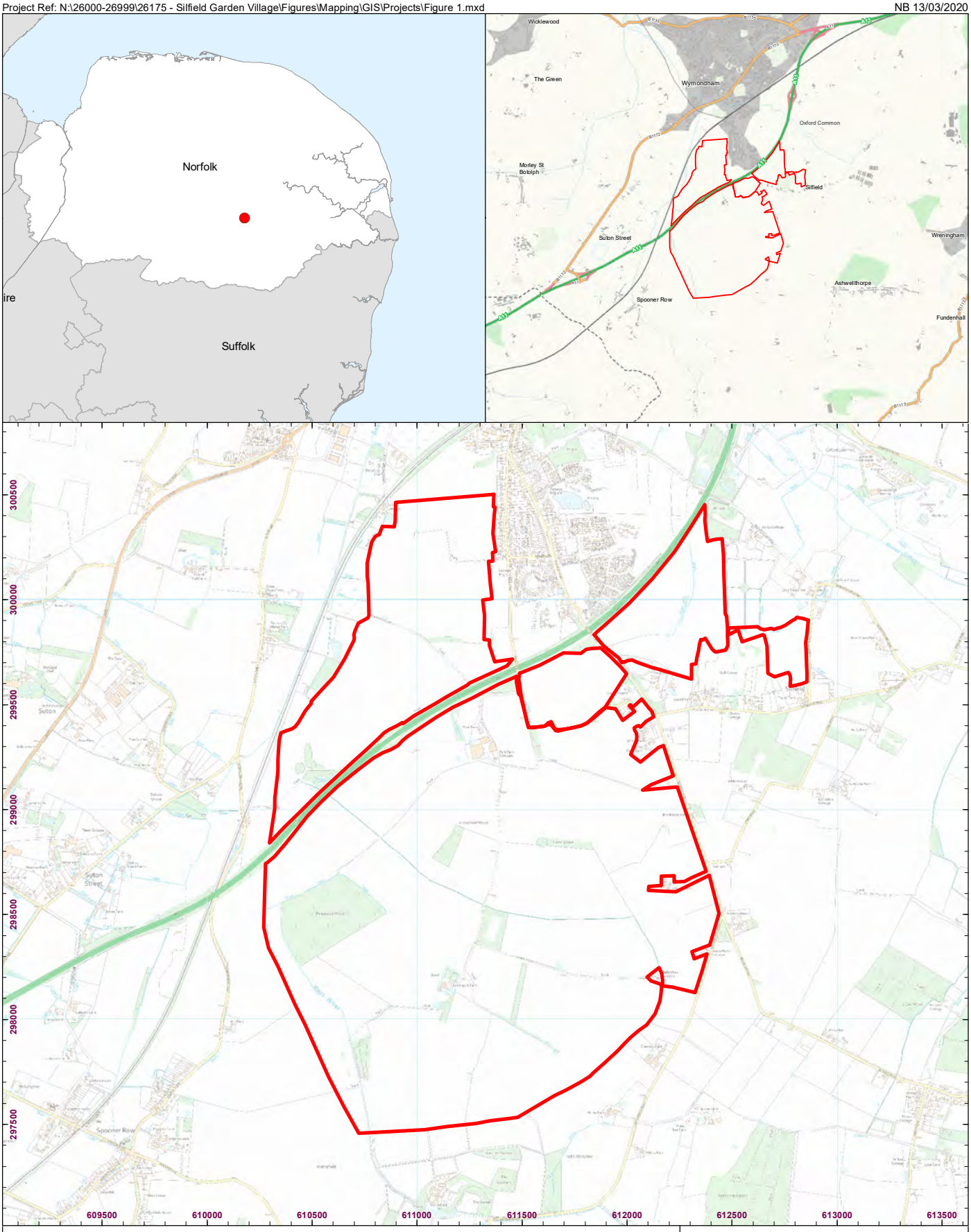
1905-07 Ordnance Survey Map

1950 Ordnance Survey Map

1977 Ordnance Survey Map

2001 Ordnance Survey Map

2019 Aerial Photograph (Google Earth)



Site Boundary

N

0 200 400 600m

Scale at A4: 1:25,000

MAKING COMPLEX EASY

Figure 1

Site Location

NB 13/03/2020

1003991
Market cross

1003992
Wymondham Abbey

1

2

Legend

Site Boundary

1km search radius

Designated Heritage Assets:

Listed Buildings

Grade

Grade I Listed Building

Grade II Listed Building

Scheduled Monuments

Conservation Areas

Wymondham

Wymondham, The Lizard

N

0 200 400m

Scale at A3: 1:20,000

MAKING COMPLEX EASY

Figure 2a

Designated Heritage Assets

Project Ref: N:\26000-26999\26175 - Silfield Garden Village\Figures\Mapping\GIS\Projects\Figure 2a DHA.mxd

NB 13/03/2020

MNF39948 MNF17109 MNF61117 MNF9446 MNF62248 MNF65910 MNF9437 MNF62254 MNF33723 MNF39049 MNF22959 MNF33069 MNF62548 MNF65115 MNF61910 MNF56324 MNF9431 MNF57304 MNF16660 MNF13588 MNF13580 MNF40852 MNF58556 MNF33724 MNF58602 MNF31470 MNF28153 MNF65073 MNF16659 MNF58603 MNF58569 MNF62762 MNF65072 MNF65071 MNF30569 MNF68244 MNF25510 MNF64560 MNF13571 MNF58604 MNF64214 MNF42073 MNF55147 MNF33079 MNF66243 MNF25890 MNF63864 MNF63557 MNF63863 MNF42045 MNF66866 MNF18384 MNF17144 MNF63768 MNF25885 MNF63865 MNF63866 MNF25886 MNF17143 MNF62763 MNF63764 MNF65978 MNF63862 MNF66543 MNF39047 MNF63867 MNF63767 MNF66867 MNF64872 MNF63765 MNF25887 MNF9945 MNF65979 MNF63853 MNF25888 MNF63766 MNF42065 MNF63560 MNF41774 MNF65639 MNF14381 MNF40450 MNF63852 MNF63854 MNF66306 MNF69244 MNF39048 MNF63769 MNF25889 MNF66307 MNF9943 MNF69171 MNF25884 MNF25883 MNF68487 MNF68478 MNF68501 MNF63775 MNF9944 MNF68473 MNF69224 MNF63568 MNF68479 MNF64146 MNF57858 MNF66733 MNF66816 MNF66868 MNF64321 MNF33520 MNF40065 MNF18314 MNF63848 MNF63851 MNF32875 MNF63850 MNF63873 MNF18007 MNF63571 MNF12313 MNF65984 MNF68861 MNF23806 MNF65774 MNF9927 MNF18123 MNF9925 MNF41633 MNF9928 MNF40063 MNF18122 MNF65775 MNF63849 MNF63888 MNF21726 MNF41567 MNF66817 MNF66845

Browick Suton Street Spooner Row Ashwellthorpe

Legend

- Site Boundary
- 1km search radius

Non-designated Heritage Assets:

HER Record Point

- Monuments
- Findspots

HER Record Line

- Monuments

HER Record Polygon

- Monuments
- Findspots
- Negative evidence

N

0 200 400m

Scale at A3: 1:20,000

MAKING COMPLEX EASY

Figure 2b

Non-Designated Heritage Assets

Project Ref: N:\26000-26999\26175 - Silfield Garden Village\Figures\Mapping\GIS\Projects\Figure 2b HER Data.mxd

NB 13/03/2020

ENF91186
ENF141517
ENF141037
ENF132445
ENF98767
9437
54648
54646
33723
54656
ENF143449
ENF93435
ENF92964
ENF137493
ENF123763
53332
53333
31470
ENF131283
ENF143191
ENF130458
ENF15070
ENF15077
53334
ENF142340
ENF143191
ENF142446
ENF138749
57368
ENF130459
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54698
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17143
54707
57361
57367
54712
57359
57360
57365
9945
ENF98773
54713
54701
54711
57364
54716
ENF135321
18314
57363
54718
54710
54709
54686
54685
ENF135321
54669
54673
21726

Legend

- Site Boundary
- 1km search radius

Non-designated Heritage Assets:

- NMR Point
- NMR Polygon

Previous Archaeological Work:

- HER Events

N

0 200 400m

Scale at A3: 1:20,000

MAKING COMPLEX EASY

Figure 2c:

HER Events and NMR Data

Project Ref: N:\26000-26999\26175 - Silfield Garden Village\Figures\Mapping\GIS\Projects\Figure 2c HER Events.mxd

NB 13/03/2020

Legend

Site Boundary

LiDAR DATA

Source:
Environment Agency

Data Type: DSM

Resolution: 2m

Date Captured:
26/11/2001

Processing:
simple Local Relief Model overlaid on Multi-direction Hillshade

N

0 200 400m

Scale at A3: 1:12,000

MAKING COMPLEX EASY

Figure 3

LiDAR Data

Project Ref: N:\26000-26999\26175 - Silfield Garden Village\Figures\Mapping\GIS\Projects\Figure 3 LiDAR Plot.mxd

Site Boundary (approximate)

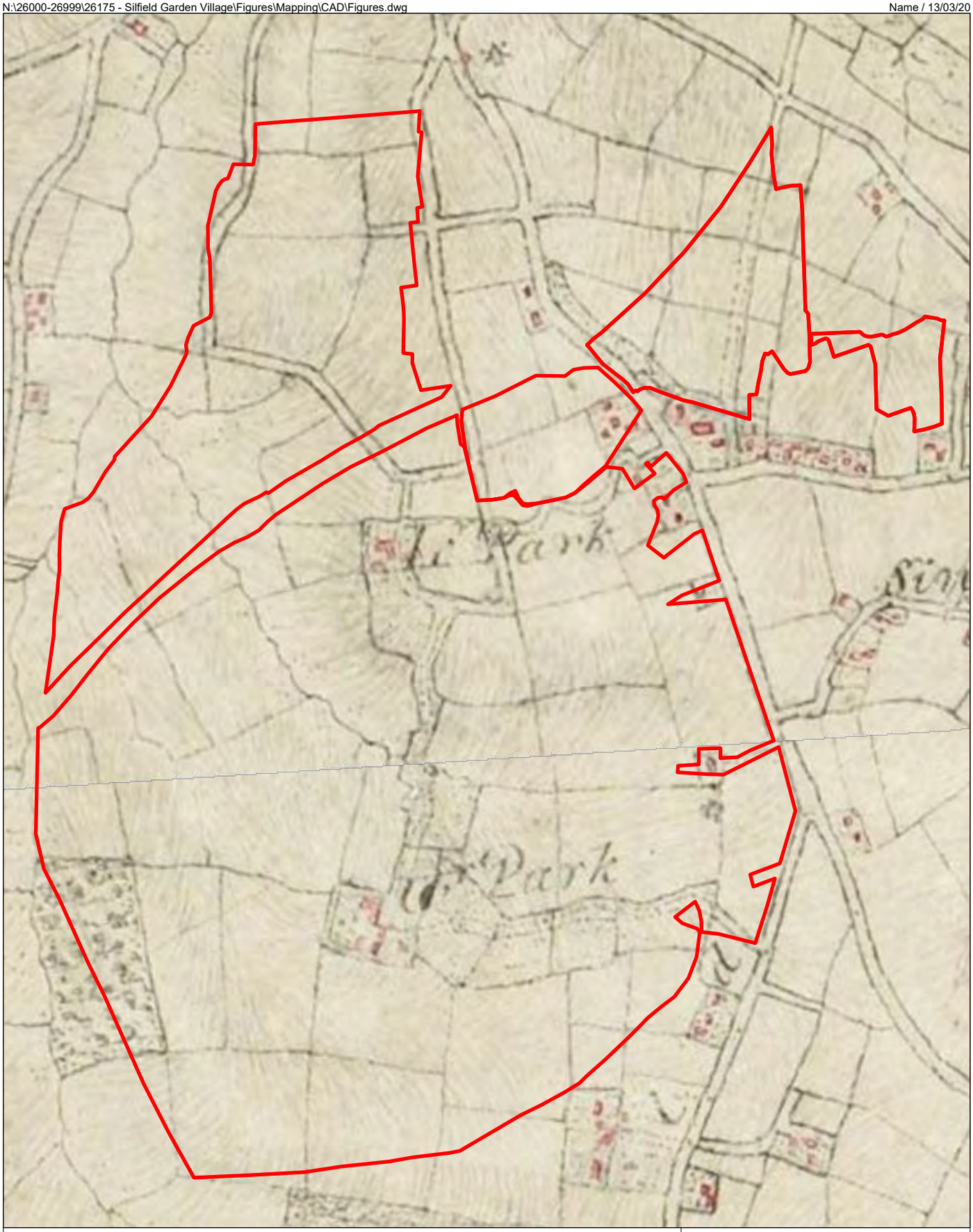
N

Not to Scale:
Illustrative Only

MAKING COMPLEX EASY

Figure 4

1797 Faden Map



Site Boundary (approximate)

N

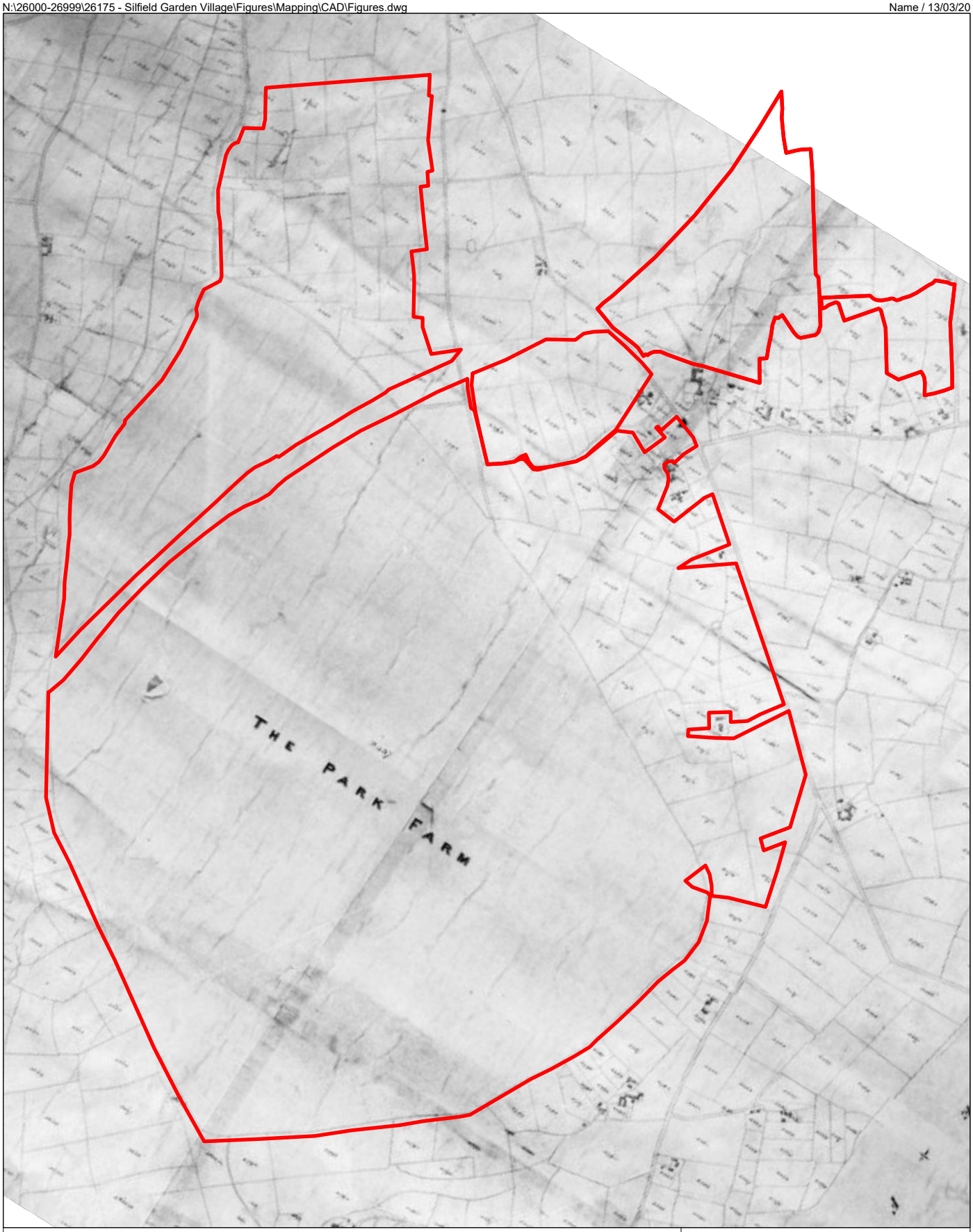
0 150 300m

Scale at A4: 1:15,000 (approx.)

MAKING COMPLEX EASY

Figure 5

1818 Ordnance Survey Drawing



Site Boundary

N

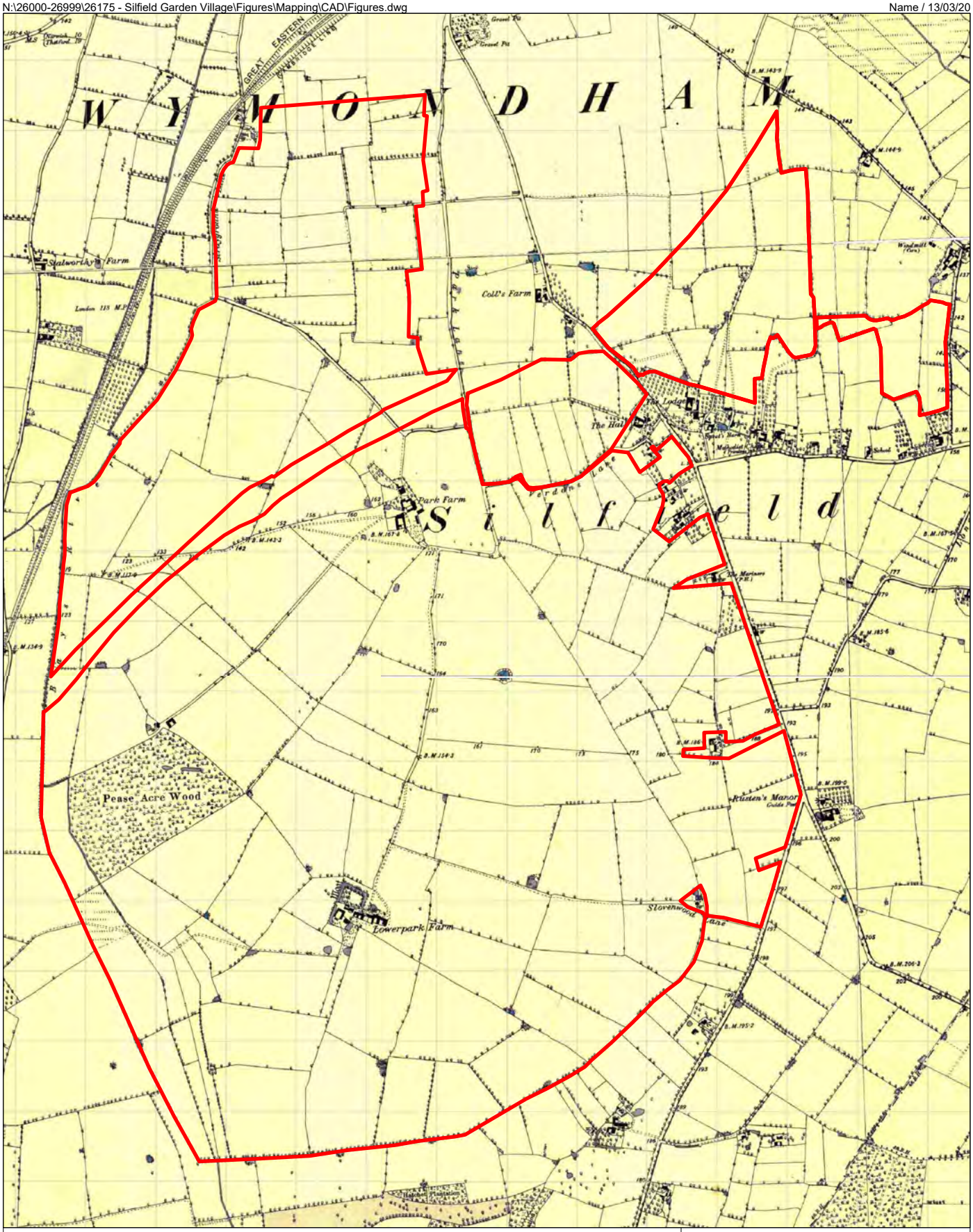
0 150 300m

Scale at A4: 1:15,000

MAKING COMPLEX EASY

Figure 6

1839 Wymondham Tithe Map



Site Boundary

N

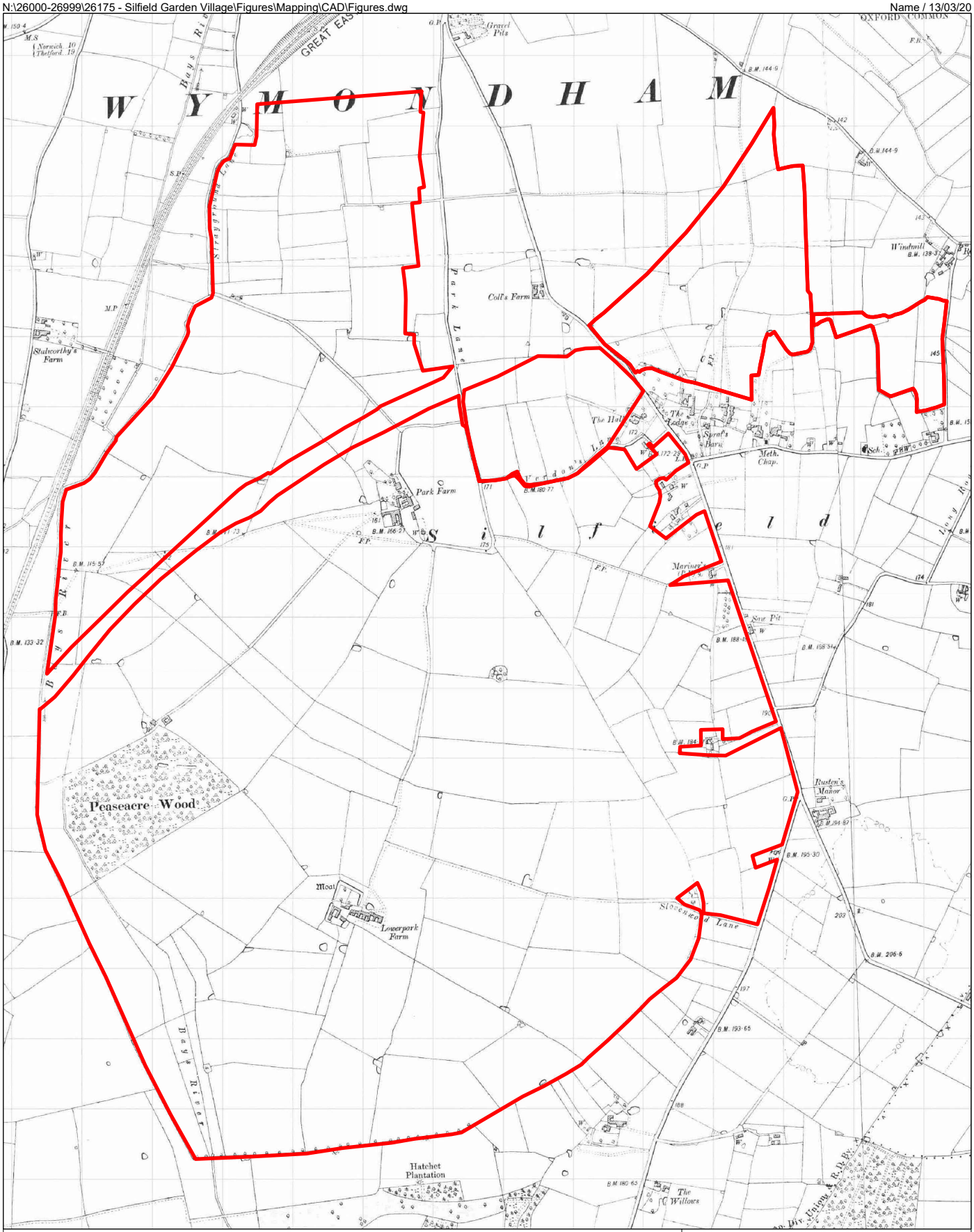
0 150 300m

Scale at A4: 1:15,000

MAKING COMPLEX EASY

Figure 7

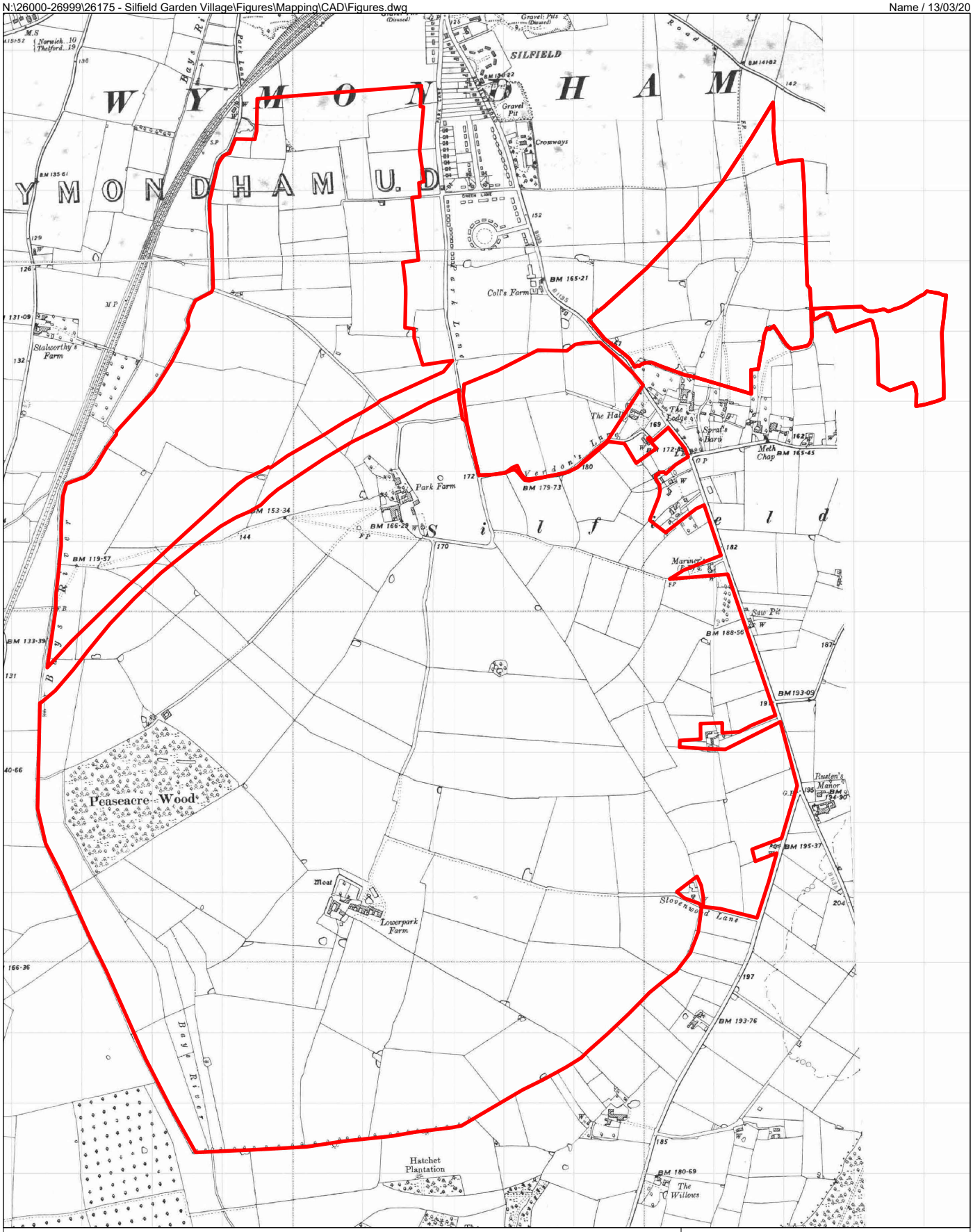
1882 Ordnance Survey Map



MAKING COMPLEX EASY

Figure 8

1905-1907 Ordnance Survey Map



Site Boundary

N

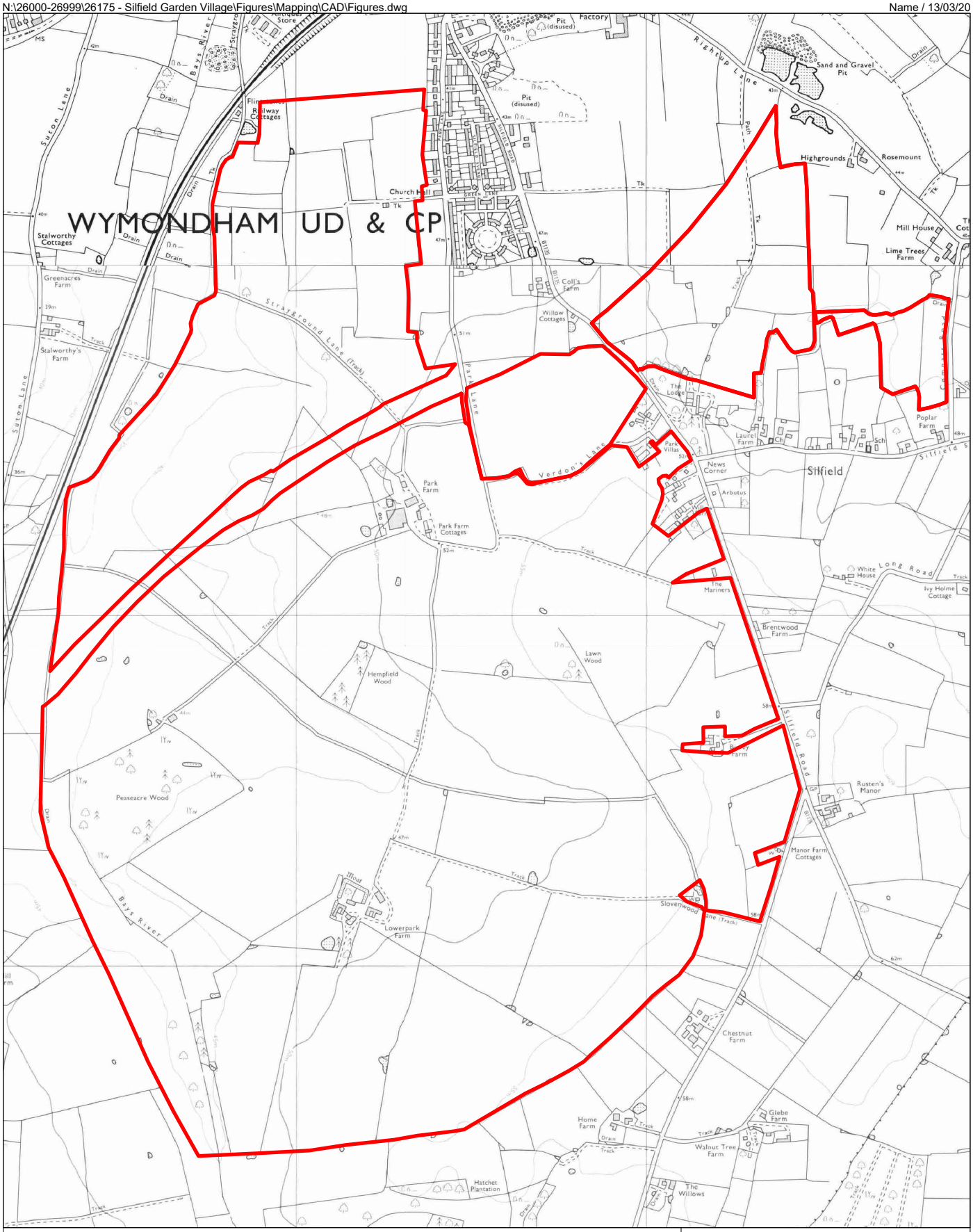
0 150 300m

Scale at A4: 1:15,000

MAKING COMPLEX EASY

Figure 9

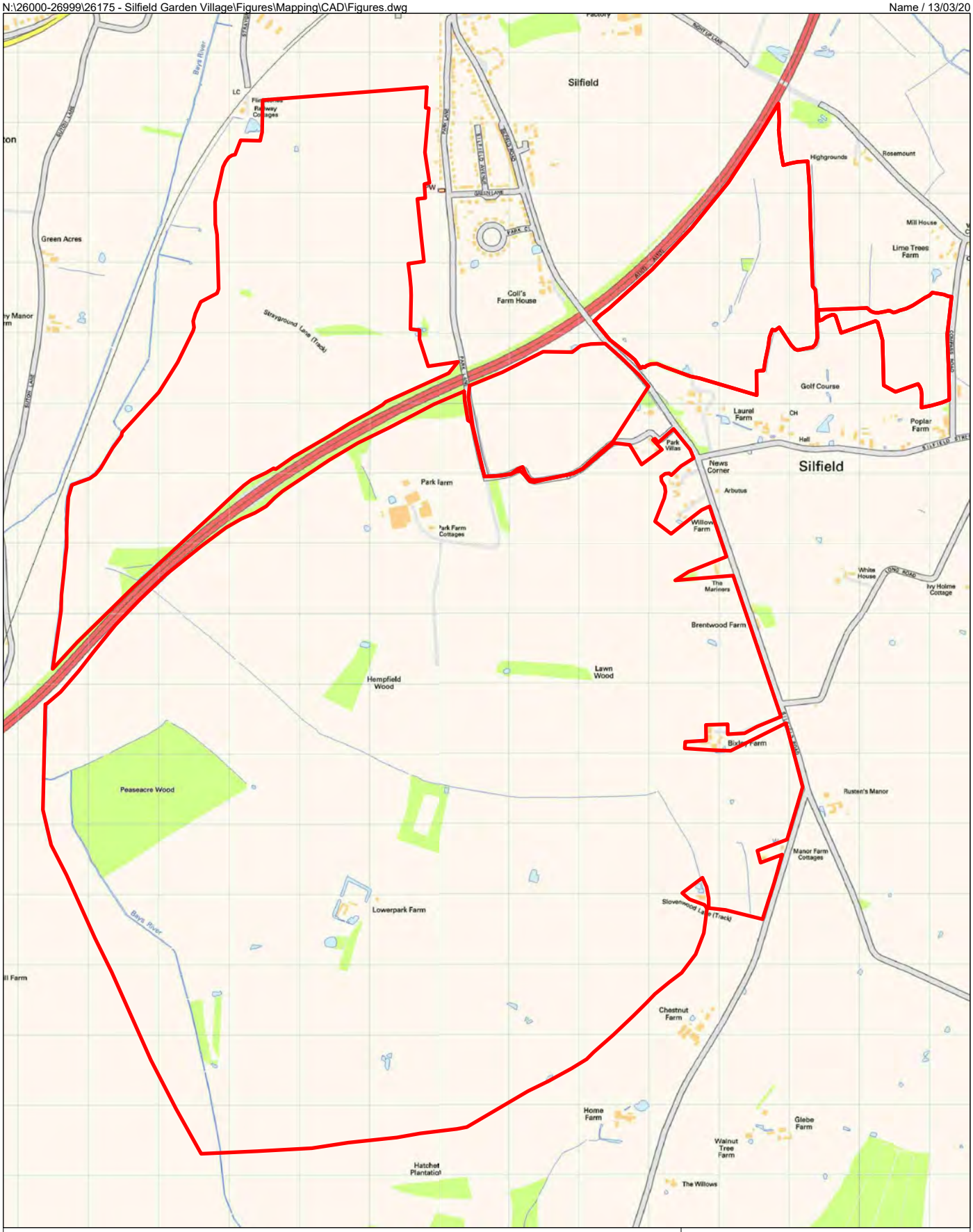
1950 Ordnance Survey Map



MAKING COMPLEX EASY

Figure 10

1977 Ordnance Survey Map



Site Boundary

N

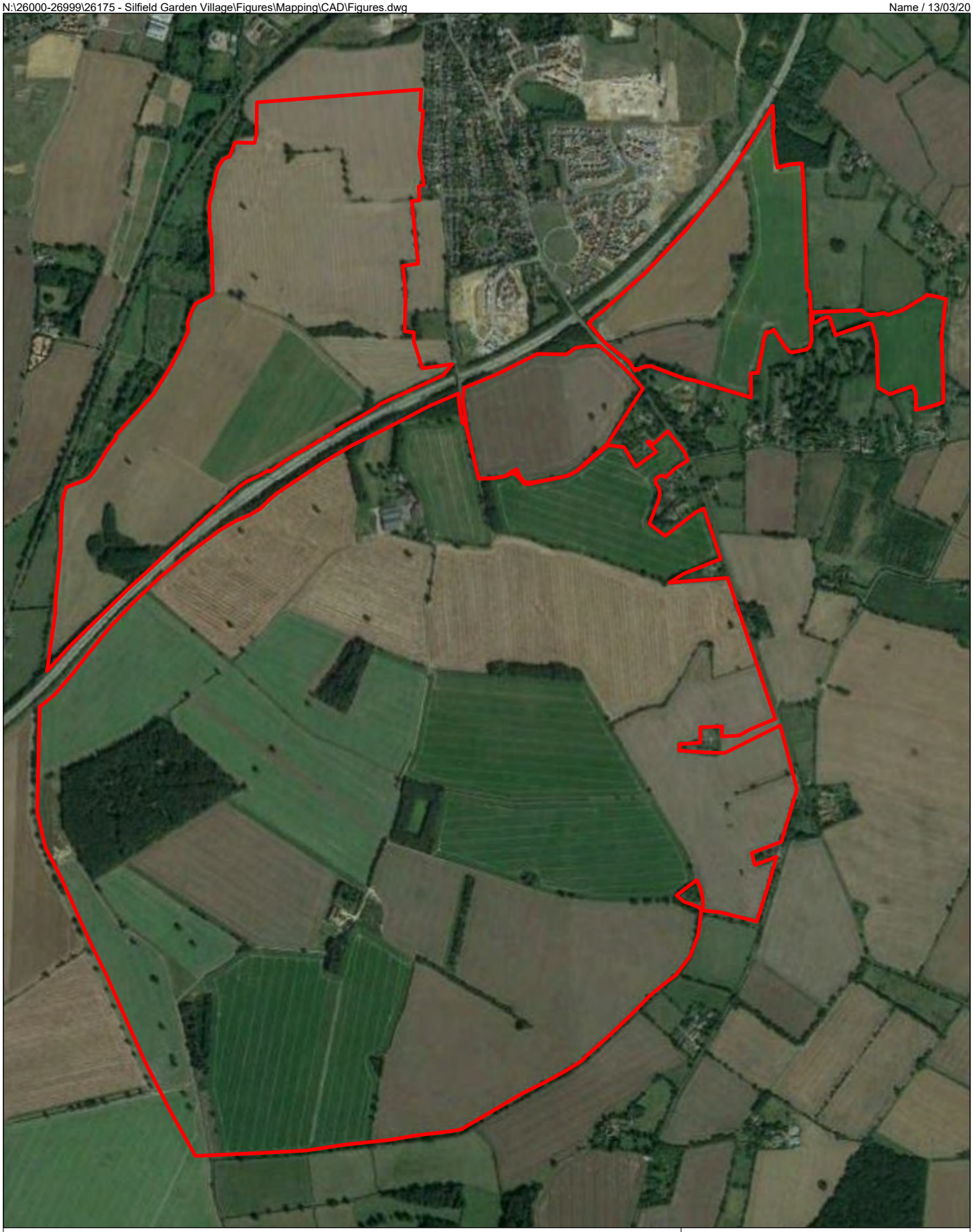
0 150 300m

Scale at A4: 1:15,000

MAKING COMPLEX EASY

Figure 11

2001 Ordnance Survey Map



Site Boundary

N

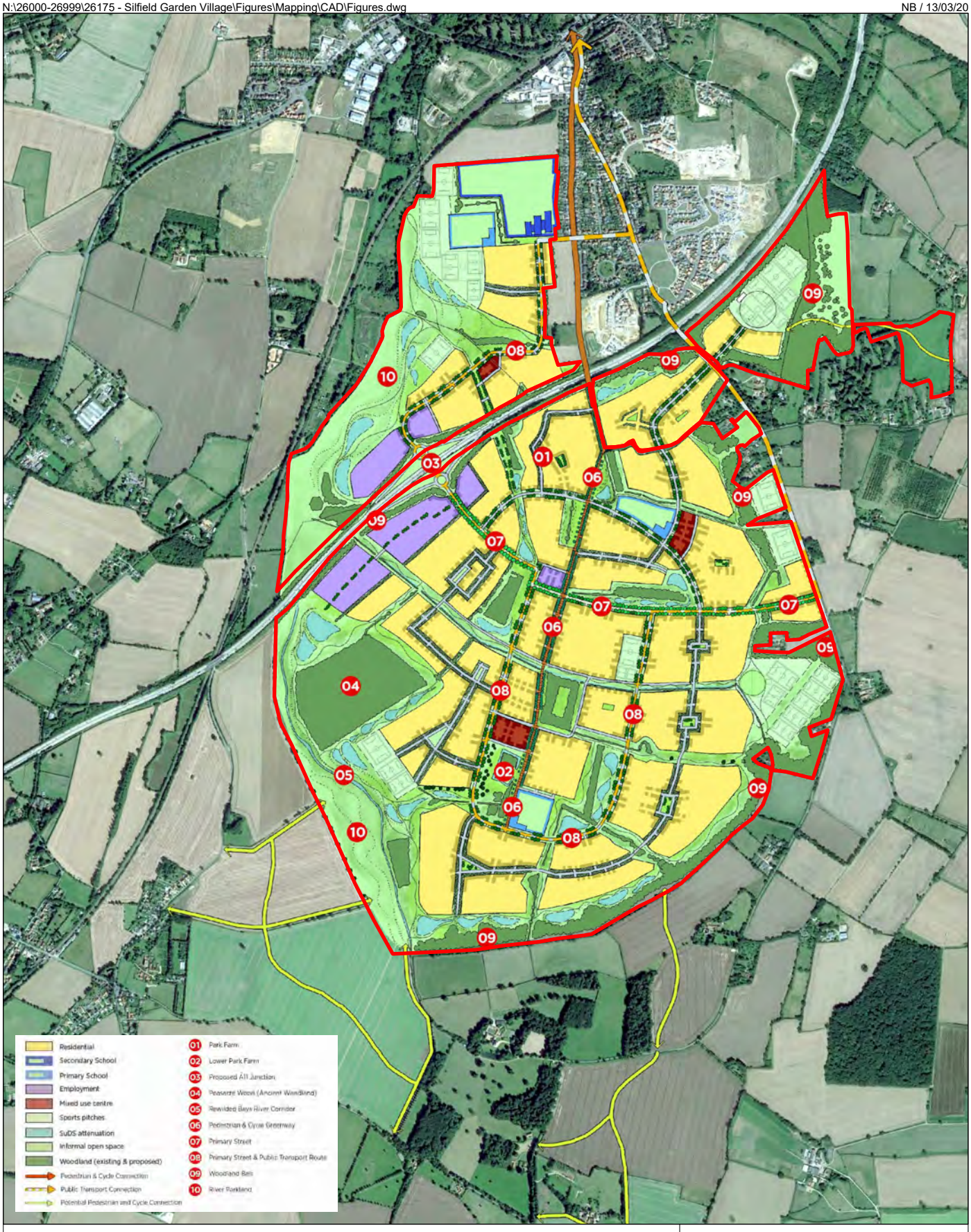
0 150 300m

Scale at A4: 1:15,000

MAKING COMPLEX EASY

Figure 12

2019 Google Earth Image



Site Boundary

N

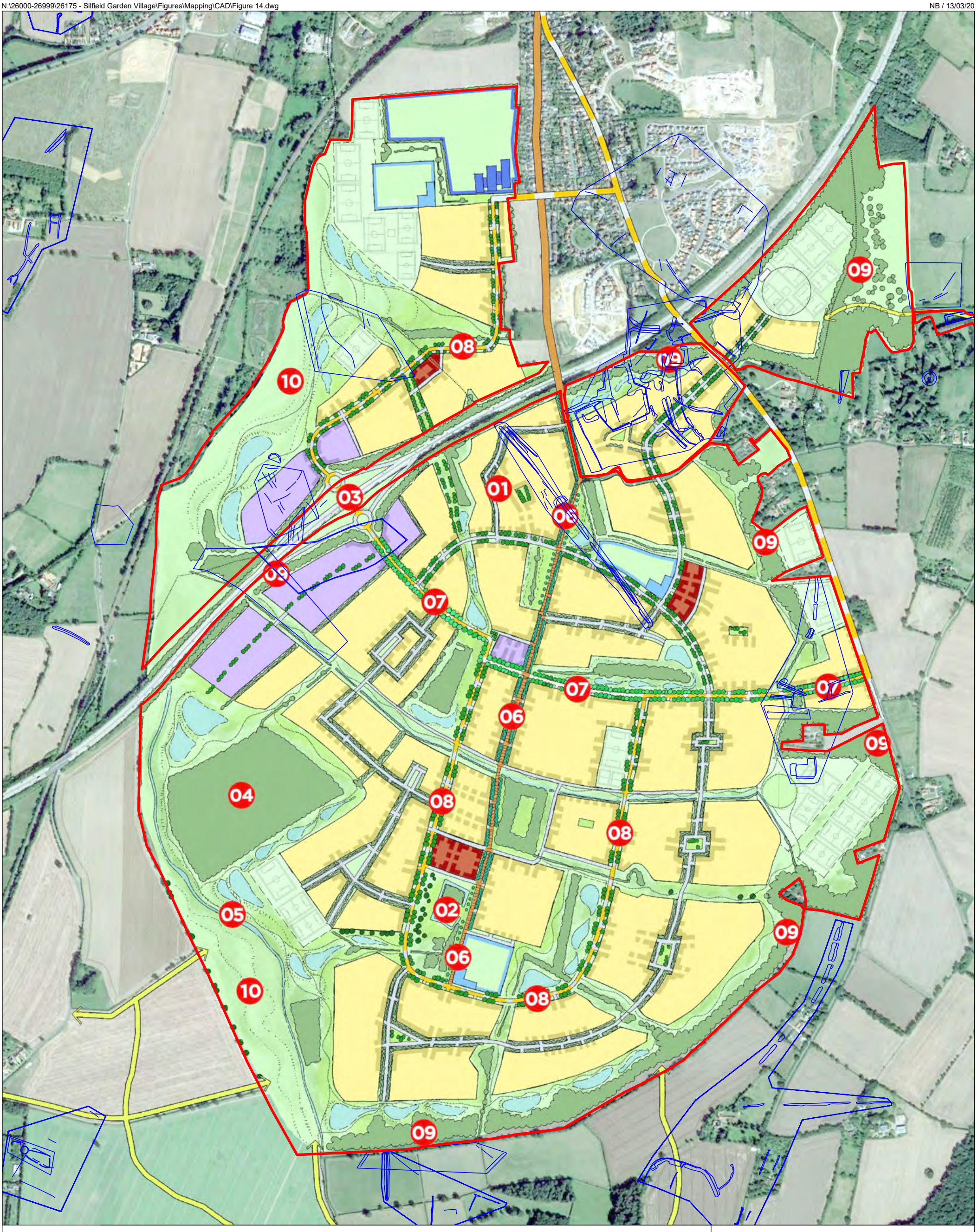
0 100 200 300 400 500m

Scale at A4: 1:20,000

MAKING COMPLEX EASY

Figure 13

Development Masterplan



Site Boundary

Cropmarks

N

0 100 200m

Scale at A3: 1:10,000

MAKING COMPLEX EASY

Figure 14

Masterplan Overlaid with Cropmark Data

Plate 1:

Plate 2:

Plate 3:

Plate 4:

Plate 5:

Plate 6:

rpsgroup.com

Desk Review of Soils & Agriculture at Silfield Garden Village (Land Research Associates)

DAVID LOCK ASSOCIATES

Desk Review of Soils & Agriculture at Silfield Garden Village (Land Research Associates)

DESK REVIEW OF SOILS & AGRICULTURE AT SILFIELD GARDEN VILLAGE NORFOLK

Land Research ASSOCIATES
www.lra.co.uk

DESK REVIEW OF SOILS & AGRICULTURE AT SILFIELD GARDEN VILLAGE, NORFOLK

L Thomas, MSc

Report 1653/1
Land Research Associates Ltd
Lockington Hall,
Lockington,
Derby
DE74 2RH
www.lra.co.uk

21st February, 2020

1.0 Introduction

1.1 This review provides provisional information on the soil resources and agricultural quality of approximately 451 ha of land near Wymondham, South Norfolk. The farming circumstances of land within the site is also reviewed.

1.2 The land comprises a number of large arable fields lying to the north and south of the A11. The site is slopes gently to the south-east, at an average elevation of approximately 50 m AOD.

1.3 1:50,000 scale BGS information records the geology of the land as Lewes Nodular Chalk Formation, Seaford Chalk Formation, Newhaven Chalk Formation, Culver Chalk Formation and Portsdown Chalk Formation (undifferentiated). The basal geology is recorded to be overlain by superficial deposits of Lowestoft Formation till, with a small area of Lowestoft Formation Sand and Gravel in the north and strips of alluvium in the west.

1.4 The National Soil Map (published at 1:250,000 scale) shows the site as Burlingham 1 Association, deep coarse and fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Also within this Association are some well drained coarse and sandy soils[1].

[1]Hodge, C.A.H., *et al.,* (1984). *Soils and their Use in Eastern England,* Soil Survey of England and Wales Bulletin No. 13, Harpenden.

2.0 Farming Circumstances

2.1 The farming circumstances of the land were obtained by questionnaire. All of the land within the Application Site is landowner-farmed. The site is part of an arable farming operation growing wheat, barley, oil seed rape, peas and parsley. The landowner also farms *c.* 325 ha of land outside the Application Site which would not be affected by the Proposed Development.

3.0 Agricultural land quality

3.1 To assist in assessing land quality, the Ministry of Agriculture, Fisheries and Food (MAFF) developed a method for classifying agricultural land by grade according to the extent to which physical or chemical characteristics impose long-term limitations on agricultural use for food production. The MAFF ALC system classifies land into five grades numbered 1 to 5, with grade 3 divided into two subgrades (3a and 3b). The system was devised and introduced in the 1960s and revised in 1988.

3.2 Land of grades 1, 2 and subgrade 3a is considered to be of the best and most versatile agricultural quality; deemed the most flexible, productive and efficient in response to inputs, it is the best to deliver future crops for food and non-food uses (such as biomass, fibres and pharmaceuticals. Subgrade 3a, grade 4 and 5 land is considered poorer quality land.

3.2 The agricultural climate is an important factor in assessing the agricultural quality of land and has been calculated using the Climatological Data for Agricultural Land Classification[2]. The relevant site data for the site is given below.

- Average annual rainfall: 667 mm
- January-June accumulated temperature >0°C 1379 day°
- Field capacity period (when the soils are fully replete with water) 134 days late Nov-early Apr
- Summer moisture deficits for: wheat: 112 mm potatoes: 105 mm

3.2 There are no climatic limitations to agricultural land quality at this locality.

3.3 There is no overriding flood risk or topographic constraint which would limit land quality.

ESTIMATION OF LAND QUALITY

3.4 This assessment considers the following properties:

- Published soils and geology
- Climatic data for the site (which interact with soil properties to affect soil wetness and droughtiness constraints in the ALC system issued in 1988 by MAFF[3]).

[2]Meteorological Office, (1989).*Climatological Data for Agricultural Land Classification*.
[3]MAFF, (1988).*Agricultural Land Classification for England and Wales: Guidelines and Criteria for Grading the Quality of Agricultural Land*.

- Relevant detailed ALC surveys in the area
- Historical aerial imagery

3.5 The majority of the site is overlain by superficial deposits of glacial till. Within the Burlingham 1 Association, the main soil series formed in this geology are: fine loamy Burlingham Series; loamy over clayey Ashley Series; and clayey Hanslope Series. These soils are typically seasonally waterlogged (imperfectly draining Soil Wetness Class III) although better structured soils of the Burlingham Series provide land that suffers only occasional waterlogging (Wetness Class II). This land is likely to be of grade 3 agricultural quality, although a detailed ALC survey would be required to determine the extent of subgrade 3b and 3a land.

3.6 Land of poorer quality within the Site can be identified flanking the A11 where borehole data show the topsoils to directly overlie slowly permeable chalky boulder clay (Hanslope Series). This land is likely to be of subgrade 3b agricultural quality.

3.7 The Burlingham 1 Association is extensive across Norfollk, covering 615 km^2. Land directly adjoining Wymondham is shown to be formed on sand and gravel deposits, typically giving land of best and most versatile agricultural quality. Elsewhere in the South Norfolk district, land is predominantly formed on superficial deposits of glacial till - usually providing a mixture of subgrade 3a and 3b agricultural quality land. From the information available, the site is of average agricultural quality for the locality.

3.8 There are no ALC surveys to current guidelines within an 8 km radius of the site.

4.0 Conclusions

4.1 The available published information indicates that land within the Application Site is likely to comprise fine loamy and loamy over slowly permeable land of grade 3 agricultural quality (subgrade 3a and 3b). Land quality within the Application Site is typical of the locality, with the majority of land formed in superficial deposits of glacial till. Borehole data shows poor quality subgrade 3b land likely to be found flanking the A11, where loamy topsoil directly overlies slowly permeable chalky boulder clay. Overall however, there is a general lack of information available regarding land quality and confirmation of ALC grades is subject to further investigations at a later stage.

4.2 The site is landowner farmed with a large amount of available land outside the Application Site to continue the farming operation should the Proposed Development go ahead.

Economic Strategy Statement (Turley)

Economic Strategy Statement (Turley)

DAVID LOCK ASSOCIATES

SILFIELD GARDEN VILLAGE

Economic Strategy Statement

INTRODUCTION

Silfield Garden Village is a sustainable new community of 6,500 homes for 15,000 people. It will be a multi-generational community, with a significant number of economically active residents potentially numbering some 7,000 people.

The Garden Village will play an important economic and social role in the Greater Norwich area, helping to meet the need for homes in the longer term as well as providing a sustainable location for growing businesses in the Cambridge-Norwich tech Corridor.

THE CONTEXT

Silfield Garden Village is located in one of the most dynamic and productive economic areas of the UK; the Cambridge-Norwich Tech Corridor.

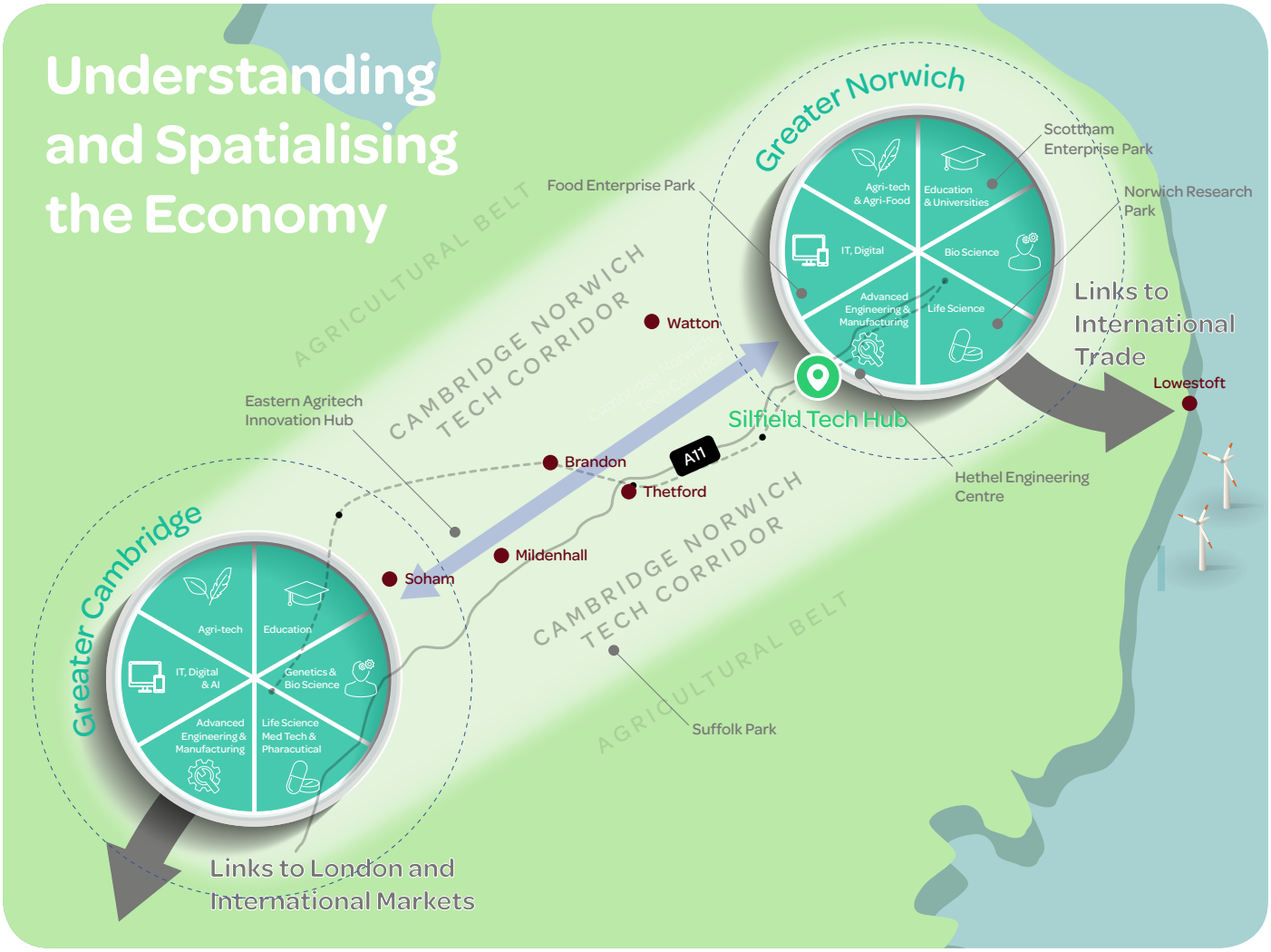
It is strategically located between two centres of research, innovation and knowledge intensive activity in Norwich and Cambridge, while at the same time being located on the doorstep of existing economic hubs and the areas' agricultural hinterland, which can act as a test bed for the commercialisation of innovation and implementation of new processes, products and services.

Silfield also benefits from proximity to globally competitive clusters and specialisms in the agri-food, clean energy and ICT/digital sectors. These sector strengths are helping to position Norfolk and Suffolk as the "UK centre for hi-tech, precision agriculture and food production' and internationally as a 'global exemplar for clean, low carbon energy production'[1].

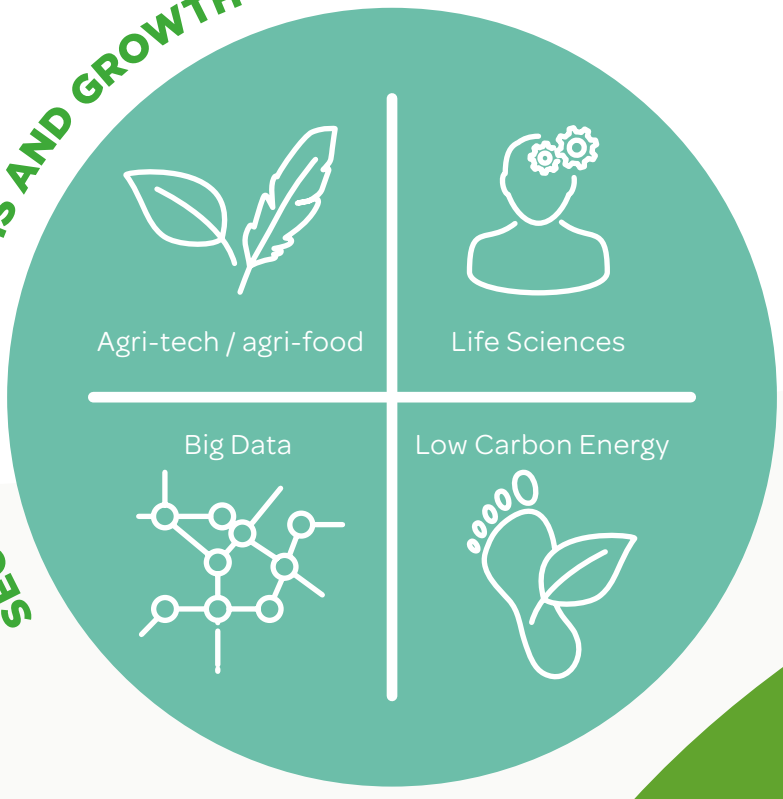
The Garden Village benefits from exceptional accessibility to the A11 and a mainline rail connection, which provides access to the thriving economies of Cambridge in an hour and Norwich in under 15 minutes. Silfield Garden Village is "plugged in" to the wider tech corridor, its labour force and business supply chains by virtue of its accessibility and strategic location.

1 Ibid

Understanding and Spatialising the Economy



SECTOR STRENGTHS AND GROWTH POTENTIAL



SOCIAL AND ECONOMIC STRATEGY

The social and economic strategy for Silfield Garden Village is to:

1. Provide opportunities for 1 in every 3 economically active residents to live and work on site in a range of employment opportunities, from entry level to skilled and professional roles

2. Provide excellent accessibility to public transport connections to enable residents to make sustainable travel to work choices within the wider Cambridge-Norwich Tech Corridor

4. Provide space for growing businesses to flourish

5. Provide opportunities for businesses to transition to low carbon and ultimately net zero carbon operations over time

7. Meet the social infrastructure needs of the new community in full

8. Deliver a range of affordable homes and products that enables multi-generational living

3

Create dedicated business environments within the Garden Village which will appeal to a broad range of business occupiers in the dynamic and growing sectors which are a feature of the Cambridge-Norwich Tech Corridor

6

Provide on-site energy infrastructure which ensures resilience of energy supply for businesses and residents and maximises opportunities for green energy

9

Create an environment which promotes healthy lifestyles and wellbeing

DELIVERING THE VISION

The masterplan includes the following key features which will realise the social and economic vision in full:

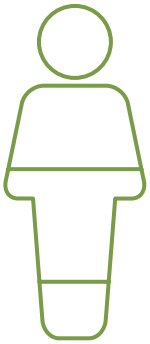
- Potential for up to 2,500 jobs on site, enabling residents to access a wide range of employment opportunities
- A "Tech Hub" business park with direct access to the A11 and walking / cycle links to Wymondham station. Land within the Tech Hub is sufficient to accommodate scale-up businesses
- Mixed use centres containing a range of smaller scale and co-working opportunities
- A net zero carbon energy strategy for the Garden Village which will yield energy resilience and potential business cost savings
- Social infrastructure (healthcare, education, community and greenspace) meeting the requirements of communities in full
- A range of house types, sizes and tenures to meet multi-generational housing needs

ECONOMIC BENEFITS

Silfield Garden Village will create significant social and economic benefits for the local and Greater Norwich economies through the construction process and then as houses and business spaces are occupied.

Construction Phase

£1 billion
Investment
In the Garden Village's construction



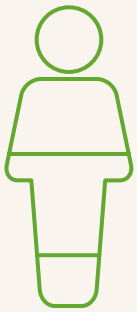
230 gross jobs
Full time equivalent (FTE) jobs supported on average throughout construction (circa 25 years)

Generating 170 net direct jobs
Including 75 FTE jobs for South Norfolk residents

Plus 85 net indirect/induced jobs
Including 20 FTE jobs for South Norfolk residents

£527 million
Productivity boost
GVA economic output[2] during construction, including £421 million in South Norfolk

Operational Phase



2,480 on-site jobs
In a variety of occupations, including agri-tech, manufacturing, renewable energy, education and retail

Generating 1,770 net direct jobs
Including 1,210 FTE jobs for South Norfolk residents

Plus 880 net indirect/induced jobs
Including 300 FTE jobs for South Norfolk residents

£252 million
Productivity boost
GVA economic output per annum, including £215 million in South Norfolk

£2.3 million
Business Rates
Collected each year by South Norfolk Council

Over 15,000
Residents
Living in the new homes, 7,800 of whom will be of working age and in employment

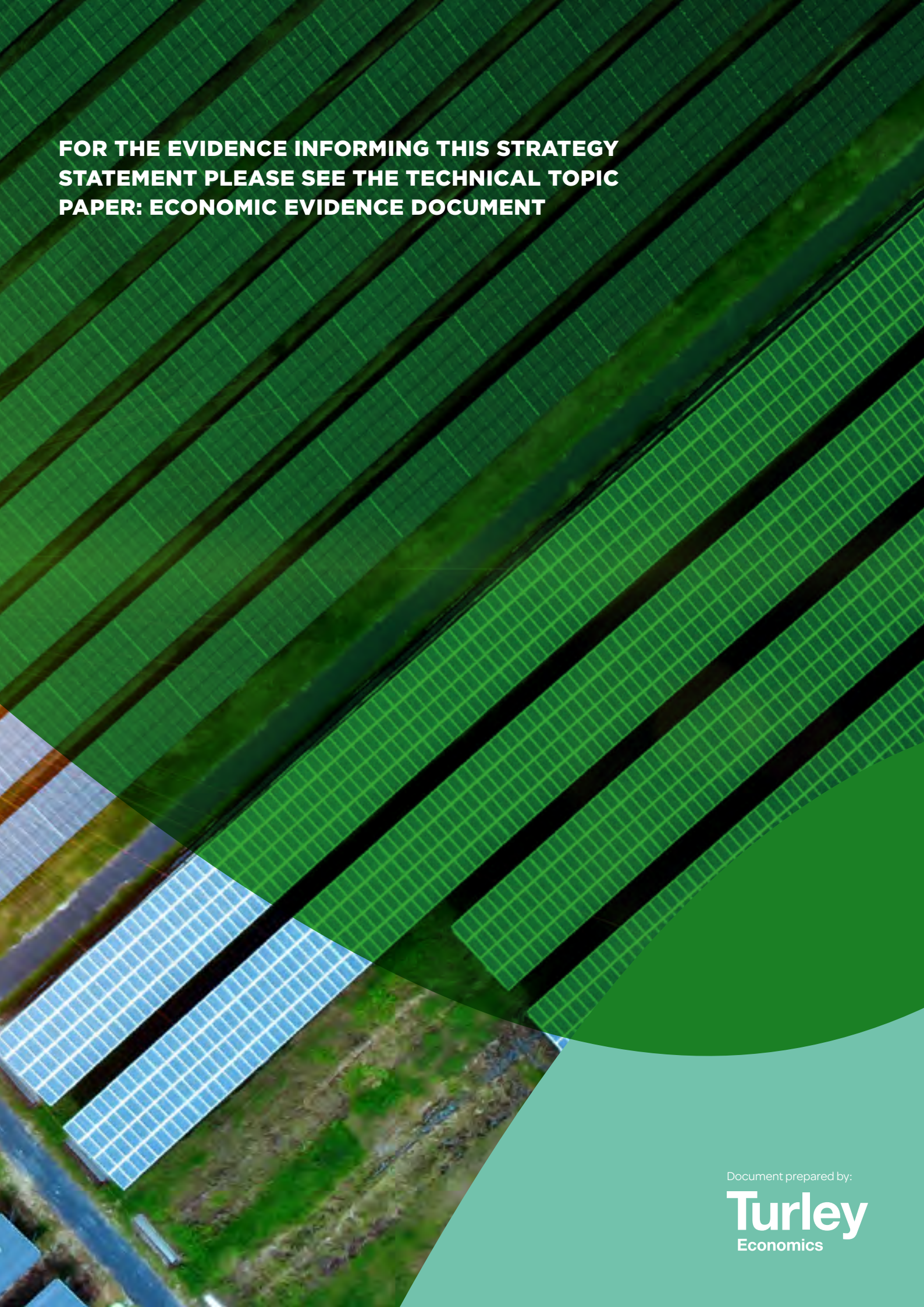
£204 million
Wages
Earned annually by residents

£12 million
Council Tax
Collected each year by South Norfolk Council

£125 million
Expenditure
By residents each year on retail and leisure goods and services

Over 1,000
Retail and leisure jobs
Supported by resident expenditure

2 GVA (Gross Value Added) measure the value of output created (i.e. turnover) net of inputs used to produce a good or service (i.e. production of outputs). It provides a key measure of economic productivity. Put simply the GVA is the total of all revenue into businesses, which is used to fund wages, profits and taxes



FOR THE EVIDENCE INFORMING THIS STRATEGY STATEMENT PLEASE SEE THE TECHNICAL TOPIC PAPER: ECONOMIC EVIDENCE DOCUMENT

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Flood Risk and Drainage Appraisal (Stantec)

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orbit building communities

BOWBRIDGE LAND

Silfield Garden Village

Flood Risk and Drainage Appraisal

March 2020

Document Control Sheet

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For and on behalf of Stantec UK Limited				

Revision	Date	Description	Prepared	Reviewed	Approved

This report has been prepared by Stantec UK Limited ('Stantec') on behalf of its client to whom this report is addressed ('Client') in connection with the project described in this report and takes into account the Client's particular instructions and requirements. This report was prepared in accordance with the professional services appointment under which Stantec was appointed by its Client. This report is not intended for and should not be relied on by any third party (i.e. parties other than the Client). Stantec

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Contents

Executive Summary

This report has been prepared by Stantec UK Limited, on behalf of our clients, Orbit Building Communities and Bowbridge Strategic Land, to support an emerging proposal for a proposed new Garden Village, located to the south of Wymondham, and west of Silfield, hereafter named Silfield Garden Village.

The vision for Silfield Garden village is to build a vibrant and NetZero sustainable garden village, creating a distinct, self-contained and sustainable community.

The site is located predominately in Flood Zone 1, Low Probability from fluvial (river) flooding. The topography indicates the land is at the head of a fluvial sub-catchment, with watersheds located predominately from the east to the west. The receiving watercourse from this land passes flow predominately to the west to the Bays River. Most of the site is also shown to be at low risk from Surface Water flooding. These areas relate to the existing watercourses traversing the site and along the western boundary (Bays River). This area is not vulnerable to groundwater flood risk or inundation from a registered reservoir.

As part of the delivery for this sustainable community it is proposed to include a fully integrated sustainable surface water management system, designed to not only manage flood risk and avoid detriment to offsite areas, but to also provide betterment to water quality and provide ecological enhancement. The premise of this report is to inform what will be used in the development of the masterplan and for promotion at the Local Plan Stage.

The surface water flood risk is manageable on site and the surface water drainage strategy give opportunity to provide some betterment to control rapid agricultural runoff which is likely to be present in the local catchment. Overall the site is well positioned to deliver the Garden Village community and will meet the requirements of both national and regional policy.

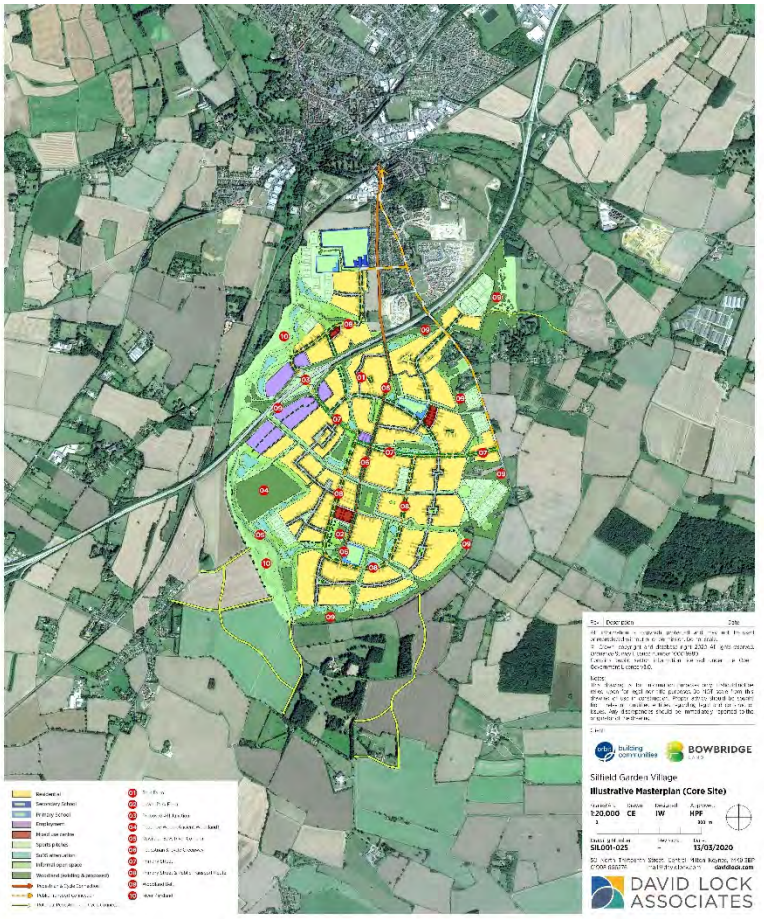


Figure 1: Masterplan

1 Introduction

1.1.1 This report considers the baseline conditions of the site, specifically impact of flooding, the constraints and the opportunities that this site affords and where necessary the potential suitable mitigation measures.

1.1.2 Whilst planning policy, both at a regional and local level, is often used to shape flood risk and drainage design for sites, this is seen as the foundation for the vision of this site, with the proposal to deliver a design which goes beyond the standard approach with regard to sustainability and in accordance with Garden Village Principles at its heart.

1.1.3 The details within the report are based on data available at the time of this study and is a high-level assessment. The findings are subject to change following receipt of further data, such as a site-wide topographical survey, details of any future ground investigations, and consultations with the statutory authorities, which are all proposed in support of a future planning application.

1.1.4 It should also be noted that this document is not a Flood Risk Assessment (FRA) or a supporting Sustainable Drainage Statement, both which are to be undertaken as part of a suite of technical documents in support of a future Planning Application. All proposals with respect to flood risk and drainage are therefore subject to agreement with stakeholders such as the Environment Agency (EA), Local Planning Authority (LPA), the Lead Local Flood Authority (LLFA) which for this site is Norfolk County Council (NCC) and Anglian Water (AW).

Purpose of this report

1.1.1 The purpose of this report is to explore how the strengths of a development in this location can be harnessed and developed to enable local flood risk and surface water drainage policy objectives to be met. A brief overview of the impacts associated with development in this location, both in terms of opportunities for sustainable surface water drainage and in terms of flood risk have also been provided.

1.1.2 The document has been prepared as a template for the future sustainable surface water drainage strategy but also to help inform the next stage of the Greater Norwich Local Plan process.

Report structure

1.1.3 The remainder of this report is structured as follows:

- **Section 2** sets out the existing site details and hydrological context of the site, from existing data sources and studies;
- **Section 3** summaries the existing flood risk and surface water drainage policies which have been and are to be considered in the future development;
- **Section 4** provides details on the existing flood risk conditions effecting the site from both existing data sources and studies;
- **Section 5** presents an early indication of a future surface water drainage strategy based on preliminary calculations and assumptions;
- **Section 6** summarises conclusions and recommendations.

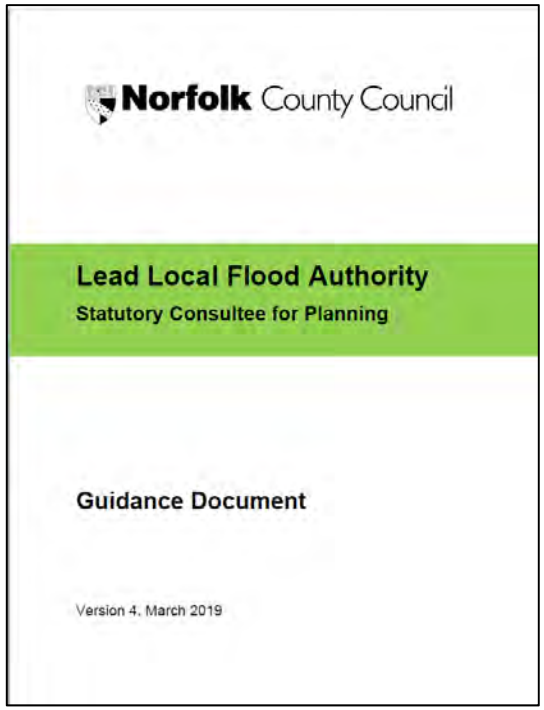
Baseline Data

The following documents are also relevant to the development and have been reviewed to inform the appraisal:

- Environment Agency (EA) published ‘Open Data’ datasets available online, reproduced with OS mapping under licence to PBA/ Stantec (contains Ordnance Survey data © Crown copyright and database right [2016/2018], contains Environment Agency information © Environment Agency and database right);

FLOOD RISK AND DRAINAGE

- Ordnance Survey (OS) Maps;
- National Soil Resources Institute (NSRI) Soilscape Viewer;
- British Geological Survey (BGS) Online Digital Viewer;
- Norfolk Local Flood Risk Management Strategy (July 2015);
- National Planning Policy Framework (February 2019);
- Norfolk County Council Preliminary Flood Risk Assessment Report (July 2011);
- South Norfolk Development Management Policies Document (October 2015)
- Norfolk County Council Lead Local Flood Authority Statutory Consultee for Planning, Guidance Document (Version 4 March 2019)



2 Existing Baseline Information

Site Location

2.1.1 Silfield Garden Village will be located to the south of Wymondham and west of Silfield. The site consists of four parcels of land. The largest parcel of land lies to the south of the A11 with two smaller parcels to its north east corner, collectively hereafter referenced as the Southern site and the remaining parcel is located to the north of the A11, hereafter referenced as the Northern site.

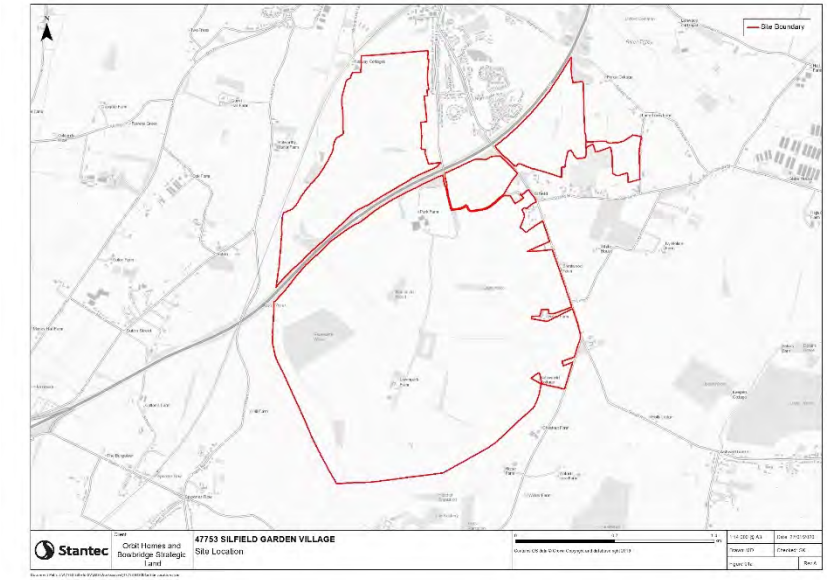


Figure 2: Site Location Plan

2.1.2 A Site Location Plan with Aerial Photography, reference Figure 01b, is contained in **Appendix A.** **Figure 2** above shows the site location.

Site Topography

2.1.3 Light Detecting And Ranging (LiDAR) topographical data indicate that the ground slopes towards the North West of the site. The highest side of the site lies on the south east side of the Southern site with an elevation of 89mAOD with the lowest level at approximately 30mAOD in the far west. The site slopes towards the Bays River (EA)on the north western edge of the site, as illustrated in **Figure 3 below**, also provided in **Appendix A**.

2.1.4 A topographical survey will be undertaken to help inform the production of a future FRA and Drainage Strategy for the site.

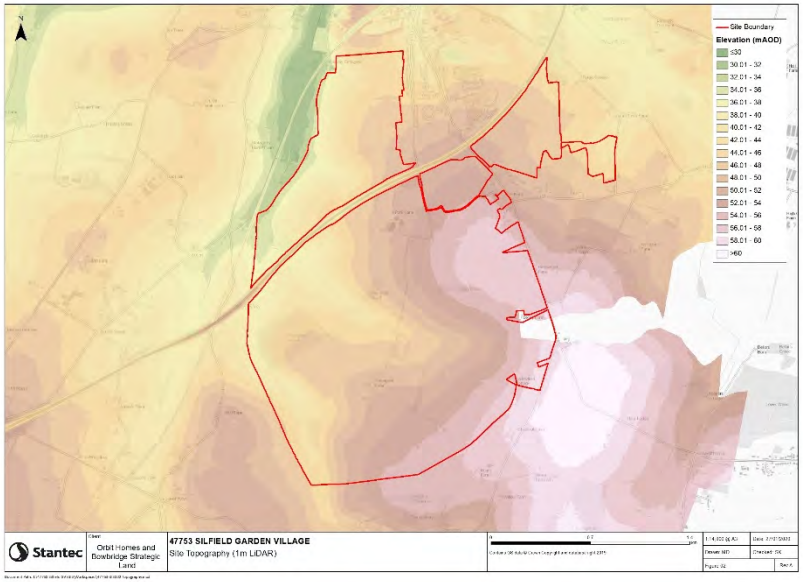


Figure 3: Area Topography

On Site Drainage

2.1.5 Based on the current baseline information available, the site is drained by existing watercourses.

2.1.6 A review of the OS mapping shows Bays River runs along the Western boundary of the Southern site, it is classed as an Ordinary Watercourse (OW) at this location, Bays River (OW). Before culverting under the A11. Following the culvert under the A11 the river follows the boundary of the Northern site before the confluence

with a tributary of the Bays River, where the River Bray is referred to as an EA Main River, Bays River (EA).

2.1.7 There are also two ordinary watercourses present at the site, these are as follows:

- Traversing through the central areas of the southern site an ordinary watercourse, which flows from the south east of the site to the north west where the watercourse is culverted under the A11. The culvert is located an estimated 1km east of Bays River (OW) culvert. The ordinary watercourse then follows the boundary of the North site along the A11 to Bays River (EA).
- An Ordinary watercourse lies to the north west of the south site along the western boundary of the Northern Site and flows towards the Bays River (EA).

2.1.8 The Northern and Southern site have a variety of small water bodies dotted within its perimeter. See **Figure 4** below. This is also included within **Appendix A**.

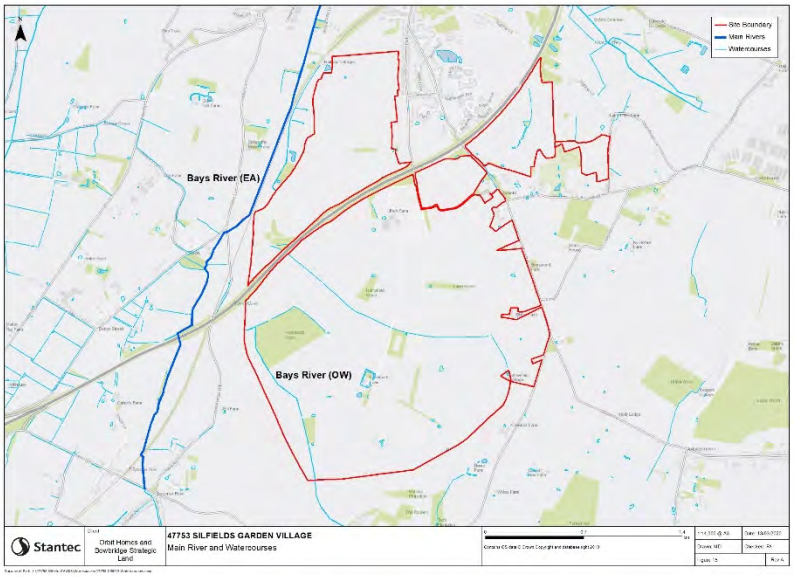


Figure 4: Existing Waterbodies

Public Sewers

2.1.9 AW asset plans have been obtained for the site and these show no sewers located within the site boundary. The closest foul water sewer lies at the junction between Green Lane and Silfield Lane to the north east of the site. Refer to **Appendix B** for a copy of the AW records.

2.1.10 The closest Water Recycling Centre (WRC) is the Wymondham WRC, located to the North East of Wymondham.

2.1.11 AW were contacted regarding the current capacity of the WRC works and it was acknowledged at the time of this assessment there is headroom available for 1000 new properties.

2.1.12 Whilst there is currently limited capacity for the total number of properties, AW have acknowledged their obligation to accept the necessary foul flows from the development should planning consent be granted. Therefore, as part of the planning application further consultation will be carried out with AW to ensure the necessary steps are undertaken to ensure there is enough treatment capacity following the planning consent.

2.1.13 AW consultation responses is provided in **Appendix B**.

Geological Context

2.1.14 Most of the site is underlain by the superficial geology of the 'Lowestoft Formations - Diamicton'. There are also areas located along the western Bays River Ordinary Watercourse (OW) corridor of the site which is underlain by alluvium clay, silt, sand and gravel. The 'Lowestoft Formations - Diamicton', deposits are classified as Secondary (undifferentiated) Aquifer by the EA, whilst the alluvium clay is classified as a Secondary A Aquifer by the EA.

2.1.15 The bedrock consists of a variety of chalks, Lewes Nodular Chalk, Seaford Chalk, Newhaven Chalk, Culver Chalk and Portsdown Chalk Formations. The bedrock geology is classified as a Principle Aquifer by the EA.

2.1.16 A review of BGS boreholes indicates that there is potentially more than 20 meters of clay below ground level. As such, the use of infiltration for the proposed surface water drainage is unlikely. This is reinforced by the National Soil Resources Institute (NSRI) Soilscape viewer, which indicates that the site is situated on 'Slightly acid loamy and clayey soils with impeded drainage'.

2.1.17 **Figure 5** below and provided in **Appendix A,** shows the site is located in groundwater source protection zone (SPZ) 3. SPZ3 is defined by the EA and is also referred to as the total catchment. Whilst infiltration is not considered to be likely at the site, due to the underlying geology at the site, the protection of the underlying groundwater and aquifer will need to be considered at the design stage. The treatment of the surface water generated through the development will therefore be managed in accordance with the SuDS Manual Simple Index approach.

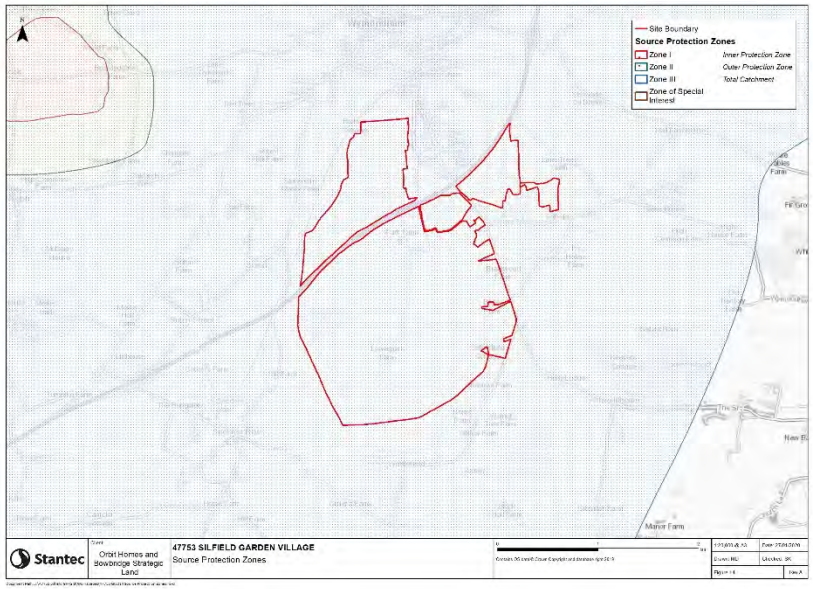


Figure 5: Source Protection Zone

3 Flood Risk and Surface Water Drainage Policy

3.1.1 This section provides an overview of national and local flood risk and surface water drainage policy objectives relevant to the area of study. These form the foundation to the emerging design of which the site will meet. However, it is proposed to assess the future site development in a more sustainable context than what is currently being promoted, both at a national and regional level.

National policy

3.1.2 The National Planning Policy Framework (NPPF) details the current national planning policy for flood risk in England. The NPPF has strict tests to protect people and property from flooding which all local planning authorities are expected to follow. The accompanying Planning Practice Guidance (PPG) to the NPPF advises on how planning can take account of the risk associated with flooding and coastal change.

3.1.3 The online Flood Maps are used to assign a flood risk classification to all land throughout England with the PPG defining the vulnerability of development and land use.

3.1.4 The PPG contains Table 3 (Flood Risk Vulnerability Classification and Flood Zone Compatibility) detailing appropriate development types within each of the flood zones based on the vulnerability classification in addition to further planning requirements (e.g. the Sequential and Exception Test), to assess if the development is at an acceptable risk of flooding.

3.1.5 In accordance with the NPPF and PPG, a Flood Risk Assessment (FRA) will be required as the site is greater than 1 hectare and located within Flood Zones 1, 2 and 3.

3.1.6 The undertaking of the sequential and exception test will also be assessed as part of the planning promotion for the site.

Local policy

Lead Local Flood Authority

3.1.7 Relevant local guidance for flood risk and drainage is contained within Norfolk County Council Lead Local Flood Authority Statutory Consultee for Planning, Guidance Document (Version 4 March 2019) The guidance outlines 8 key policies.

- Policy 1 (Local Flood Risk Guidance) outlines that flood risk must not be increased outside of the site and the most vulnerable development is located within the areas of lowest risk. Additional developments must be flood resilient and resistant with safe access where required.
- Policy 2 (Drainage Hierarchy) describes the hierarchy of drainage discharge types quoted from the NPPF. The hierarchy can be seen below from most preferable to least:
    a. Into the Ground (infiltration);
    b. To a surface water body;
    c. To a surface water sewer;
    d. To a combined sewer.
- Policy 3 (Infiltration Testing Guidance) refers to the BRE 365 Soakaway Design outlining the method of infiltration testing.
- Policy 4 (Runoff Rate) quotes SuDS Non-Statutory Technical Standards (2015) S2 and S3. Describing that the greenfield runoff must not be exceeded for the 1% AEP and 100% AEP.
- Policy 5 (Runoff Volume) Quotes the CIRIA SuDS Manual (C753) “Peak rates of surface water runoff discharged from a development (i.e. relatively impermeable) site, if left uncontrolled, are normally significantly greater than from the site in its greenfield state. This is because most of the runoff drains off the surfaces of the developed site much quicker than the greenfield site and there is much more runoff, as less water is able to penetrate the ground or be intercepted in other ways.”

- Policy 6 (Flood Risk Assessments: Climate Change Allowance) States that the PPG guidance must be followed.

- Policy 7 (Management and Maintenance) states that an appropriate standard of operation of the drainage features is required and that there is clear arrangement in place for ongoing maintenance over the lifetime of the development.

- Policy 8 (Flood Level and Flow Exceedance Management). Firstly, the policy states that the finished floor level and entrances to basements must be 300mm above the 1% AEP. Secondly the policy states that the design should assess the effect of blockages, failure of embankments and higher than standard rainfall events.

South Norfolk Council

3.1.8 The Development Management Policy Document October 2015 outlines the council's policy towards development. The document outlines a key policy, with three sections applicable to drainage and water management.

3.1.9 The first section states that surface water from a proposed development must be fully integrated within the design. The proposed development must also minimise the risk of flooding to the surrounding area and to the site. However, if the ground conditions are not acceptable or there are other exceptional circumstances, then an exception can be made.

3.1.10 The second section states the development must detail how it will contribute to biodiversity and amenity, showing how the drainage integrates with the design. The development must show improvement to amenity and biodiversity.

3.1.11 The final section describes four criteria that must be present within the proposed development:

i. The development must have a neutral or positive effect to surface water flooding and have a sewage capacity assessment. The development must contain drainage features that slow the movement of water.

ii. The development must not reduce water quality and the development must have methods to increase the water quality within the design.

iii. The water design must have separate surface water and foul water drainage systems. The surface water drainage must not discharge into the to a foul drainage connection or combined sewers, unless it can be demonstrated that there is no other option.

iv. The development must utilise soft landscaping and permeable surfaces unless the development can provide justification that it is not feasible.

4 Assessment of Flood Risk

Online Flood Maps

4.1.1 A review of the online Flood Map for Planning shows the site is predominantly located within Flood Zone 1 'Low Probability', as shown below, having less than a 1 in 1000 (0.1%) annual probability of river or sea flooding. However, an area along the western boundary of the site is located within Flood Zone 3 'High Probability'. This area is adjacent to the Bays River (EA) and Bays River (OW) and likely functions as a functional floodplain (see 6 below and **Appendix A**).

4.1.2 Consultation with the EA will be undertaken as part of the future planning application and in developing the vision as set out in Section 6. The flood zone areas are however to remain free from development.

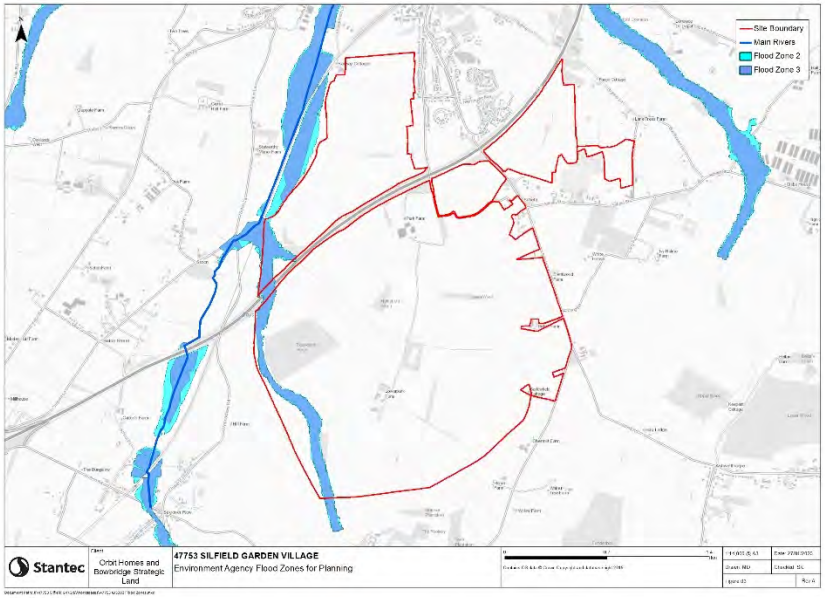


Figure 6: Flood Risk Map for Planning

Surface Water

4.1.3 Fluvial flooding is typically defined as flooding caused by waters in rivers rising above bank levels, while surface flooding (pluvial) is caused by heavy rainfall running off land and ponding in areas of low topography. Flooding is often caused by both sources.

4.1.4 The surface water flood maps from the Gov.UK website show the site has areas of 'low', 'medium' and 'high' risk of flooding. However, most of the site is considered at 'very low' risk to surface water flooding. This is defined as having less than a 1 in 1000 (0.1%) annual probability of flooding.

4.1.5 The definitions for each surface water flood risk category is defined in Table 1 below.

Risk of flooding	Probability
Very low	< 1 in 1000 (0.1%)
Low	1 in 1000 (0.1%) - 1 in 100 (1%).
Medium	1 in 100 (1%) - 1 in 30 (3.3%)
High	>1 in 30 (3.3%)

Table 1: Surface Water Flood Risk Categories

4.1.6 Areas illustrated as being at 'high' risk to surface water flooding are shown located along the channel of the watercourse which flows through the centre of the Southern site and the watercourse located along the western boundary of the Northern site (Bays River EA). This is defined as having more than 1 in 30 (3.3%) annual probability of flooding (refer to **Figure 7** below and **Appendix A**).

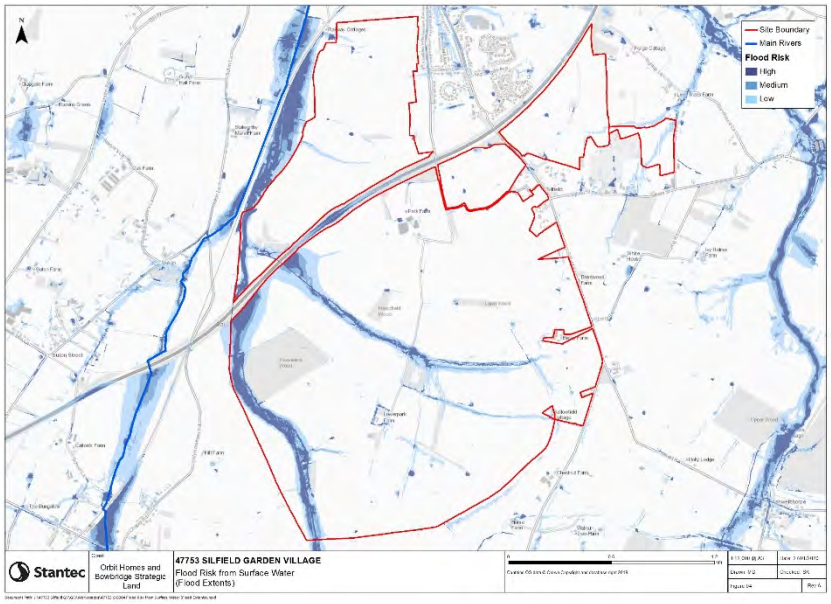


Figure 7: Surface Water Flood Risk Map

4.1.7 The online maps indicate that flood depths along the central ordinary watercourse, within the Southern site, and the ordinary watercourse along the western boundary of the Northern Site could be up to 900mm. The flood risk associated with the Bays River (EA and OW), in proximity to the Northern Site and along the western boundary of the Southern Site (Bays River OW) are shown to exceed 1200mm flood depths (Refer to **Figure 8** opposite and **Appendix A**).

4.1.8 Consultation with the LLFA will be undertaken at the planning application stage to determine if surface water modelling is required to quantify the risks and help inform the future masterplan.

4.1.9 The topography indicates the land is at the head of a fluvial sub-catchment, with watersheds predominately located from the east to the west. The receiving watercourse from this land passes flow predominately to the west to the Bays River (OW and EA). An existing catchment plan showing these watersheds is provided in section 5.

4.1.10 The proposed surface water strategy gives an opportunity to provide some betterment to control rapid agricultural runoff which is likely to be present in the local catchment. The flood risk extent will therefore be reviewed as part of a future planning application and potential modelling of the watercourses to access the surface water extents shown, depths and impact of climate change. It is considered that with the current catchment characteristics and the coarse modelling that tend to be used to inform the production of these flood maps that there is opportunity to reduce the extents shown and make land available as part of the master planning process. This will be confirmed as part of any future works and if necessary, space for flood risk areas will be provided within the emerging masterplan.

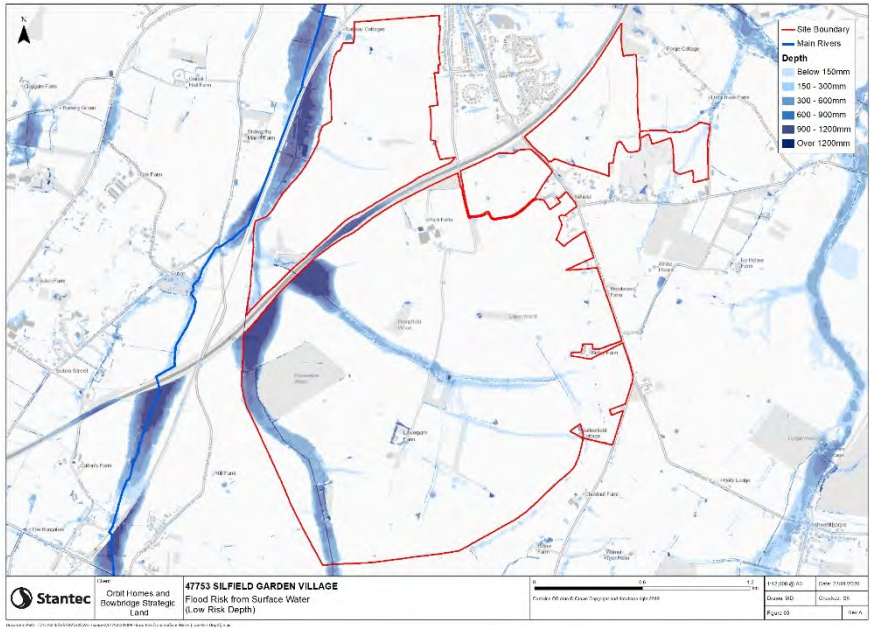


Figure 8: Flood Risk from Surface Water Depths for Low Risk Scenario

4.1.11 Appropriate easements and offsets to the existing watercourses will be incorporated within the emerging masterplan, in accordance with approving stakeholder requirements.

Flood Risk from Reservoirs

4.1.12 **Figure 9** overleaf, is an extract of the Flood Risk from Reservoirs (Also enclosed in **Appendix A**), shows the risk of flooding in the event of a breach from reservoirs containing 25,000 (or above) cubic metres of water. The maps indicate that the site is not located within an area which is considered at risk in the event of reservoir breach.

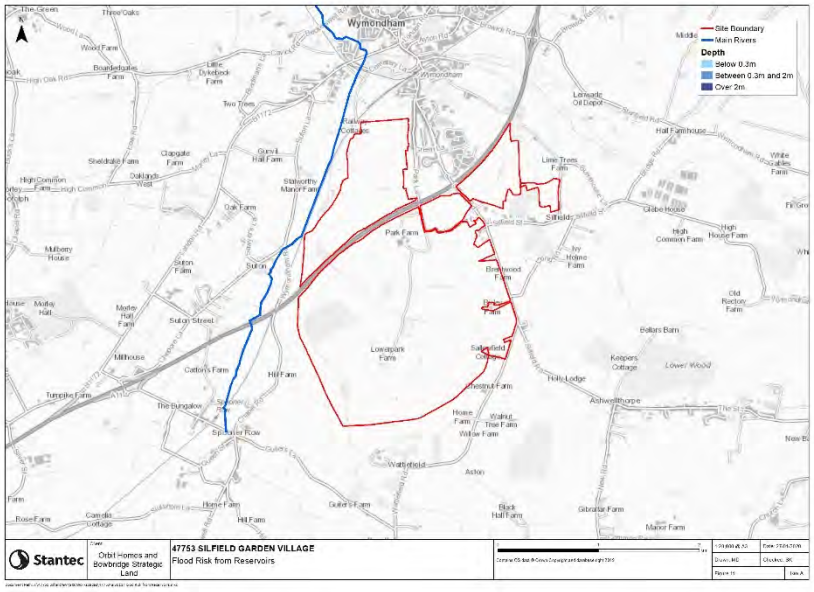


Figure 9: Flood Risk from reservoirs

Groundwater

4.1.13 The Preliminary Flood Risk Assessment (PFRA) does not list ground water flooding within the local area. The Strategic Flood Risk Assessment (SFRA) mentions historic groundwater flooding within Norwich and states that other areas of South Norfolk could also be at similar risk, but this is not specific to a location within South Norfolk.

4.1.14 A review of BGS borehole logs, taken from within the site boundary, shows groundwater levels varies from between 1.4m to 10.8m below ground level. This data only shows a snapshot of the current ground water conditions at the site and does not consider the changes possible due to seasonal variations, or the potential for perched ground water levels within the river terrace deposits which are present at the site.

Borehole Reference	Location	Depth (m)	Water Level (mBGL)	Geological classification of groundwater
TM19NW41	London-Norwich Trunk Road A11 (Centre)	30.00	5.50	Boulder Clay
TM19NW48	London-Norwich Trunk Road A11 (East)	20.50	1.40	Glacial Sands and Gravels
TM19NW36	London-Norwich Trunk Road A11 (West)	12.00	2.10	Boulder Clay
TM19NW12	Wattlefield Hall	45.72	3.66	Boulder Clay
TM19NW8	Stalworthy Farm	26.82	2.74	Glacial Drift (Sand, Clay and Stone)
TG10SW125	East of St. Thomas Drive (North of Site)	20.00	10.80	Chalk
TM19NW22	Bixley Farm	79.25	9.14	Boulder Clay

Table 1: BGS Borehole Records in the vicinity of the site

4.1.15 The possibility for further monitoring will need to be reviewed as part of any future works and discussed with stakeholders. Based on the current information made available it is considered that the site is at a low risk of groundwater flooding, however this will be confirmed as part of any future studies for the site.

Sewer Flooding

4.1.16 Anglian Water plans for the site indicate there are no surface water or foul sewers located within the site. The asset plans are provided in **Appendix B**. It is therefore considered that the risk of flooding from sewers is low.

Canals, Ponds and other water features

4.1.17 There are no canals or other artificial watercourses located within the site boundary or immediate vicinity. The risk posed by the ordinary watercourses in the site is assessed in the surface water section detailed above.

4.1.16 Some waterbodies such as ponds are noted within the redline boundary and are generally confined within proximity to existing buildings within the site. These are considered to be of low risk but will be investigated further as part of a future planning application.

Climate Change

4.1.17 The north west area of the site is in Flood Zones 2 and 3, medium and high probability of flooding due to the Bays River and an ordinary watercourse which runs parallel to the western site boundary. It is being proposed for this part of the site to remain free from development as it does not currently consider the impact from climate change.

4.1.18 With regards to anticipated changes in peak rainfall intensity due to climate change, NCC require a 20% increase in rainfall intensities to be used for design purposes to assess the impact on the surface water drainage network. A 40% increase in rainfall intensities will be used to assess the potential flood risk implications in the design rainfall event including whether there is any increased flood risk to third parties as a result of the development.

4.1.19 The proposed drainage strategy (see section 6) will be designed to consider climate change. There will betterment in runoff rates leaving the site in high order rainfall events as the current proposal is to limit to Qbar, which is equivalent to approximately the 1in 2.33 annual probability event.

5 Surface Water Strategy Vision

Overview

5.1.1 As the LLFA, Norfolk County Council are responsible for the approval of surface water drainage systems within new major development.

5.1.2 Major development, as defined within the Town and Country Planning Act (1990), consists of any of the following:

a) the provision of dwelling houses where residential development of 10 or more units; or where the development is to be carried out on a site having an area of 0.5 hectares or more and the number of units is not known;

b) the provision of a building or buildings where the floor space to be created by the development is 1,000 square metres or more; or

c) development carried out on a site having an area of 1 hectare or more.

5.1.3 The following section provides an overview of the existing surface water drainage arrangements and the proposed strategy for the management of surface water from the new development.

Overview

5.1.4 The National Planning Policy Framework (NPPF) Planning Practice Guidance (PPG) sets out a hierarchy for surface water disposal (consistent with the Building Regulations H3) as follows:

a. Into the Ground (infiltration);

b. To a surface water body;

c. To a surface water sewer;

d. To a combined sewer.

Suitability for Infiltration

5.1.5 The site is assumed to have poor infiltration potential based on the identified soil association type and recorded geology. However, consultation will be carried out with the LLFA at planning stage to establish whether infiltration testing is required.

Suitability for Discharge to Waterbody

5.1.6 When infiltration is not deemed to be feasible, discharge to a watercourse is the next preferred option. There are two watercourses within the site which the development can discharge to. At this stage, an outfall to these watercourses is considered the most appropriate method of surface water disposal. As this is a greenfield site the LLFA will require the discharge rates to be restricted to equivalent greenfield rates.

5.1.7 As the watercourses are not considered to receive external offsite flow, there is some increased flexibility to realign these features to allow for the development of the site but to also facilitate opportunities to drain to these features and make them enhanced green and blue corridors through the site and align with the emerging ecological strategy for the site.

5.1.8 Any works to the form of the watercourses will be undertaken in agreement with the approving authorities and ensure there is no detriment to offsite areas, but they will be designed to manage the existing Surface Water risk and will provide conveyance, attenuation and enhanced biodiversity.

Suitability to a Surface Water Sewer/ Combined

5.1.9 The sewer plans show there is no local surface sewers / combined sewers within the site. It is proposed to discharge surface water to the existing watercourses and waterbodies located throughout or adjacent to the site. If it is determined at the planning stage that discharge to the local surface water sewers are required, this will be in agreement with Anglian Water.

Greenfield Runoff Rates

5.1.10 The greenfield runoff rate was estimated using the FEH Statistical method based on catchment descriptors for the site. This method resulted in a Q_{BAR} (approximately 1 in 2.33 annual probability event) greenfield runoff rate of the following:

- 1.4 l/s/ha for the Northern Site
- 1.7 l/s/ha for the Southern Sites.

5.1.11 Refer to **Appendix C** for the supporting Greenfield Runoff calculations. The LLFA will expect this to be applied to the site.

5.1.12 The catchments and watersheds applicable to the existing site are illustrated in **Figure 10** below:

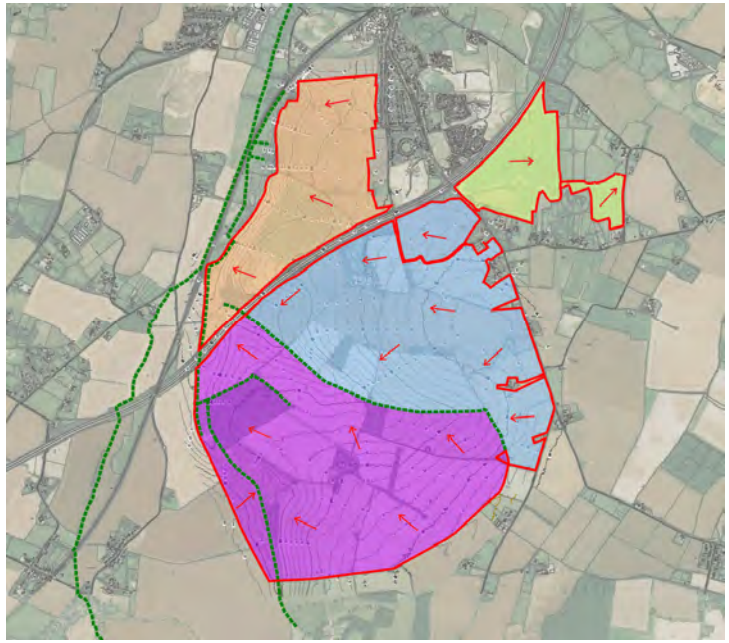


Figure 10: Existing Catchment Plan

Sustainable Drainage Systems (SuDS)

5.1.13 It is a requirement of the NPPF that SuDS are used in all major developments, if feasible. The LLFA also advocates the use of appropriate SuDS in new developments as detailed in the Norfolk County Council Lead Local Flood Authority Statutory Consultee for Planning, Version 4 March 2019.

5.1.14 CIRIA report C753 'The SuDS Manual' outlines the various types of SuDS, their benefits and limitations, and design considerations associated with each. Not all SuDS components/methods are feasible or appropriate for all developments, factors such as available space, ground conditions and site gradient will influence the feasibility of different methods for a development.

5.1.15 The proposal is for a NetZero Garden Community, therefore the SUDS will play an important role as part of helping to achieve this target. Key to this will be to reduce the amount of water use on the site and therefore rainwater harvesting and grey water reuse will form an integral part of the development proposals.

5.1.16 At this stage it is anticipated the SuDS features proposed at the site will be widely dispersed throughout the development.

5.1.17 The design and the integration of proposed SuDS features within the wider landscape strategy and proposals will be carefully considered as part of the masterplanning process and shall themselves, provide an element of Public Open Space use.

5.1.18 The site already has a number of landscape features including woodlands, ponds and watercourses which are proposed to be retained and enhanced where possible therefore, the SuDS proposals shall be designed to ensure they enhance and support the landscape proposals going forward.

5.1.19 The proposed SuDS seek to deliver long term mitigation by attenuating and treating the development generated surface water runoff and where possible provide betterment to the receiving watercourse. SuDS will be designed so they are integrated within the wider landscape proposals and will provide opportunities, where possible, to enhance biodiversity and recreation facilities.

5.1.20 As well as providing a drainage function, the SuDS will also form an important part of the project's biodiversity strategy. The proposed SuDS features will be designed so that they maximise opportunities for habitat creation.

5.1.21 The prevailing surface water strategy to be adopted is a network of positive drainage, where feasible consisting of and not limited to:

- Open swales / rills, that can be effectively integrated into the landscape / streetscape and be wet, dry, or for storage purposes. As shown in **Figure 11**, these can be combined with residential roads to intercept and treat runoff at source, and both provide ecological and amenity benefits as well as effective water quality treatment.

Figure 11: Open swale / Rills Examples

- Attenuation Basins, **Figure 12**, are designed to hold back stormwater to prolong the event and reduce peak flows, then slowly release flows into the system. They are multifunctional features that can additionally be used for community spaces and increase amenity and biological value;

Figure 12: Attenuation Basin Examples

- Wetland planting and Ponds, **Figure 13**, ideally incorporated as part of the green / blue corridors within the development. Opportunities will be explored to locate these features within the existing watercourse boundaries. They can provide multiple uses, such as for amenity space, biological enhancement and can be integrated with other SuDS or blue / green infrastructure.

  Water quality treatement can be effectively managed using these features through apporiate planting and used as part of a wider SuDS Management Train.

Figure 13: Wetland planting and Ponds Examples

- Porous Paving, as shown in **Figure 14**, to allow water to infiltrate into the ground (where feasible) to feed into groundwater aquifers or can be lined to aid water quality treatment and reduce runoff intensity into the drainage system;

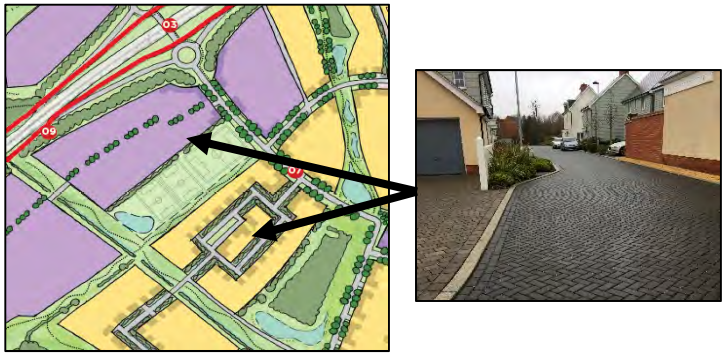


Figure 14: Porous Paving Examples

- Bio-retention areas (**Figure 15),** included in development areas and strategic landscaping areas. Planting effectively provides benefits to the communities through amenity, biodiversity and water quality treatment.

Figure 15: Bio-retention Areas Examples

5.1.22 Piped networks may still be utilised in areas subject to LLFA, Highways and Sewerage undertaker adoption requirements.

5.1.23 Opportunities will also be explored at the planning stage for green roofs and the containment of any commercial/ industrial surface water re-use, such as rainwater harvesting (for either internal or external uses) and water cooling-systems. This is subject to the development end use, the effectiveness and viability of such systems and regulatory requirements.

5.1.24 Rainwater harvesting and greywater reuse will be assessed as part of the planning application stages to ensure NetZero targets are being achieved and the demand on water supplies are reduced.

Attenuation Storage Requirements

5.1.25 The percentage of impermeable area has been taken as 55% for residential areas. This will be reviewed as development proposals progress.

5.1.26 WinDes Quick Storage Estimates have been undertaken to provide an indication of the volume of storage that would likely be required on site to provide the necessary attenuation based upon rainfall events up to the 1% (1 in 100) annual probability event plus, an additional allowance of 20% and 40% on rainfall intensity, which is to account for the potential impacts of climate change. The climate change allowance is based on the latest Environment Agency *Flood Risk Assessments: Climate Change Allowances* (February 2016, updated Dec 2019).

5.1.27 The proposed final developable area for the future works is not yet known as this is a high-level review in support of the local plan promotion stage. Therefore the amount of storage approximately required for every 1ha of impermeable area has been calculated to be the following:

- 1425m^3 per ha for the Northern Site
- 1425m^3 per ha for the Southern Site

5.1.28 This is based on the site applicable greenfield Q_{BAR} runoff rate of 1.4 l/s/ha for the northern site and 1.7l/s for the southern site for a 1% annual probability rainfall event including an allowance for climate change of 40% (see calculations in **Appendix C**).

5.1.29 The calculations are only approximate estimates which can only be used at this high-level stage. The locations of strategic attenuation basins are illustrated indicatively. It is anticipated this storage will be supported with more dispersed storage once a masterplan is progressed in the planning stages.

5.1.30 The maximum stored water depth to achieve a gravity outfall will also need to be confirmed at planning stage requiring a review of survey data of the local land drainage network.

5.1.31 The size of any proposed attenuation features will be affected by earthworks that may take place as part of the development proposals and further drainage modelling.

Exceedance

5.1.32 To demonstrate that in an exceedance event any flooding does not negatively affect the development or offsite areas, flows up to the 1 in 100 (1%) annual probability plus climate change rainfall event will be managed and contained onsite. Furthermore, the attenuation will be designed to accommodate surface water runoff with no flooding for all events up to and including the 1 in 100 (1%) annual probability plus 40% climate change event.

Water Quality and Pollution Control

5.1.33 Appropriate pollution control measures must be included in the surface water drainage system to minimise the risk of contamination or pollution entering the receiving watercourse and aquifer from surface water runoff from the development.

5.1.34 The drainage system will be designed to comply with the requirements of the SuDS treatment train as laid out in CIRIA C753 'The SuDS Manual', described as the 'Simple Index' Approach, in addition to the Norfolk County Council Lead Local Flood Authority Statutory Consultee for Planning, Guidance Document (Version 4 March 2019) document and the Local Plan.

5.1.35 A SuDS treatment train will be applied for each catchment whereby runoff passes through a variety of SuDS techniques to control volumes of runoff and reduce pollution before discharge to a watercourse.

5.1.36 The treatment of surface water runoff will be designed to ensure it meets the requirements of the Water Framework Directive (WFD) with not detriment to the receiving watercourses.

Works to or diversion of Ordinary watercourse

5.1.37 The watercourses which crosses through the Southern Site are proposed to remain and be enhanced through suitable planting.

5.1.38 It might be necessary to cross these watercourses or divert in some areas to suit the development proposals. The LLFA will be consulted over these proposals and it is understood this may require a formal land drainage consent in accordance with Section 23 of the Land Drainage Act 1991.

Adoption and Maintenance

5.1.39 It is assumed that the surface water infrastructure will be designed to adoptable standards and adopted either by Anglian Water, ICOSA or a private management company. The upcoming release of Sewers for Adoption 8th Edition highlights a change in approach whereby sewerage companies including Anglian Water are open to adopting SuDS features provided they meet expected design standards.

5.1.40 Norfolk County Council Lead Local Flood Authority Statutory Consultee for Planning, Guidance Document (Version 4 March 2019) provides outline guidance on how SuDS features should be designed.

6 Conclusions and Recommendations

6.1.1 Silfield Garden Village presents an opportunity to deliver strategic growth without causing a detriment to flood risk. The site provides the opportunity to deliver sustainable growth considering the following:

- A large portion of the site is located within Flood Zone 1 of the "Flood Map for Planning", which is appropriate for all types of development.
- Flood Zones 2 and 3, medium and high probability of flooding are shown at the site but are mainly constrained to the north-west area of the site and within watercourse extents along the western boundary.
- The sequential approach is to be adopted at the site whereby development is located in areas with the lowest risk of flooding. It is proposed for the flood zone areas to remain free from development. Appropriate easements will also be applied to the watercourses within the site to ensure they remain free from development and future maintenance access can be retained.
- Infiltration drainage is unlikely to be feasible and this will be confirmed as part of the future works in consultation with the NCC as LLFA.
- The site has the potential to support a range of sustainable measures to manage and control surface water run-off, with the view to deliver an integrated Sustainable Drainage System (SuDS). These features will be fully joined up with ecology/habitat areas, green infrastructure, and public open space. Rather than creating simple functional 'drainage features', this integrated approach will contribute to habitat creation and enhance biodiversity, provide multi-functional amenity space, and preserve water quality. This is in line with national and local guidance.
- The volume of surface water being discharged from the development will be carefully controlled to replicate the drainage regime of the existing site in accordance with the Lead Local Flood Authority (Norfolk County Council) surface water drainage design requirements and local planning authority, so as not to cause any increase in on- or off-site flood risk.
- The SuDS will ensure there is no increase in discharge rates from the site but will also improve water quality discharge, using the principles from the SuDS Manual. Provisional rates have been provided within this appraisal.
- The proposal is for a NetZero Garden Community, therefore the SUDS will play an important role as part of helping to achieve this target. Key to this will be to reduce the amount of water use on the site and therefore rainwater harvesting and grey water reuse will form an integral part of the development proposals.
- It is estimated attenuation storage in the order of 1425m^3 for the northern site and 1370m^3 for the southern sites per impermeable hectare could be required to attenuate runoff up to the 1 in 100 annual probability plus 40% climate change event prior to discharge.

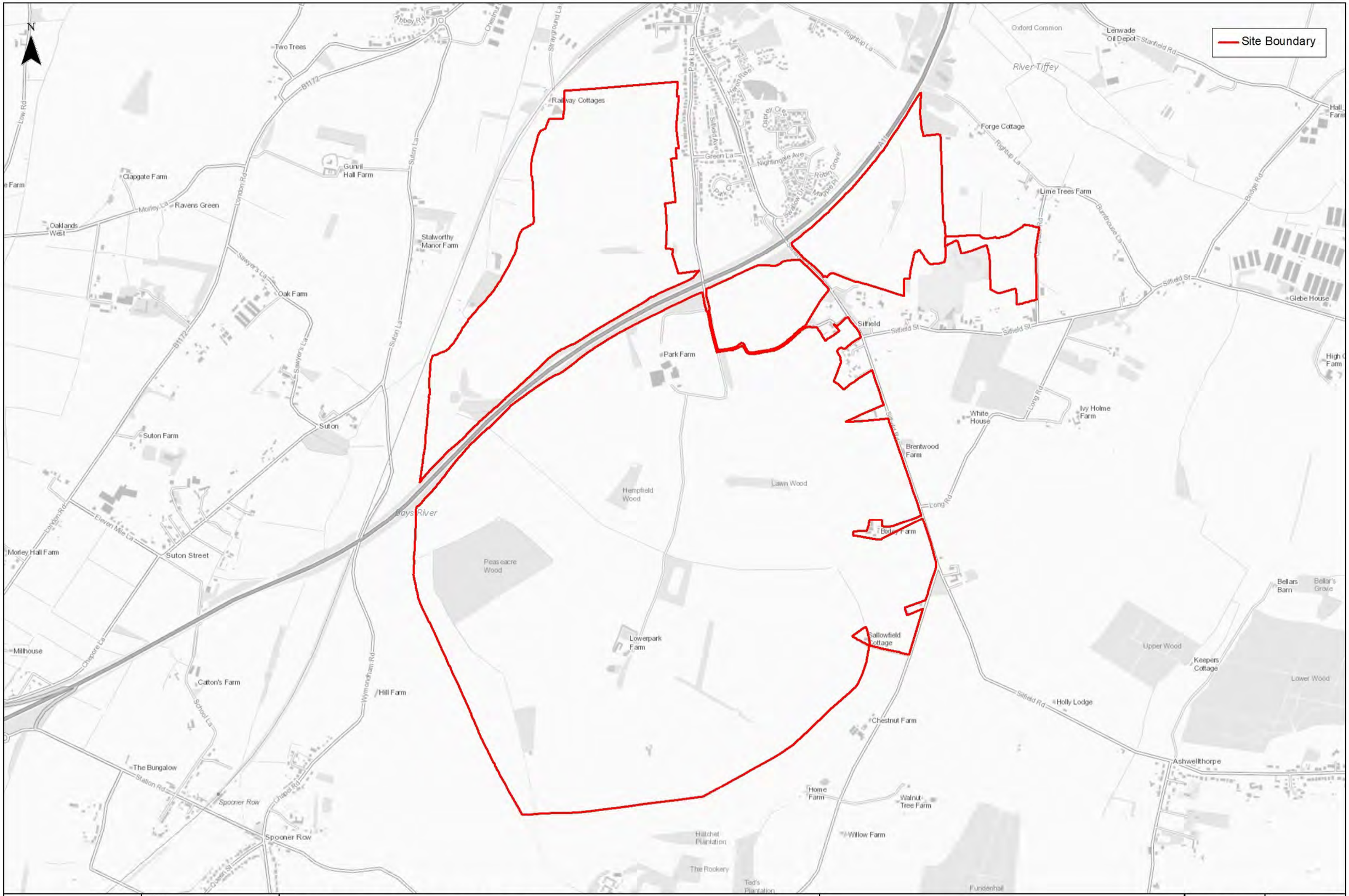
6.1.2 The site generated surface water flows are attenuated and managed on site and can provide betterment to existing flood risk in the receiving watercourses. Space for water are highlighted in the indicative masterplan, which can be developed and delivered in accordance with the relevant SuDS guidance, the approving stakeholder requirements and normal flood prevention design parameters.

6.1.3 Anglian Water have acknowledged their obligation to accept the necessary foul flows from the development should planning consent be granted. Therefore, as part of the planning application further consultation with Anglian Water will be undertaken to ensure the necessary steps are taken to ensure there is enough treatment capacity following the planning consent.

6.1.4 Overall the site is well positioned to deliver housing and commercial needs and the development will meet the requirements of both national and regional planning policy.

7 Appendices

Appendix A - Figures



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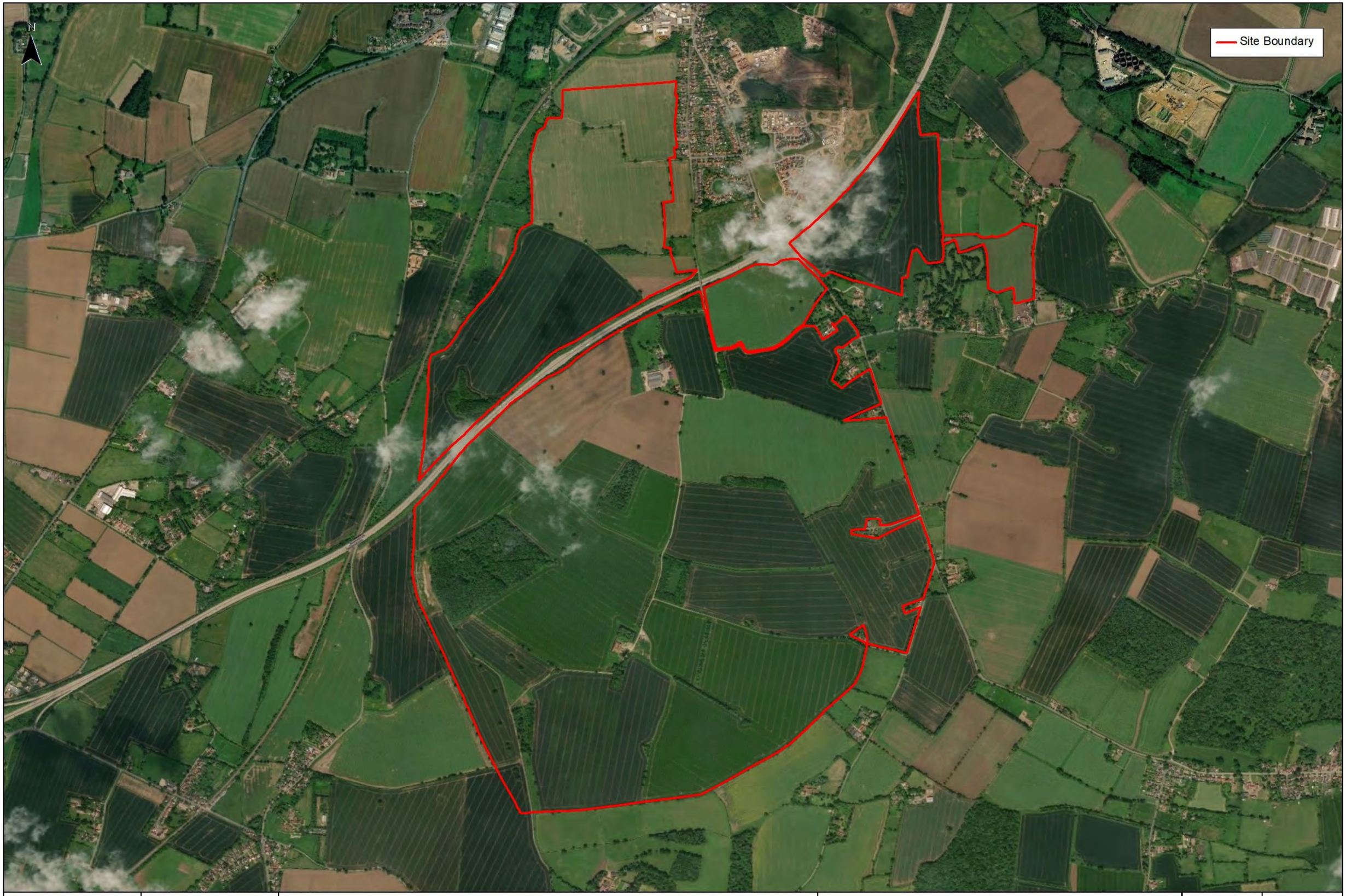

Stantec

Client: Orbit Homes and Bowbridge Strategic Land

47753 SILFIELD GARDEN VILLAGE

Site Location (Aerial)

0 0.7 1.4 km

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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Figure 01b	Rev A

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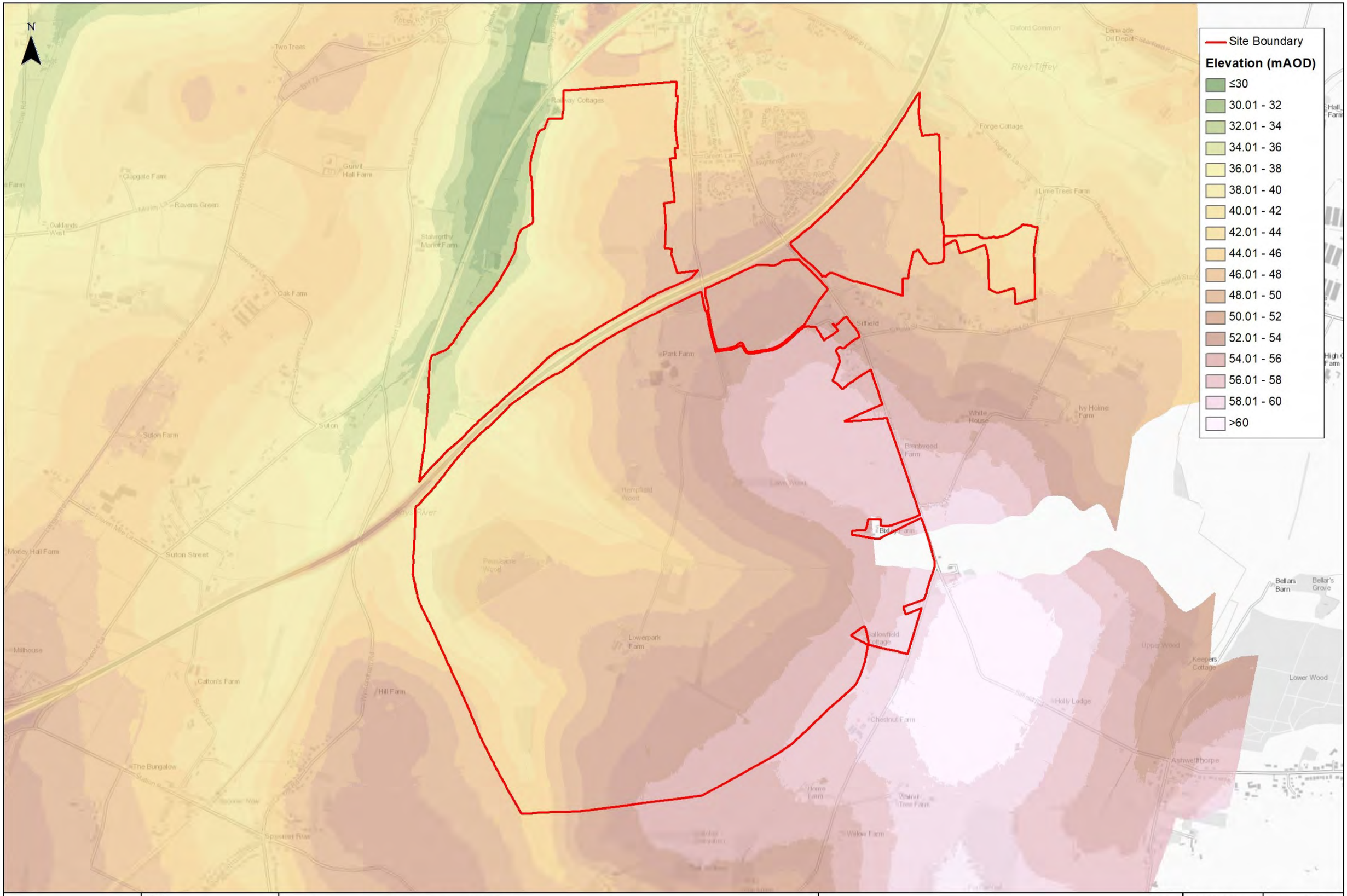

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				Drawn: MD	Checked: SK
				Figure 02	Rev A

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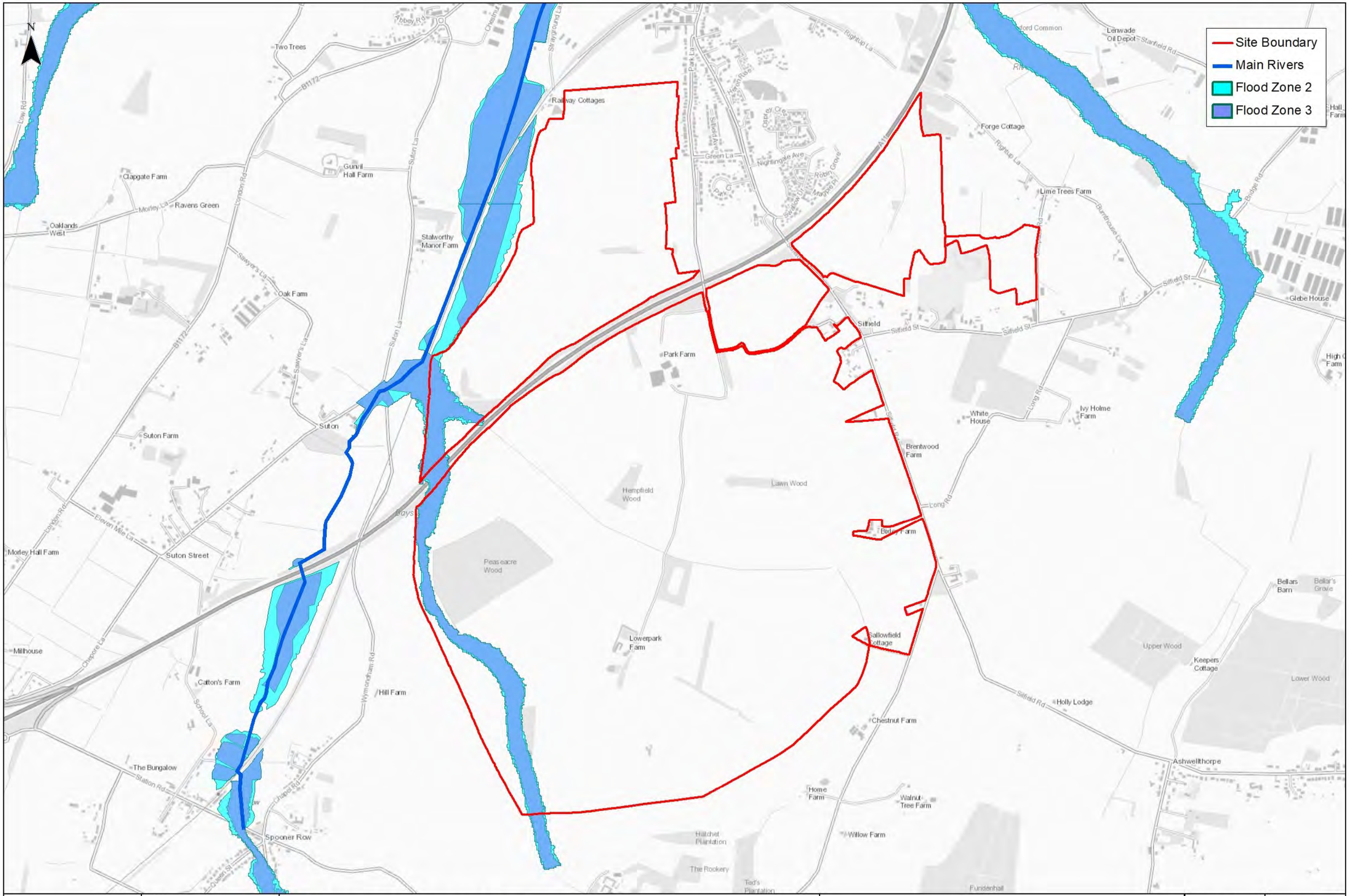

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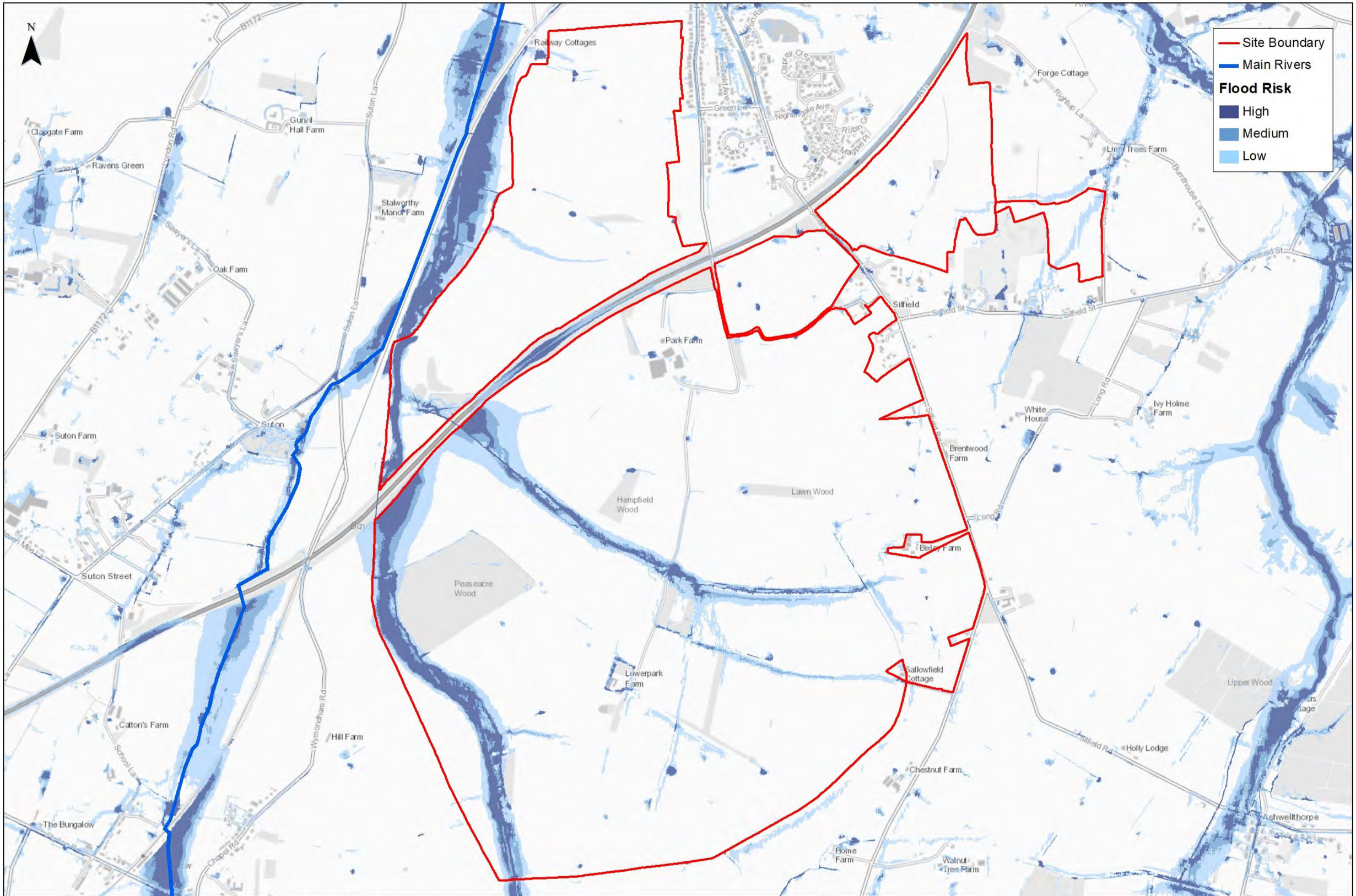

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Client: Orbit Homes and Bowbridge Strategic Land

47753 SILFIELD GARDEN VILLAGE

Flood Risk from Surface Water (Flood Extents)

0 0.6 1.2 km

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Figure 04 | Rev A

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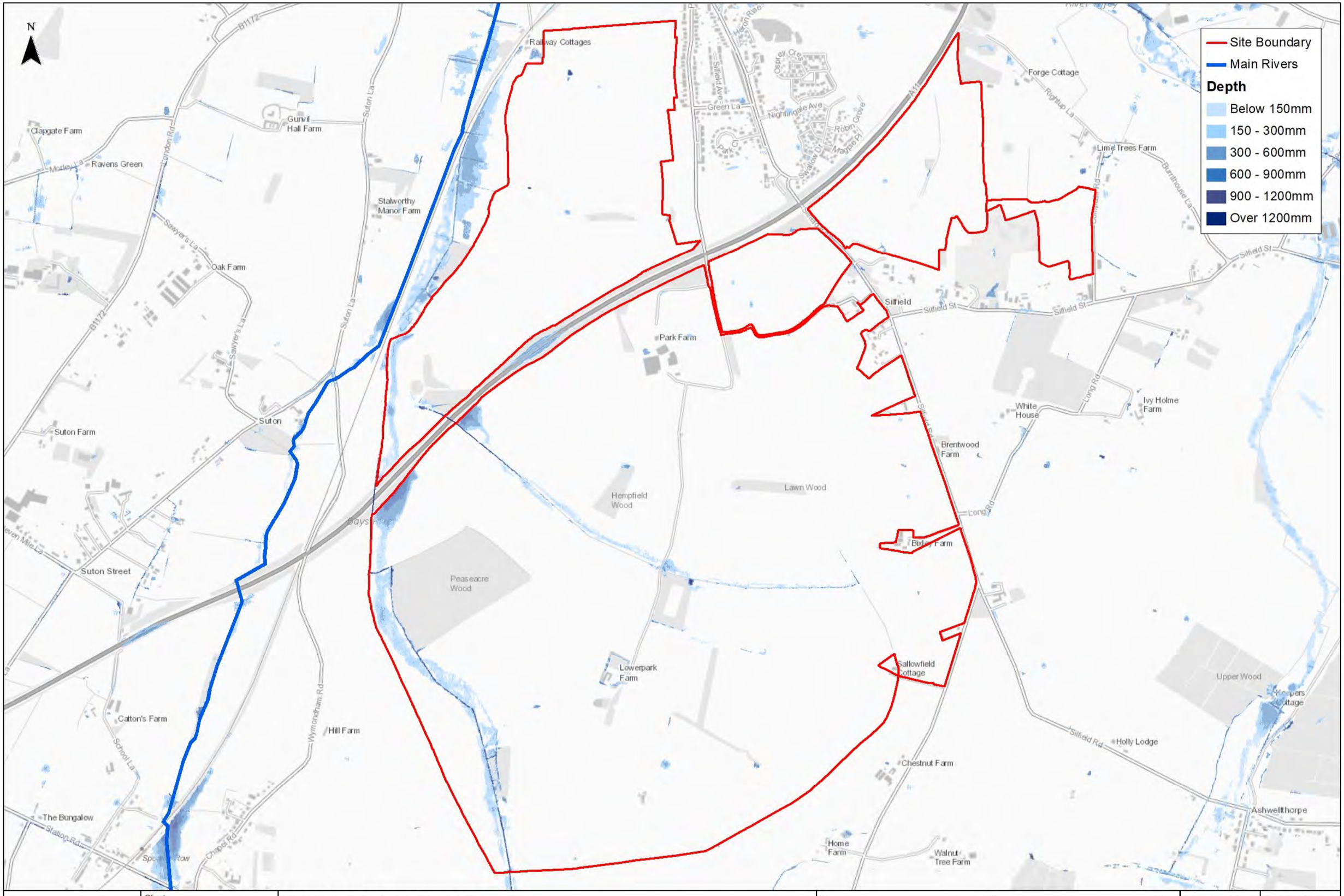

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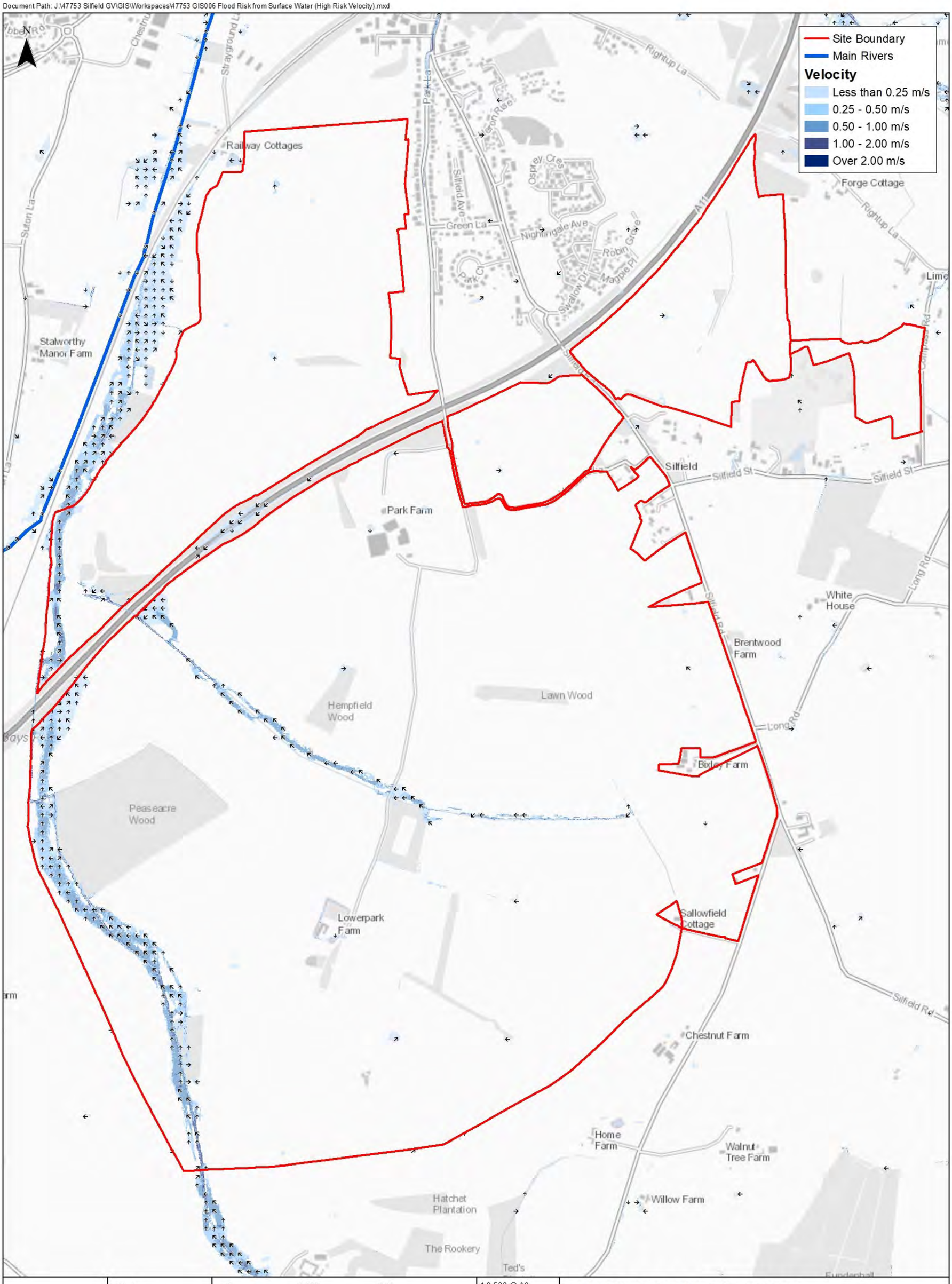

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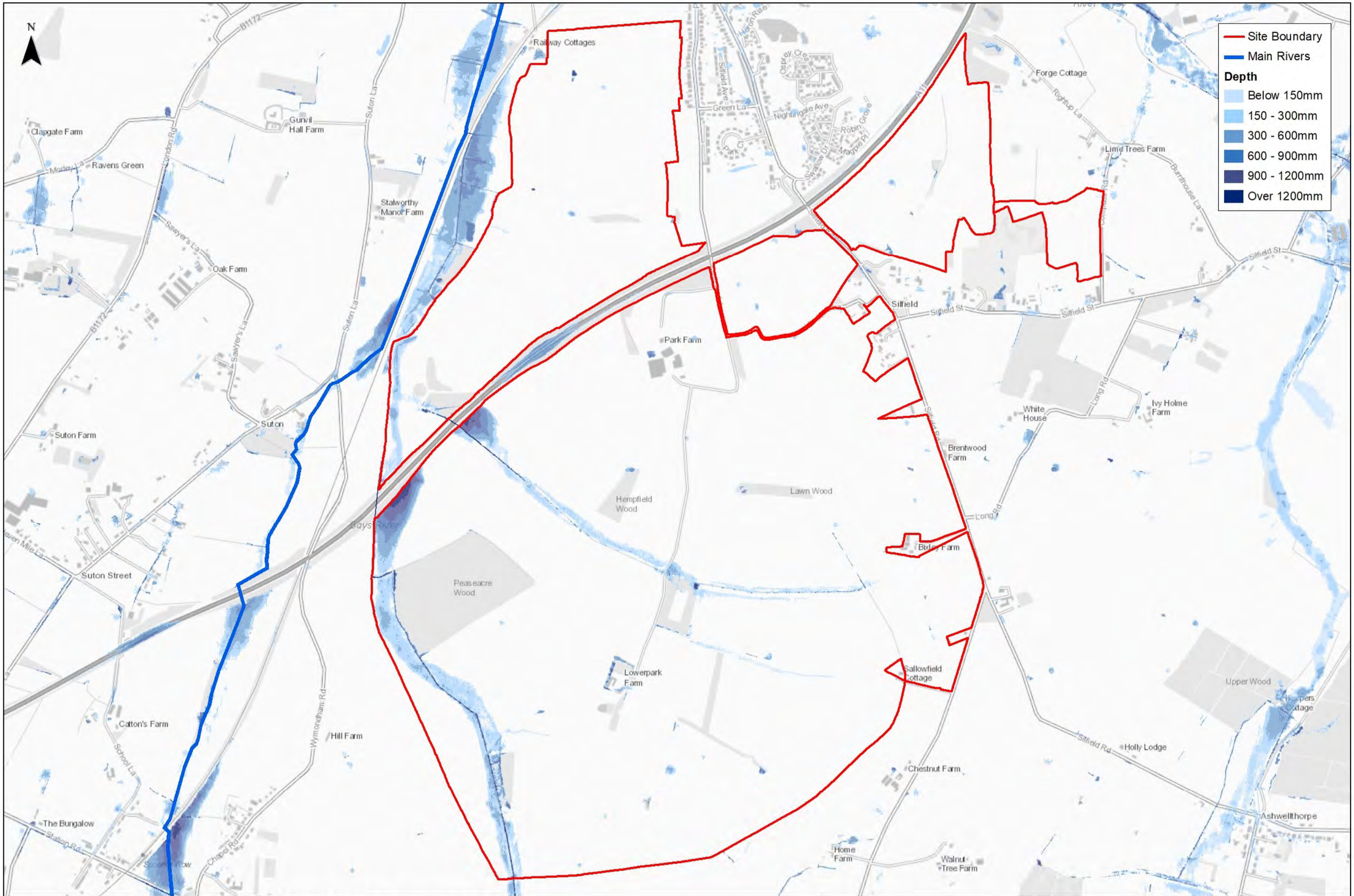

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Client: Orbit Homes and Bowbridge Strategic Land

47753 SILFIELD GARDEN VILLAGE

Flood Risk from Surface Water (Medium Risk Depth)

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Figure 07 | Rev A

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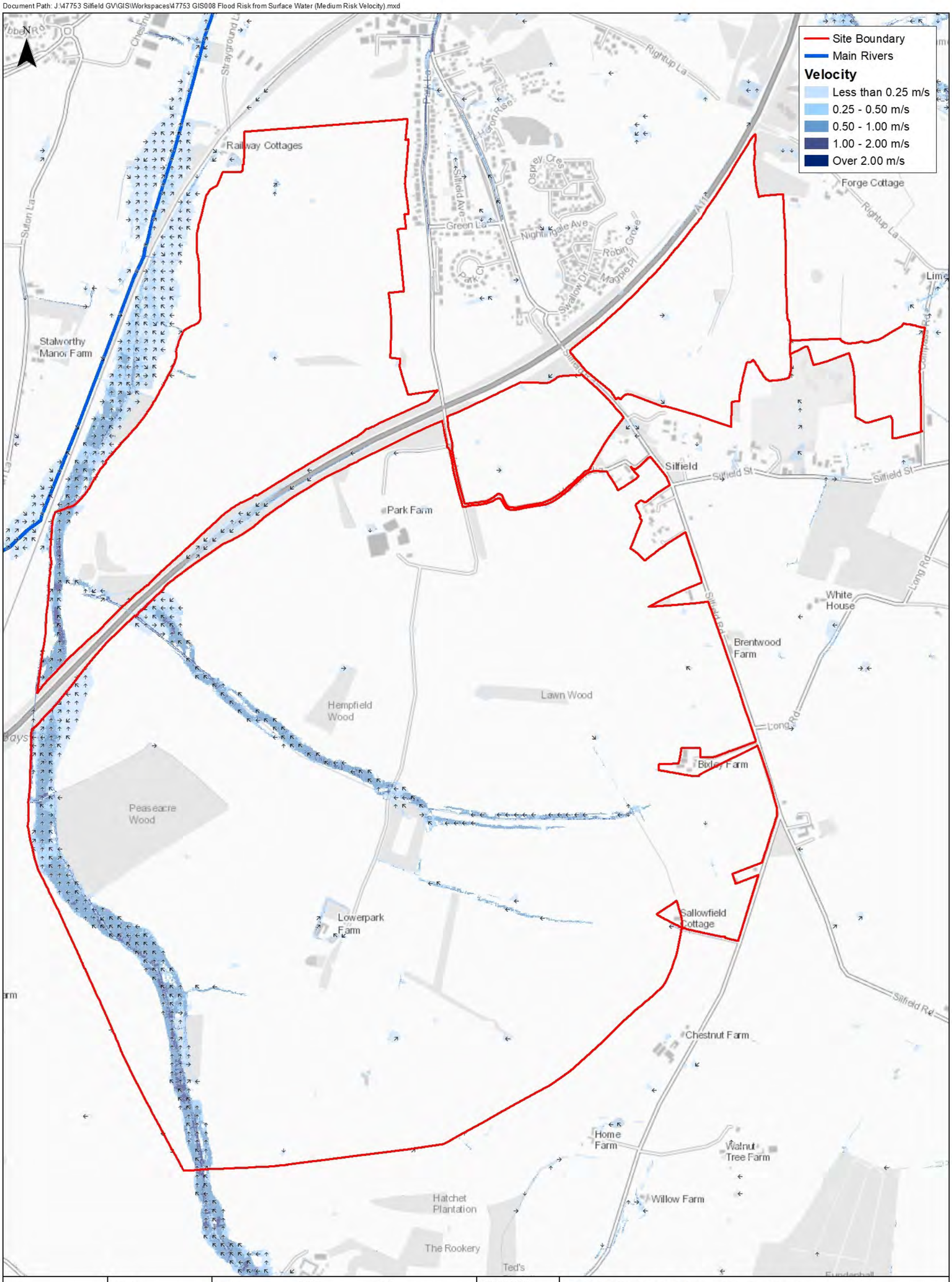

Stantec

Client: Orbit Homes and Bowbridge Strategic Land

0 0.225 0.45 Km

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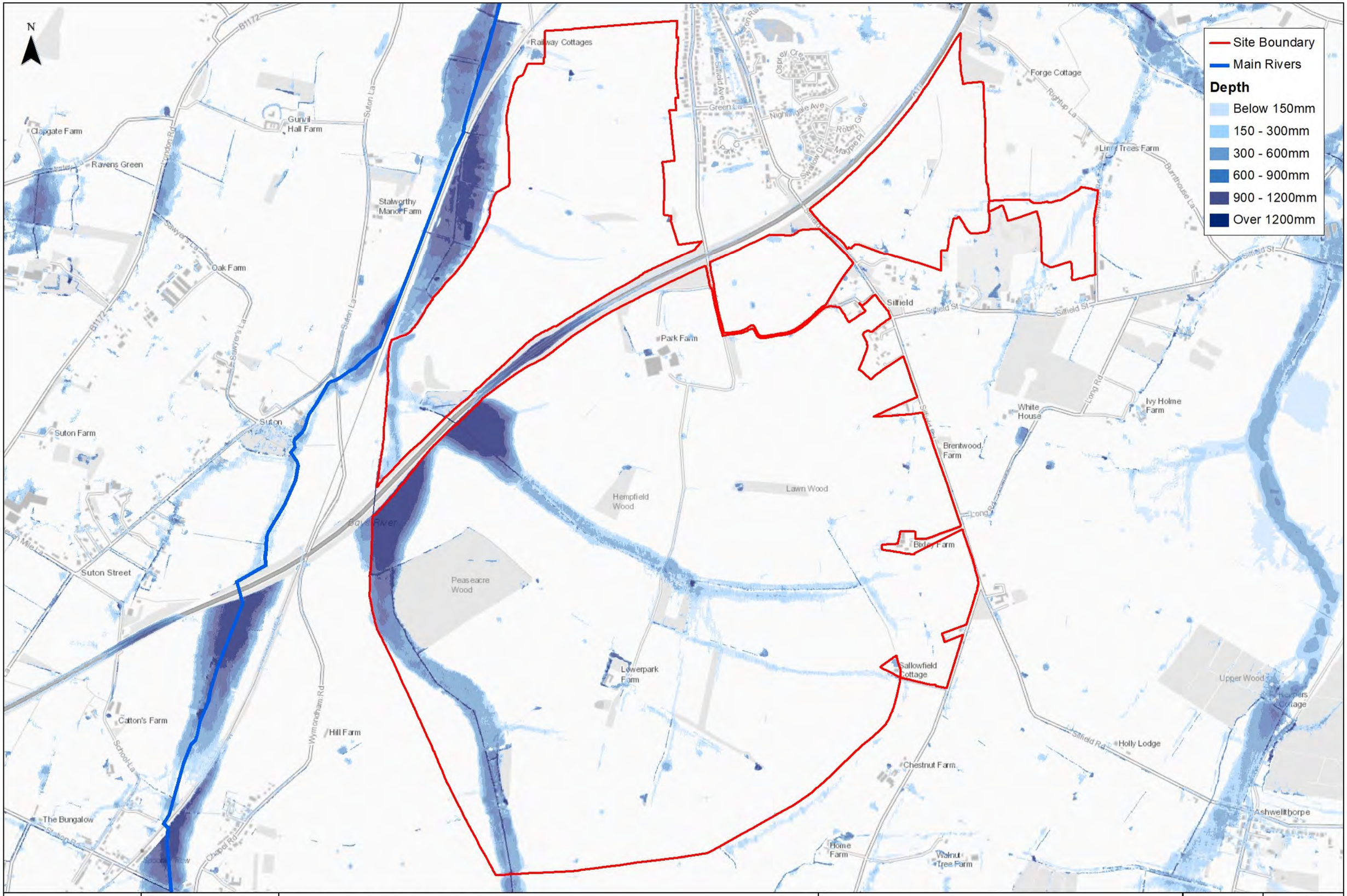
47753 SILFIELD GARDEN VILLAGE

Flood Risk from Surface Water (Medium Risk Velocity)

Figure 08 | Rev A



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Document Path: J:\47753 Silfield GV\GIS\Workspaces\47753 GIS009 Flood Risk from Surface Water (Low Risk Depth).mxd

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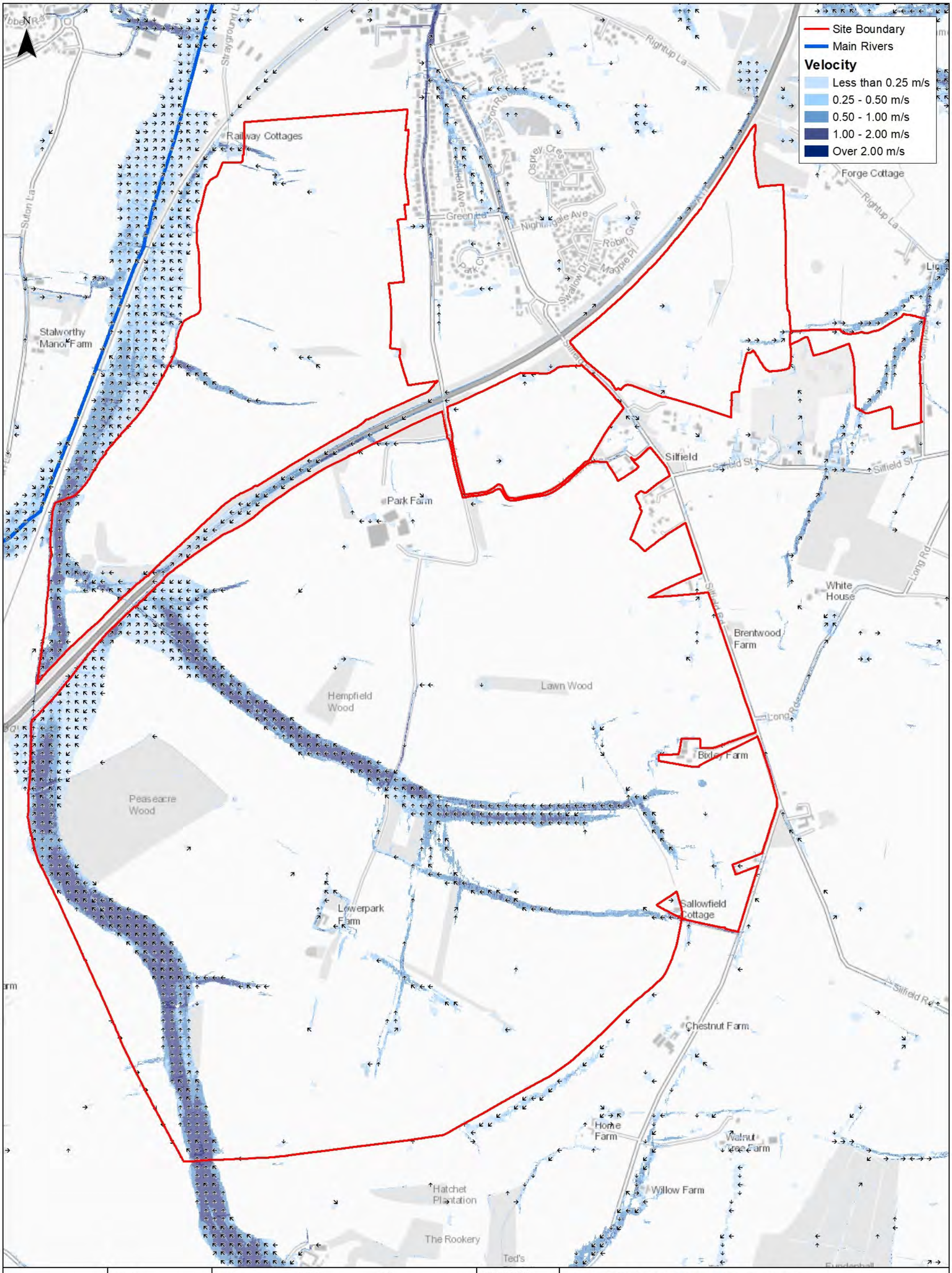
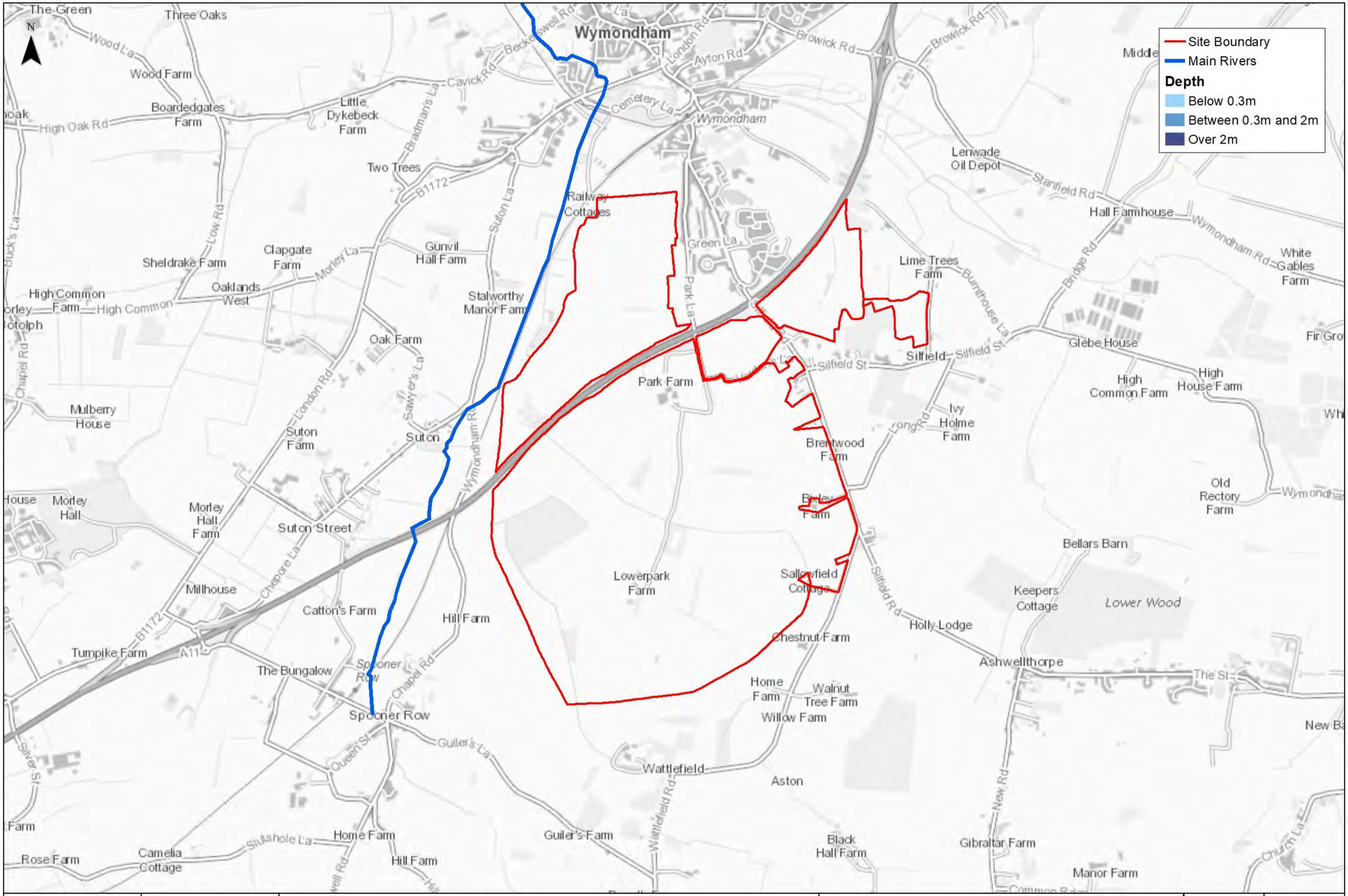


Stantec	Client: Orbit Homes and Bowbridge Strategic Land	0 0.225 0.45 Km Service Layer Credits: Contains OS data © Crown Copyright and database right 2019	1:9,500 @ A3 13/03/2020 Drawn: MD Checked: SK	**47753 SILFIELD GARDEN VILLAGE** Flood Risk from Surface Water (Low Risk Velocity) Figure 10 | Rev A



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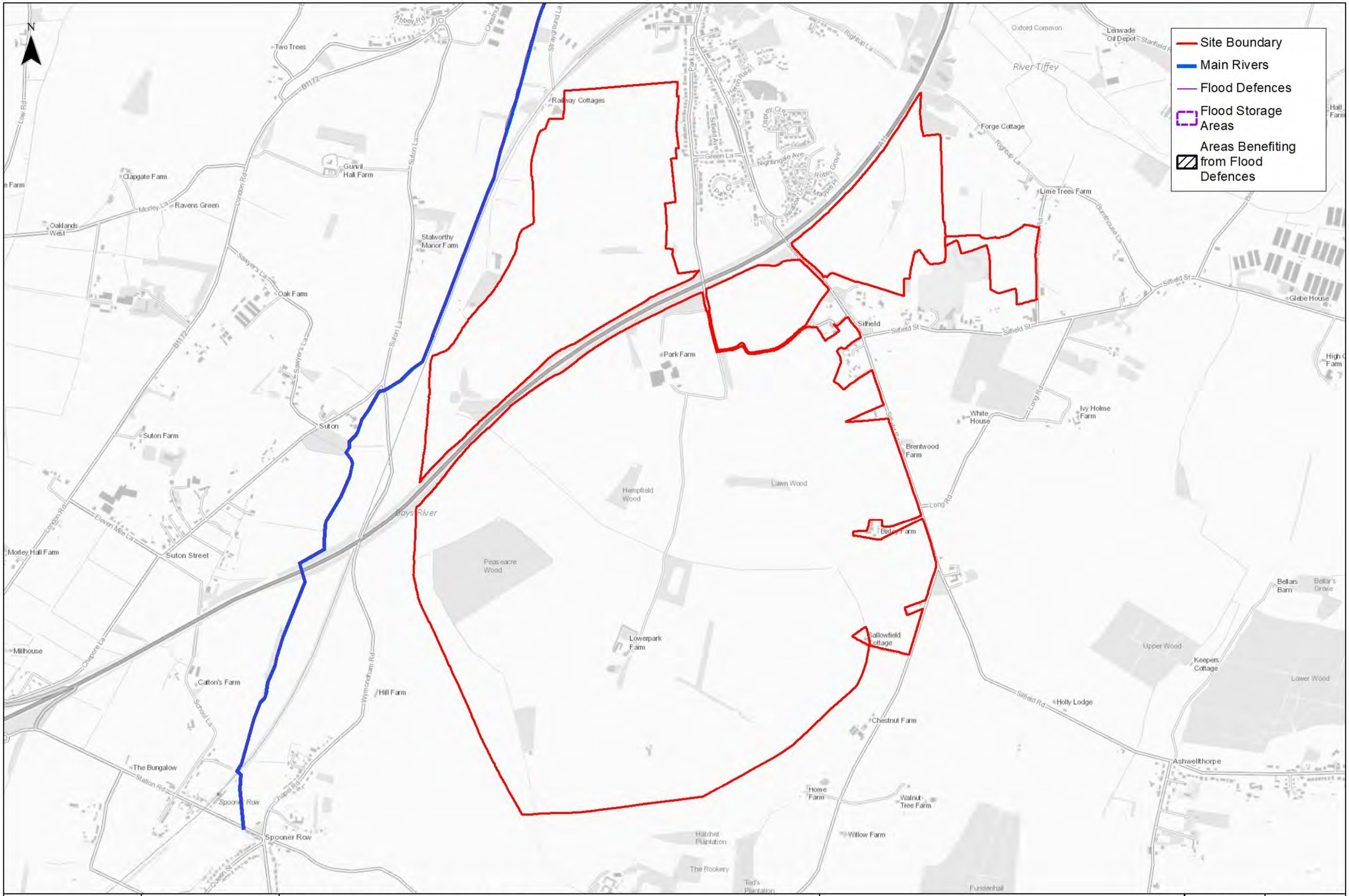

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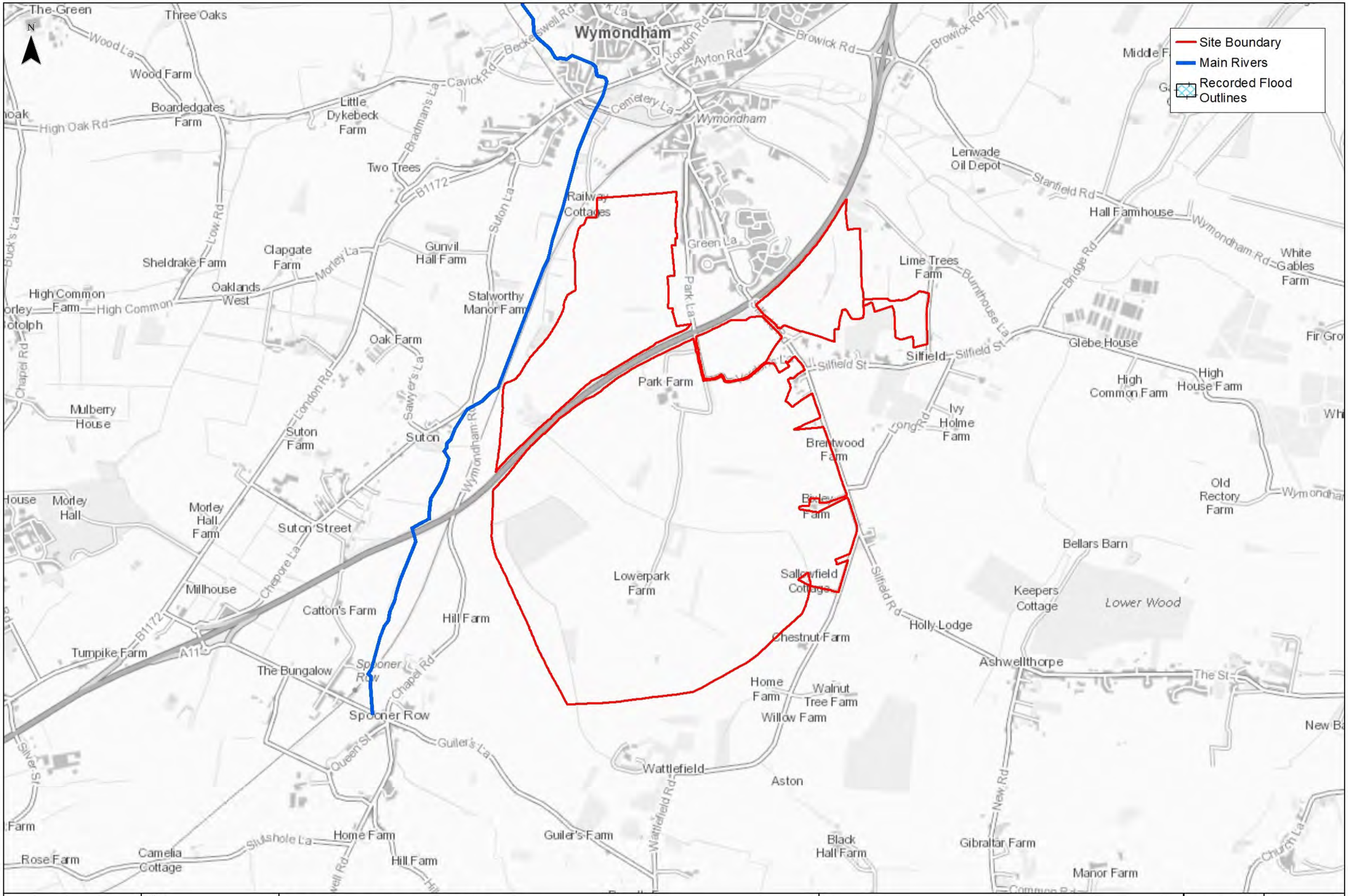

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N

Site Boundary

Source Protection Zones

Zone I	*Inner Protection Zone*
Zone II	*Outer Protection Zone*
Zone III	*Total Catchment*
Zone of Special Interest	

Wymondham

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0 1 2 km

Stantec	Client: Orbit Homes and Bowbridge Strategic Land	**47753 SILFIELD GARDEN VILLAGE** Source Protection Zones	1:20,000 @ A3	Date: 27/01/2020
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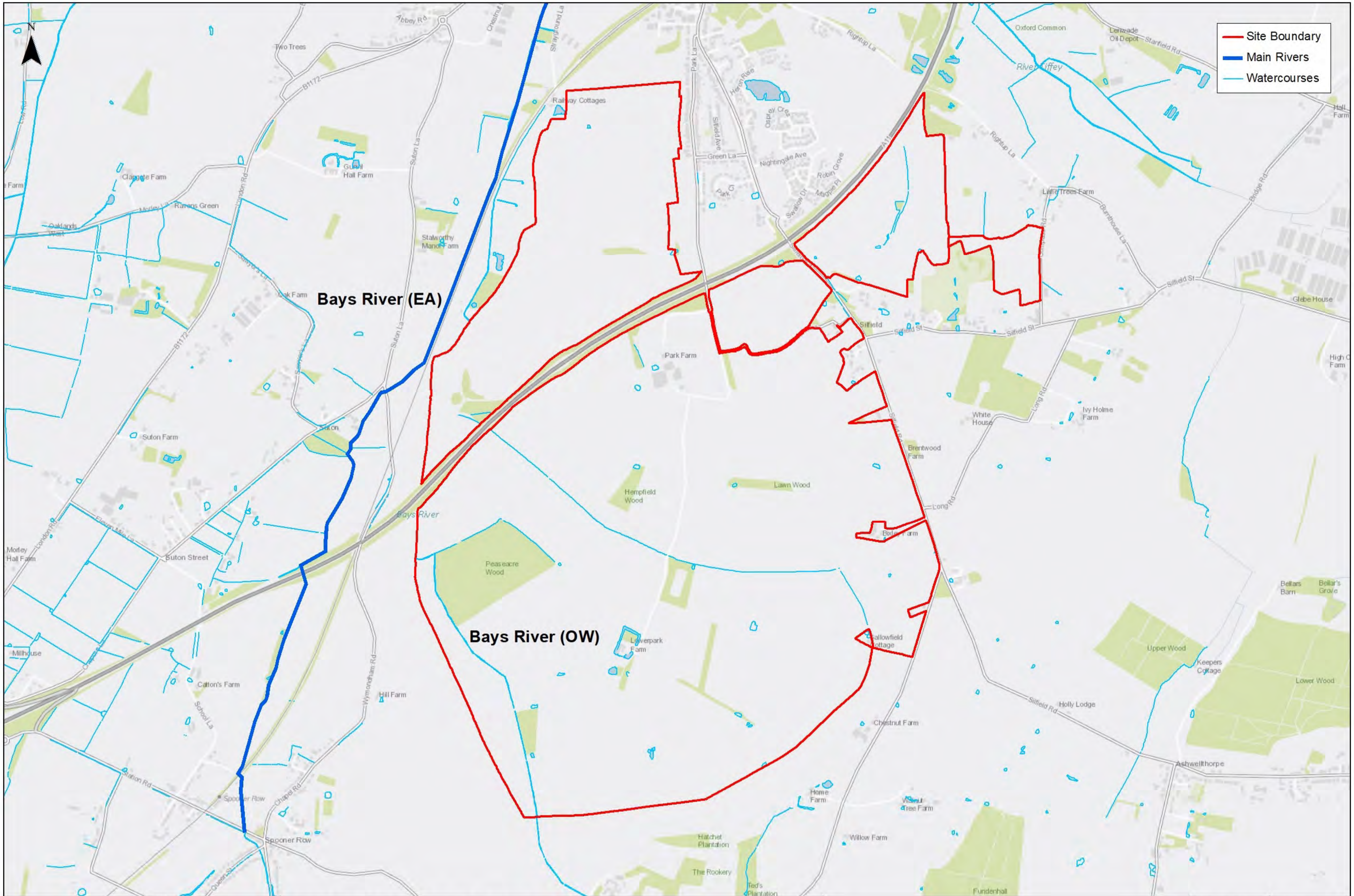

Stantec

Client

Orbit Homes and Bowbridge Strategic Land

47753 SILFIELDS GARDEN VILLAGE

Main River and Watercourses

0 0.7 1.4 km

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Figure 15	Rev A

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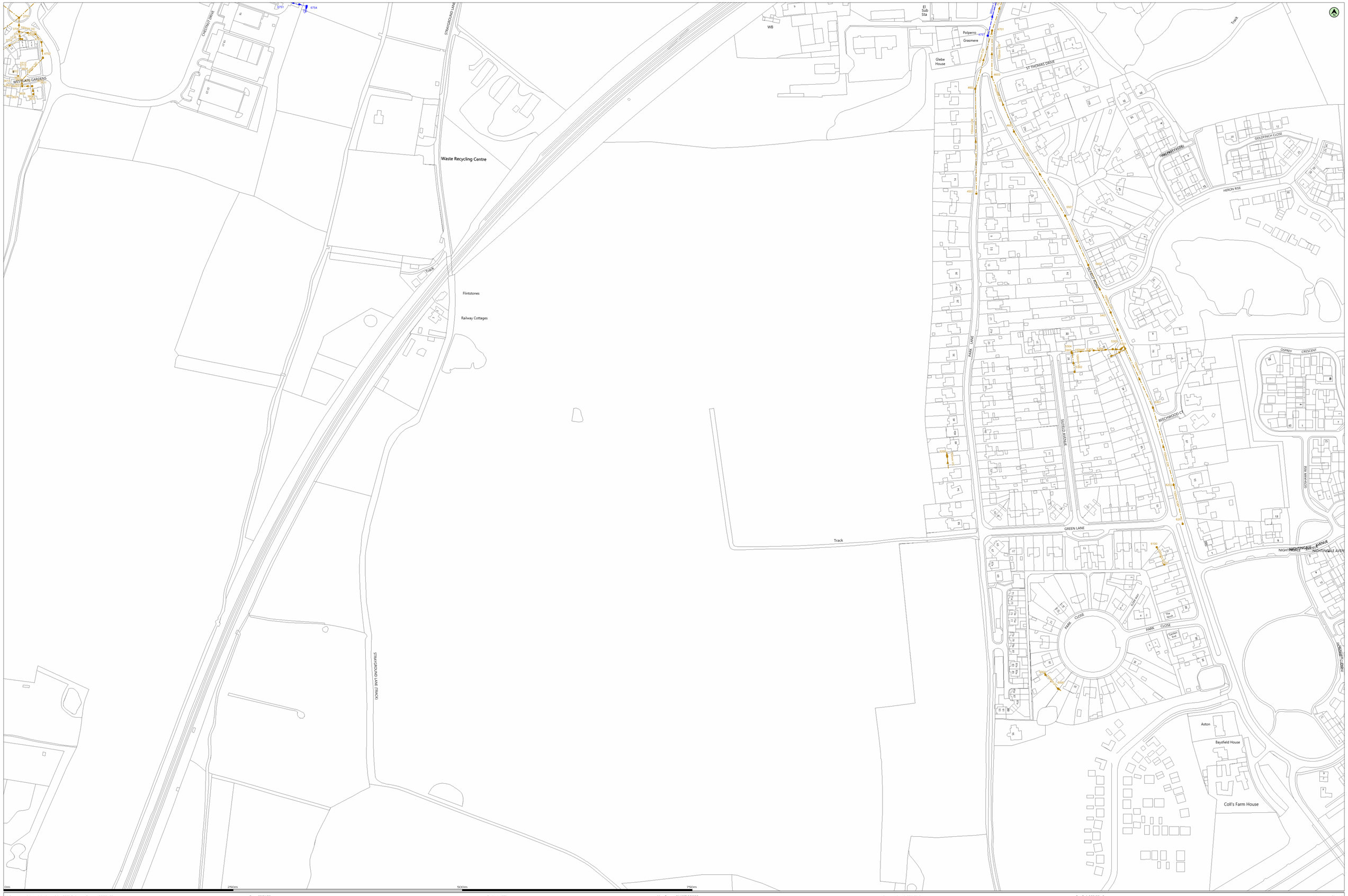
Appendix B – Anglian Water Correspondence



Date: 30/01/20

Scale: 1:1250

Map Centre: 611097,300290

Data updated: 02/12/19

Our Ref: 366126 - 2

Wastewater Plan A0

Foul Sewer		Outfall*		Sewage Treatment Works	
Surface Sewer					
Combined Sewer					
Final Effluent		Inlet*		Public Pumping Station	
Rising Main*					
Private Sewer*		Manhole*		Decommissioned Pumping Station	
Decommissioned Sewer*					

*(Colour denotes effluent type)

freek.vanarkel@stantec.com

1

love every drop
anglianwater

Pre-Planning Assessment Report

83 SILFIELD RD **146950/904297835/1/0077317**

Report published 17/02/2020

Section 1: Proposed development

Thank you for submitting a pre-planning enquiry. This has been produced for Stantec UK. Your reference number is **146950/904297835/1/0077317**. If you have any questions upon receipt of this report, please contact the Pre-Development team on 03456 066087 or email planningliaison@anglianwater.co.uk.

The response within this report has been based on the following information which was submitted as part of your application:

List of planned developments	
Type of development	**No. Of units**
Dwellings	7500

The anticipated residential build rate is:

Year	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12
Build rate	50	50	50	50	50	50	50	50	50	50	50	6950

Site grid reference no.

TM1134099074

Development type

Greenfield

Planning application status

Unknown

The comments contained within this report relate to the public water mains and sewers indicated on our records. Your attention is drawn to the disclaimer in the useful information section of this report.

Section 2: Assets affected

Our records indicate that we have the following types of assets within or overlapping the boundary of your development site as listed in the table below.

Additionally, it is highly recommended that you carry out a thorough investigation of your proposed working area to establish whether any unmapped public or private sewers and lateral drains are in existence. We are unable to permit development either over or within the easement strip without our prior consent. The extent of the easement is provided in the table below. Please be aware that the existing water mains/public sewers should be located in highway or open space and not in private gardens. This is to ensure available access for any future maintenance and repair and this should be taken into consideration when planning your site layout.

Water and Used water easement information		
Asset type	Pipe size (mm)	Total easement required (m)
Water mains	247	6.00 m either side of the centre line
Water mains	247	6.00 m either side of the centre line
Water mains	72	4.50 m either side of the centre line
Water mains	77	4.50 m either side of the centre line
Water mains	73	4.50 m either side of the centre line
Water mains	247	6.00 m either side of the centre line
Water mains	77	4.50 m either side of the centre line
Water mains	Unknown	3.00 m either side of the centre line
Water mains	109	4.50 m either side of the centre line
Water mains	Unknown	3.00 m either side of the centre line
Water mains	258	6.00 m either side of the centre line
Water mains	10	4.50 m either side of the centre line
Water mains	258	6.00 m either side of the centre line
Water mains	251	6.00 m either side of the centre line
Water mains	197	6.00 m either side of the centre line
Water mains	258	6.00 m either side of the centre line
Water mains	77	4.50 m either side of the centre line
Water mains	258	6.00 m either side of the centre line
Water mains	77	4.50 m either side of the centre line
Water mains	109	4.50 m either side of the centre line
Water mains	258	6.00 m either side of the centre line
Water mains	76	4.50 m either side of the centre line
Water mains	247	6.00 m either side of the centre line
Water mains	258	6.00 m either side of the centre line
Water mains	77	4.50 m either side of the centre line
Water mains	251	6.00 m either side of the centre line
Water mains	251	6.00 m either side of the centre line

Water and Used water easement information		
Water mains	Unknown	3.00 m either side of the centre line
Water mains	258	6.00 m either side of the centre line
Water mains	251	6.00 m either side of the centre line
Water mains	258	6.00 m either side of the centre line
Water mains	247	6.00 m either side of the centre line
Water mains	Unknown	3.00 m either side of the centre line
Water mains	247	6.00 m either side of the centre line
Water mains	109	4.50 m either side of the centre line
Water mains	197	6.00 m either side of the centre line
Water mains	77	4.50 m either side of the centre line
Water mains	247	6.00 m either side of the centre line
Water mains	76	4.50 m either side of the centre line
Water mains	258	6.00 m either side of the centre line
Water mains	0	4.50 m either side of the centre line
Water mains	247	6.00 m either side of the centre line
Water mains	Unknown	3.00 m either side of the centre line
Water mains	102	4.50 m either side of the centre line
Water mains	73	4.50 m either side of the centre line
Water mains	73	4.50 m either side of the centre line
Water mains	207	6.00 m either side of the centre line
Water mains	81	4.50 m either side of the centre line
Water mains	Unknown	3.00 m either side of the centre line
Water mains	207	6.00 m either side of the centre line
Water mains	247	6.00 m either side of the centre line
Water mains	251	6.00 m either side of the centre line
Water mains	247	6.00 m either side of the centre line
Water mains	258	6.00 m either side of the centre line
Sewer mains	150	3.00 m either side of the centre line
Sewer mains	150	3.00 m either side of the centre line
Sewer mains	150	3.00 m either side of the centre line

If it is not possible to avoid our assets then these may need to be diverted in accordance with Section 185 of the Water Industry Act (1991). You will need to make a formal application if you would like a diversion to be considered.

Due to the private sewer transfer in October 2011 many newly adopted public used water assets and their history are not indicated on our records. You also need to be aware that your development site may contain private water mains, drains or other assets not shown on our records. These are private assets and not the responsibility of Anglian Water but that of the landowner.

Section 3: Water recycling services

In examining the used water system we assess the ability for your site to connect to the public sewerage network without causing a detriment to the operation of the system. We also assess the receiving water recycling centre and determine whether the water recycling centre can cope with the increased flow and influent quality arising from your development.

Water recycling centre

The foul drainage from this development is in the catchment of Wymondham Water Recycling Centre, which currently does not have capacity to treat the flows from your development site. Anglian Water are obligated to accept the foul flows from your development with the benefit of planning consent and would therefore take the necessary steps to ensure that there is sufficient treatment capacity should the planning authority grant planning permission.

At the time of assessment there is headroom available for additional flow broadly equivalent to 1000 houses

Used water network

There is insufficient capacity within the existing foul water sewerage network serving Wymondham for a development of this size. It is recommended that a foul water drainage strategy for this development considers the option to convey all flows to the Wymondham WRC, which is located on the northwest edge of the town at approx 2.6km from the northern boundary of the development site. As an interim strategy it may be possible to connect initial phases locally. Further analysis will be required in order to evaluate the potential for an interim foul water drainage strategy and enable Anglian Water to provide you with an indicative desktop solution for draining the foul flows from the proposed development. There is no additional charge for this work. Richard Lyon, our Pre-Development Senior Engineer for this area, will be responsible for undertaking this additional work. Richard will contact you shortly to ensure we have sufficient information to evaluate option. For your reference, Richard can be contacted at rlyon@anglianwater.co.uk Please note that Anglian Water will request a suitably worded condition at planning application stage to ensure this strategy is implemented to mitigate the risk of flooding.

It is assumed that the developer will provide the necessary infrastructure to convey flows from the site to the network. Consequently, this report does not include any costs for the conveyance of flows.

Surface water disposal

As you have not requested a connection for surface water flows from the development we assume that your proposed method of surface water management does not relate to Anglian Water operated assets, therefore, we have not assessed the impact of surface water flow. Should the proposed method of surface water management change to include interaction with Anglian Water operated assets, we would wish to be re-consulted to ensure that an effective surface water drainage strategy is prepared and implemented.

As you may be aware, Anglian Water will consider the adoption of SuDs provided that they meet the criteria outline in our SuDs adoption manual. This can be found on our website at http://www.anglianwater.co.uk/developers/suds.aspx. We will adopt features located in public open space that are designed and constructed, in conjunction with the Local Authority and Lead Local Flood Authority (LLFA), to the criteria within our SuDs adoption manual. Specifically, developers must be able to demonstrate:

1. Effective upstream source control,
2. Effective exceedance design, and
3. Effective maintenance schedule demonstrating than the assets can be maintained both now and

in the future with adequate access.

If you wish to look at the adoption of any SuDs then an expression of interest form can be found on our website at: http://www.anglianwater.co.uk/developers/suds.aspx

The proposed method of surface water disposal is not relevant to Anglian Water; we suggest that you contact the relevant Local Authority, Lead Local Flood Authority, the Environment Agency or the Internal Drainage Board, as appropriate.

Trade Effluent

We note that you do not have any trade effluent requirements. Should this be required in the future you will need our written formal consent. This is in accordance with Section 118 of the Water Industry Act (1991).

Used Water Budget Costs

As a result of the recent charging rules published by Ofwat, our charging regime has changed. Your development site will be required to pay a Zonal charge for each new property connecting to the public sewer that benefits from Full planning permission.

Payment of the Zonal charge must be made before premises are connected to the public sewer. More information on the Zonal charge can be found at http://www.anglianwater.co.uk/developers/charges

The Zonal charge consists of two elements. The first is called the 'Fixed Element' which is the same in nature to the Infrastructure charge applied prior to April 2018. The second is called the 'Variable Element' which may vary each financial year.

The elements are combined together to create the 2018/19 Zonal charge for Sewerage:

Fixed Element	£ 370
Variable Element	£ 101

In most circumstances zonal charges are raised on a standard basis of one charge per new connection (one for water and one for sewerage). However, if the new connection is to non-household premises, the fixed element is calculated according to the number and type of water fittings in the premises.This is called the "relevant multiplier" method of calculating the charge. Details of the relevant multiplier for each fitting can be found at our web-page: http://www.anglianwater.co.uk/developers/charges/

The total Zonal charge payable for your site for Sewerage is:

Zonal charge per new connection - Sewerage	No. Of Units	Total amount payable
£ 471	7500	£ 3,532,500.00

It has been assumed that the onsite used water network will be provided under a section 104 Water Industry Act application.

It is recommended that you also budget for connection costs. Please note that we offer alternative types of connections depending on your needs and these costs are available at our website.

Section 4: Useful Information

Used water

Water Industry Act – Key Used Water Sections:

Section 98:

This provides you with the right to requisition a new public sewer. The new public sewer can be constructed by Anglian Water on your behalf. Alternatively, you can construct the sewer yourself under section 30 of the Anglian Water Authority Act 1977.

Section 102:

This provides you with the right to have an existing sewerage asset vested by us. It is your responsibility to bring the infrastructure to an adoptable condition ahead of the asset being vested.

Section 104:

This provides you with the right to have a design technically vetted and an agreement reached that will see us adopt your assets following their satisfactory construction and connection to the public sewer.

Section 106:

This provides you with the right to have your constructed sewer connected to the public sewer.

Section 185:

This provides you with the right to have a public sewerage asset diverted.

Details on how to make a formal application for a new sewer, new connection or diversion are available on our website at http://www.anglianwater.co.uk/developers or via our Development Services team on 03456 066087.

Sustainable drainage systems:

Many existing urban drainage systems can cause problems of flooding, pollution or damage to the environment and are not resilient to climate change in the long term. Therefore our preferred method of surface water disposal is through the use of Sustainable Drainage Systems (SuDS). SuDS are a range of techniques that aim to mimic the way surface water drains in natural systems within urban areas. For more information on SuDS, please visit our website at http://www.anglianwater.co.uk/developers/suds.aspx . We also recommend that you contact the Local Authority and Lead Local Flood Authority (LLFA) for the area to discuss your application.

Private sewer transfers:

Sewers and lateral drains connected to the public sewer on the 1 July 2011 transferred into Water Company ownership on the 1 October 2011. This follows the implementation of the Floods and Water Management Act (FWMA). This included sewers and lateral drains that were subject to an existing Section 104 Adoption Agreement and those that were not. There were exemptions and the main non-transferable assets were as follows:

- Surface water sewers and lateral drains that did not discharge to the public sewer, e.g. those that discharged to a watercourse.
- Foul sewers and lateral drains that discharged to a privately owned sewage treatment/collection facility.
- Pumping stations and rising mains will transfer between 1 October 2011 and 1 October 2016.

The implementation of Section 42 of the FWMA will ensure that future private sewers will not be created. It is anticipated that all new sewer applications will need to have an approved section 104 application ahead of a section 106 connection.

Encroachment:

Anglian Water operates a risk based approach to development encroaching close to our used water infrastructure. We assess the issue of encroachment if you are planning to build within 400 metres of a water recycling centre or, within 15 metres to 100 metres of a pumping station. We have more information available on our website at http://anglianwater.co.uk/developers/encroachment.aspx

Locating our assets:

Maps detailing the location of our water and used water infrastructure including both underground assets and above ground assets such as pumping stations and recycling centres are available from . All requests from members of the public or non-statutory bodies for maps showing the location of our assets will be subject to an appropriate administrative charge. We have more information on our website at: http://www.anglianwater.co.uk/developers/our-assets/

Summary of charges:

A summary of this year's water and used water connection and infrastructure charges can be found at http://www.anglianwater.co.uk/developers/charges

Disclaimer:

The information provided in this report is based on data currently held by Anglian Water Services Limited ('Anglian Water') or provided by a third party. Accordingly, the information in this report is provided with no guarantee of accuracy, timeliness, completeness and is without indemnity or warranty of any kind (express or implied).

This report should not be considered in isolation and does not nullify the need for the enquirer to make additional appropriate searches, inspections and enquiries. Anglian Water supports the plan led approach to sustainable development that is set out in the National Planning Policy Framework ('NPPF') and any infrastructure needs identified in this report must be considered in the context of current, adopted and/or emerging local plans. Where local plans are absent, silent or have expired these needs should be considered against the definition of sustainability holistically as set out in the NPPF.

Whilst the information in this report is based on the presumption that proposed development obtains planning permission, nothing in this report confirms that planning permission will be granted or that Anglian Water will be bound to carry out the works/proposals contained within this report.

No liability whatsoever, including liability for negligence is accepted by Anglian Water, or its partners, employees or agents, for any error or omission, or for the results obtained from the use of this report and/or its content. Furthermore in no event will any of those parties be liable to the applicant or any third party for any decision made or action taken as a result of reliance on this report.

This report is valid for the date printed and the enquirer is advised to resubmit their request for an up to date report should there be a delay in submitting any subsequent application for water supply/sewer connection(s).

Appendix C – Greenfield Runoff Calculations

FEH Greenfield Runoff
Per Hectare

Using 2008 QMED Equation

Project Title	Silfield GV
Project No	47753

Methodology as set out in SuDS Manual 24.3.2 — SUDS Manual Chapter 24

1 Retrieve FEH Catchment Information

Export catchment data from FEH CDROM as .csv file and save in FEH data export

Catchment Descriptors	**BFIHOST**	0.663	*see note 1*
	SAAR	630.0	*see note 1*
	FARL	1.0	*see note 2*

2 Derive QBAR (mean annual flood)

Define area	**Site Area**	1.0	ha	
	Applied Area	50.0	ha	*see note 3*
FEH Index Flood (SuDS Manual Equation 24.2)	**QMED (Q_2)**	1.2	l/s	*see note 4*
Calculate QBAR by dividing QMED by 2yr growth factor	**QBAR**	1.4	l/s	*see note 5*

3 Select appropriate growth factors

FSR Hydrological Region		5
100yr Growth Curve Factor	GQ_{100}	3.56
30yr Growth Curve Factor	GQ_{30}	2.55
10yr Growth Curve Factor	GQ_{10}	1.65
2yr Growth Curve Factor	GQ_2	0.89
1yr Growth Curve Factor	GQ_1	0.87

(refer to FSR Hydrological Region tab)

4 Derive Flood Frequency

Greenfield Runoff per 1ha

100yr Peak Runoff Rate	Q_{100}	4.9	l/s	Q_{100}	4.9	l/s/ha
30yr Peak Runoff Rate	Q_{30}	3.5	l/s	Q_{30}	3.5	l/s/ha
10yr Growth Curve Factor	Q_{10}	2.3	l/s	Q_{10}	2.3	l/s/ha
QBAR Peak Runoff Rate	**QBAR**	1.4	l/s	Q_{BAR}	1.4	l/s/ha
2yr Peak Runoff Rate	Q_2	1.2	l/s	Q_2	1.2	l/s/ha
1yr Peak Runoff Rate	Q_1	1.2	l/s	Q_1	1.2	l/s/ha

Location of FEH Data (as Hyperlink)

DOCUMENT ISSUE RECORD

Rev	Comments	Prepared	Date	Checked	Date
		MH	21.11.19	CW	

Sheet created by Alex Bearne

Last updated 03.01.18 Recommended Review 01.07.18

Notes This spreadsheet has been created to allow derivation of greenfield runoff rates using the FEH statistical method applied in a manner consistent with the recommendations of the SuDS Manual. If you have recommendations to improve this spreadsheet please contact the owner.

Note 1 FEH Web version 3 allows extraction of BFIHOST and SAAR values for each square kilometre grid If you do not think the BFIHOST value is representative of your site then it is possible to derive it manually. This should only very occasionally be necessary. BFI can be derived manually using the the methodology set out in the Flood Estimation Handbook (see *Manual Derivation of BFIHOST tab).*

Note 2 FARL value is a measure of attenuation from reservoirs and lakes for the majority of studies this should be set to 1 (representing no attenuation). If your site includes a large water body with an attenuating affect on runoff please consult a hydrologist.
FARL is a measurement of studies water bodies in the catchment so that their attenuation effects so this term becomes 1.0 and therefore drops out. (see page 23 of the Preliminary rainfall runoff management for developments EA/Defra 2013)
Rainfall runoff management for developments.pdf

Note 3 If the site area is less than 50 hectare the spreadsheet will calculate QMED for 50ha and scale the results automatically to the defined Site Area

Note 4 QMED is calculated using the statistical equation as revised by Kjeldsen in 2008

$$Q_{MED} = 8.3062AREA^{0.8510} .0.1536^{(1000/SAAR)} .FARL^{3.4451} .0.0460^{BFIHOST\wedge 2}$$

Rainfall runoff management for developments.pdf
It is reproduced as Equation 24.2 in the SUDS Manual (pg 512)

Note 5 QBAR is calculated by dividing QMED by the growth factor for the 2 year event, as per the methodology set out in paragraph 6.2.2 of 'Rainfall runoff management for developments' . QBAR is then used as the index flood for the basis of applying the growth factors.

Checked by Natasha Vaughan, Clare Waller, David Collis

FEH Greenfield Runoff
Per Hectare

Using 2008 QMED Equation

Project Title	Silfield GV
Project No	47753

Methodology as set out in SuDS Manual 24.3.2 — SUDS Manual Chapter 24

1 Retrieve FEH Catchment Information

Export catchment data from FEH CDROM as .csv file and save in FEH data export

Catchment Descriptors	**BFIHOST**	0.600	*see note 1*
	SAAR	627.0	*see note 1*
	FARL	1.0	*see note 2*

2 Derive QBAR (mean annual flood)

Define area	**Site Area**	1.0	ha	
	Applied Area	50.0	ha	*see note 3*
FEH Index Flood (SuDS Manual Equation 24.2)	**QMED (Q_2)**	1.5	l/s	*see note 4*
Calculate QBAR by dividing QMED by 2yr growth factor	**QBAR**	1.7	l/s	*see note 5*

3 Select appropriate growth factors

FSR Hydrological Region		5
100yr Growth Curve Factor	GQ_{100}	3.56
30yr Growth Curve Factor	GQ_{30}	2.55
10yr Growth Curve Factor	GQ_{10}	1.65
2yr Growth Curve Factor	GQ_2	0.89
1yr Growth Curve Factor	GQ_1	0.87

(refer to FSR Hydrological Region tab)

4 Derive Flood Frequency

Greenfield Runoff per 1ha

100yr Peak Runoff Rate	Q_{100}	6.1	l/s	Q_{100}	6.1	l/s/ha
30yr Peak Runoff Rate	Q_{30}	4.4	l/s	Q_{30}	4.4	l/s/ha
10yr Growth Curve Factor	Q_{10}	2.8	l/s	Q_{10}	2.8	l/s/ha
QBAR Peak Runoff Rate	**QBAR**	1.7	l/s	Q_{BAR}	1.7	l/s/ha
2yr Peak Runoff Rate	Q_2	1.5	l/s	Q_2	1.5	l/s/ha
1yr Peak Runoff Rate	Q_1	1.5	l/s	Q_1	1.5	l/s/ha

Location of FEH Data (as Hyperlink)

DOCUMENT ISSUE RECORD

Rev	Comments	Prepared	Date	Checked	Date
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Sheet created by Alex Bearne

Last updated 03.01.18 Recommended Review 01.07.18

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Note 2 FARL value is a measure of attenuation from reservoirs and lakes for the majority of studies this should be set to 1 (representing no attenuation). If your site includes a large water body with an attenuating affect on runoff please consult a hydrologist.
FARL is a measurement of studies water bodies in the catchment so that their attenuation effects so this term becomes 1.0 and therefore drops out. (see page 23 of the Preliminary rainfall runoff management for developments EA/Defra 2013)
Rainfall runoff management for developments.pdf

Note 3 If the site area is less than 50 hectare the spreadsheet will calculate QMED for 50ha and scale the results automatically to the defined Site Area

Note 4 QMED is calculated using the statistical equation as revised by Kjeldsen in 2008

$$Q_{MED} = 8.3062AREA^{0.8510} .0.1536^{(1000/SAAR)} .FARL^{3.4451} .0.0460^{BFIHOST\wedge 2}$$

Rainfall runoff management for developments.pdf
It is reproduced as Equation 24.2 in the SUDS Manual (pg 512)

Note 5 QBAR is calculated by dividing QMED by the growth factor for the 2 year event, as per the methodology set out in paragraph 6.2.2 of 'Rainfall runoff management for developments' . QBAR is then used as the index flood for the basis of applying the growth factors.

Checked by Natasha Vaughan, Clare Waller, David Collis

Technical Review of Housing Needs in Greater Norwich (Turley)

Technical Review of Housing Needs in Greater Norwich (Turley)

DAVID LOCK ASSOCIATES

Technical Review of Housing Needs in Greater Norwich

Greater Norwich Local Plan
Representations on behalf of Orbit Homes (2020) Ltd

March 2020

Turley

Contents

Client
Orbit Homes (2020) Ltd

Our reference
ORBP3000

March 2020

Executive Summary

1. The Greater Norwich Local Plan Draft Strategy ('the Draft Plan') – published for consultation until 16 March 2020 – aims to meet a need for 2,027 homes per annum, through a slightly higher housing requirement that makes separate and necessary allowances for supply.

2. The Councils[1] have arrived at such a level of need by simply applying the standard method, introduced for the purposes of establishing a minimum need through recent revisions to the National Planning Policy Framework (NPPF) and related Planning Practice Guidance (PPG).

3. The Councils are therefore understood to view the outcome of this formula as an appropriate representation of the full need for housing in Greater Norwich, despite a concerning lack of evidence to substantiate their position in this regard.

4. This lack of consideration conflicts with national policy and guidance, which emphasises that the standard method produces only a minimum starting point and makes clear that there should be an assessment of whether housing need will actually be higher than that implied by its formula.

5. The technical critique set out in this report strongly indicates that in undertaking such an assessment there is a clear and justified need to depart from the output generated by the standard method, recognising its acknowledged limitation as being based principally on past trends. Following the assembly of up-to-date evidence, including bespoke demographic modelling provided by Edge Analytics, this report concludes that the need for housing in Greater Norwich will exceed that implied by the standard method figure because:

    - The outcome of the method is intrinsically linked to **projections that have underestimated population growth** to date in Greater Norwich, and particularly failed to anticipate a more pronounced – and increasingly vital – net inflow of people from other parts of the UK. This calls into question whether the method is accurately capturing the housing needed by the population in this area, both now and in the future;

    - Meeting the need implied by the method would likely grow the labour force and support in the order of 37,000 new jobs, ostensibly surpassing the target proposed in the Draft Plan (33,000) but **falling short of the job growth that can be reasonably expected to result from an ongoing economic growth strategy**. The Councils' target is considered inadequate in this regard, given that it is derived from an unjustified and unduly simplistic manipulation of a scenario presented in an evidence base document which is now comparatively dated and pre-dates the revised NPPF. Equally, as a result of the datedness of the informing analysis, it is considered to fail to adequately reflect the strong economic context which Greater Norwich has demonstrated for a sustained period of time or the full impact of planned investment. In this context it is

[1] Broadland District Council, Norwich City Council and South Norfolk Council

considered that planning for in the order of 40,000 jobs as a minimum over the plan period would be more reflective of the strong potential for truly enhanced growth in Greater Norwich. This clearly would not be supported where housing provision is restricted to the level implied by the standard method, and the associated ageing of the labour force also appears unlikely to support the desired shift towards higher value sectors;

- Simply meeting the need implied by the method would prompt **a 16% reduction in the annual rate of housing delivery** belatedly achieved over the past three years, when adopted housing targets were met for the first time. Such a reduction is unjustified at a time when the Government remains committed to significantly boosting housing supply; and

- Treating the current outcome of the standard method as a definitive expression of the housing needs of Greater Norwich fails to take account of the Government's **imminent change in the method itself**, scheduled to take place prior to the next stage of consultation and submission of the plan in 2021. No recognition of this has been made in the Councils' position, whereas we suggest a level of flexibility should be built into the housing calculations at this stage of plan-making to reflect this position and enable an effective response to be made to any change in the standard method calculations without undermining the soundness of the Plan.

6. Taking the above into account, the Councils' dismissal of the appropriateness of a higher housing need figure is strongly challenged. In supporting a more reasonable job growth target which better reflects the area's economic strategy and economic potential, it is clear that **a higher level of housing need must be acknowledged and provided for**. This is a position which has been acknowledged in the Councils' earlier consultation, where a more substantive evidence-based assessment was presented and referenced.

7. Furthermore, the Councils' attempt to justify a position whereby their housing requirement provides sufficient flexibility to respond to higher housing need is substantively flawed. The argument put forward by the Councils references the fact that the proposed housing requirement is circa 9% higher than the claimed need, derived from the standard method. However, it is critical to recognise that this buffer is intended to alleviate risks to *supply* and is a separate requirement of national policy. The PPG clearly emphasises that an assessment of the potential for higher need, relative to the standard method, must be undertaken '*prior to, and separate from*' any consideration of supply[2].

8. Based on the above, it is considered that **the Councils must update their evidence base prior to the next stage of consultation on the emerging Local Plan**, to comply with the NPPF and PPG. This should properly evaluate the level of job growth that is likely in Greater Norwich, taking recent successes – no doubt linked to the City Deal and other initiatives – into account while reconsidering the prospects for long-term growth beyond "business as usual" in key locations and sectors. A related assessment

[2] PPG Reference ID: 2a-010-20190220

of housing needs should also be produced, to locally test the minimum need implied by any standard method and ensure that the housing needed to support a growing economy can be robustly and positively planned for.

1. Introduction

1.1 Broadland District Council, Norwich City Council and South Norfolk Council ('the Councils') are currently consulting on the *Greater Norwich Local Plan Draft Strategy* ('Draft Plan'), which has been published for consultation until 16 March 2020.

1.2 This report has been prepared by Turley on behalf of Orbit Homes (2020) Ltd to critically appraise the housing requirement proposed by the Councils, in the context of the requirements of national planning policy.

1.3 The report identifies concerns that the Draft Plan does not provide for an adequate or appropriate level of new housing growth to ensure that it will meet local housing needs in full over the plan period. Specifically, this recognises evidence of high demand for housing in the area which can be reasonably expected to increase where the Councils are successful in realising the positive impacts of their economic growth strategies.

1.4 To ensure a sound plan, it is recommended that that the Councils prepare a robust and up-to-date assessment of housing needs which is compliant with the National Planning Policy Framework (NPPF) and its related Planning Practice Guidance (PPG). This will ensure that the next iteration of the Local Plan provides an adequate supply of deliverable housing land that is capable of meeting needs in full. This must, in accordance with the PPG, take full account of an up-to-date assessment of the likely level of employment growth which will be realised as a result of investment and growth plans.

Report Structure

1.5 The report is structured as follows:

- **Section 2 – Introducing the Proposed Housing Requirement** – a concise overview of the housing requirement proposed in the Draft Plan and its claimed justification;

- **Section 3 – Requirements of National Policy and Guidance** – an overview of the requirements of the NPPF and PPG when calculating local housing needs and establishing appropriate housing requirements, to inform a critique of the Councils' approach;

- **Section 4 – Limitations of the Standard Method for Greater Norwich** – consideration is given to whether the standard method produces a representative level of housing need for Greater Norwich. This specifically considers the reliability of the input demographic baseline and the implications for housing delivery;

- **Section 5 – Supporting an Economic Growth Strategy –** an overview of the economic context in Greater Norwich, considering whether the approach of the Draft Plan could sufficiently grow the labour force and support likely job creation in Greater Norwich; and

- **Section 6 – Conclusions** – a concise summary of the findings and implications of this report.

2. Introducing the Proposed Housing Requirement

2.1 Policy 1 of the Draft Plan ('The Sustainable Growth Strategy') provides for *'around 44,500 new homes'*[3] over the twenty year plan period, from 2018 to 2038. This equates to in the order of 2,225 homes per annum.

2.2 The Draft Plan is clear in confirming that it has been prepared to conform to the 2019 NPPF and its associated guidance, introduced in the following section. In seeking to establish an appropriate housing requirement, it indicates that *'the minimum local housing need figure has been identified using the Government's standard methodology'*[4].

2.3 The Councils' calculation of local housing need using the standard method is captured in Table 6 of the Draft Plan, which is replicated overleaf as Table 2.1. This implies an overall need for 40,541 homes when applying the standard method, or 2,027 homes per annum.

[3] The Greater Norwich Local Plan Draft Strategy (2020), Paragraph 159

[4] The Greater Norwich Local Plan Draft Strategy (2020), Table 6

Table 2.1: Establishing the Draft Plan's Total Housing Figure

	Number of Homes		Explanation
A	Local housing need (2018 to 2038)	40,541	The minimum local housing need figure has been identified using the Government's standard methodology
B	Delivery 2018/19	2,938	The number of homes built 2018/19 (including student accommodation and housing for the elderly)
C	Existing commitment (at April 2019) to be delivered to 2038	33,565	The existing commitment is the undelivered sites which are already allocated and/or permitted, with parts of or whole sites unlikely to be delivered by 2038 excluded
D	New allocations	7,840	These are the homes to be provided on new sites currently proposed to be allocated through the GNLP (6,640) and the South Norfolk Village Clusters Housing Sites Allocation Plan (1,200)
B + C + D	Total housing figure	44,343	Delivery (B), commitments (C) and new allocations (D). This currently provides a 9% buffer to cater for non-delivery of local housing need. The publication version of the plan will aim to provide a minimum 10% buffer (a minimum of a further 250 homes) which is likely to be provided through a combination of additional sites provided through a continuation of additional sites proposed through this consultation and contingency sites identified in this draft plan

Source: Greater Norwich Local Plan Strategy, 2020

2.4 The standard method figure represents the primary input to the Councils' attempt to derive a '*total housing figure*', and is understood to be viewed as an appropriate representation of the full need for housing for which the Draft Plan should identify land to accommodate. The subsequent inputs in the table relate to housing supply aspects and must be considered as separate and distinct from the input housing need figure.

2.5 No up-to-date evidence is provided or referenced within the Draft Plan by the Councils to justify its treatment of the standard method figure. The legitimacy of this approach in the context of national policy and guidance is considered in the next section of this report.

3. Requirements of National Policy and Guidance

National Planning Policy Framework

3.1 National planning policy is a vital mechanism for growing and rebalancing the economy, to ensure that growth supports the Government's plan to '*build a country that works for everyone*'[5].

3.2 The publication of the revised NPPF in July 2018 is clearly of relevance to the emerging review of the Greater Norwich Local Plan, and represents an important change from the policy context that existed when the Joint Core Strategy (JCS) was adopted in March 2011[6]. Further, '*very minor changes*'[7] to the NPPF were made on 19 February 2019[8] with updates made to the PPG on the following day. It is within this context that the critique of the housing requirement has been prepared.

3.3 The NPPF retains at its core the Government's commitment to ensuring that the planning system achieves the parallel objectives of delivering the homes that are needed, supporting the ongoing development of a strong, responsive and competitive economy and making effective use of land to enhance the natural environment[9].

3.4 National policy and guidance provide a clear framework for doing so. The implications for the Draft Plan are summarised below:

- The Draft Plan must include '*strategic policies*'[10] to address the identified priorities for the development and use of land across Greater Norwich. These policies and priorities must address social, economic and environmental objectives in '*mutually supportive ways*', mindful that they are interdependent components of achieving sustainable development[11];

- In respect of social objectives, the strategic policies of the Draft Plan must '*make sufficient provision for: a) housing (including affordable housing)*'[12]. This should be achieved by ensuring that a '*sufficient amount and variety of land*' is made available[13];

[5] Cabinet Office (2017) Building a country that works for everyone: the government's plan

[6] Noting that following a legal challenge the Joint Core Strategy: Broadland part of the Norwich Policy Area Local Plan was subsequently adopted by the Councils on 10 January 2014.

[7] Planning update: Written statement – HLWS1309

[8] MHCLG (February 2019) National Planning Policy Framework

[9] *Ibid*, paragraph 8

[10] *Ibid*, paragraph 17

[11] *Ibid*, paragraph 8

[12] *Ibid*, paragraph 20

[13] *Ibid*, paragraph 59

- The minimum amount of new homes needed across Greater Norwich should be identified using the Government's '*standard method*'[14], the methodology for which is set out in the national PPG; and

- The standard method identifies the *'minimum starting point'* in determining housing needs and there will be circumstances where the *'actual housing need is higher than the standard method indicates'*[15]. The PPG makes clear that this will *'need to be assessed'* before the identified need is translated into a housing requirement figure[16].

3.5 The NPPF confirms that a strategy which either fails to promote sustainable patterns of growth[17] or severely restricts economic growth[18] would form neither a positive, nor justified, nor effective, nor national policy consistent approach.

Calculating local housing need

3.6 As referenced above, paragraph 60 of the NPPF states that strategic policies on housing should be informed by the outcome of the standard method in determining the minimum number of homes needed.

3.7 As the Government has been clear to state, it is important to recognise that the calculation of need through the standard method *'does not represent a mandatory target for local authorities to plan for, but the starting point for the planning process'*[19].

3.8 This clearly does not prohibit authorities from planning for levels of housing provision which exceed this minimum benchmark, or progressing additional evidence to calculate need. Indeed the Government has been clear to articulate its expectation that authorities do just that, having acknowledged that the output of the standard method will not in isolation deliver the 300,000 homes that need to be annually delivered by the mid-2020s to address the current housing crisis. The former Secretary of State for Housing confirmed that:

"The standard method is intended to provide what we believe is a realistic starting point for assessing the number of homes needed for each area. …that is not a target. That is your starting point… It relies on past trends, so does not account for changing circumstances, for example new infrastructure. ***Where growth is expected beyond historic trends authorities are encouraged to establish higher lead figures****…All we are saying is that it is a methodology. It is a starting point for councils to use as part of their need and supply policies*"[20] (emphasis added)

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[14] *Ibid*, paragraph 60

[15] PPG Reference ID 2a-010-20190220

[16] *Ibid*

[17] MHCLG (February 2019) National Planning Policy Framework, paragraphs 20 and 103

[18] *Ibid*, paragraphs 20 and 80

[19] MHCLG (February 2019) Government response to the technical consultation on updates to national planning policy and guidance – a summary of consultation responses and the Government's view on the way forward', p6

[20] Housing, Communities and Local Government Committee oral evidence: MHCLG priorities for the Secretary of State, HC 1036 – Rt Hon James Brokenshire MP, Secretary of State, Ministry of Housing response to Question 32

3.9 The PPG reflects this support for plan-makers in planning for an appropriate level of new housing provision. It is clear to state that the standard method *'does not attempt to predict the impact that future government policies, changing economic circumstances or other factors might have on demographic behaviour'*[21]. As referenced above, therefore, it is clear to identify that there will be circumstances where '*actual housing need is higher than the standard method indicates'.*

3.10 The PPG identifies some of the circumstances that could lead to increased housing need, beyond the past trends that are embedded in the standard method. This is not intended to be exhaustive or viewed as a closed list, but includes situations where:

- Deliverable growth strategies are in place, for example where funding is in place to promote and facilitate additional growth (e.g. Housing Deals);
- Strategic level infrastructure improvements are likely to drive an increase in the homes needed locally; or
- An authority agreeing to take on unmet need from neighbouring authorities, as set out in a statement of common ground.

3.11 Within the same sub-section of the guidance, two further '*situations*' are identified that '*will need to*' be taken '*into account when considering whether it is appropriate to plan for a higher level of need than the standard model suggests*'[22]. These are where either of the following are '*significantly greater*' than the outcome of the standard method:

- Previous levels of housing delivery; and
- A previous assessment of need, such as a recently-produced Strategic Housing Market Assessment (SHMA).

Evaluating the Draft Plan's approach

3.12 As explained in section 2, the Draft Plan does not reference any up-to-date evidence that justifies its treatment of the figure generated as a minimum by the standard method. This is despite acknowledgement that:

"The Government encourages authorities to consider higher levels of growth than that required to meet local housing need, particularly where there is the potential for significant economic growth"[23]

3.13 This is significant where it is recognised that prior to considering housing needs, Policy 1 of the Draft Plan explores economic needs and establishes a target for job growth as part of the economic strategy. This failing is considered further in section 5 of this report.

[21] PPG Reference ID 2a-010-20190220

[22] *Ibid*

[23] The Greater Norwich Local Plan Draft Strategy (2020) paragraph 163

3.14 In apparently seeking to explain the absence of evidence to consider this issue, and specifically the consequence of employment growth on future housing needs, the Councils misconstrue their supply buffer – shown at Table 2.1 of this report – and claim that this provides the flexibility required to accommodate the consequences of successful investment strategies. The Draft Plan states:

"Our overall approach, including to windfalls and contingency, builds in flexibility to support higher than trend economic growth incorporating the Greater Norwich City Deal"[24]

3.15 The NPPF and PPG are clear that it is a requirement of Local Plans that they are deliverable[25] and sufficiently flexible to adapt to rapid change[26]. The plan's soundness will be judged against these requirements. The buffer is required to ensure an appropriate allowance for unforeseen circumstances or non-delivery of sites which might otherwise pass the '*developable*' test. Whilst the Councils have recognised this general point, and the resultant need for an increased level of flexibility, this should not be seen to provide capacity to accommodate need pressures; it is intended to alleviate risks to *supply*. In this context, the PPG is explicit in recognising that when authorities consider the appropriateness of a higher housing need figure,

"this will need to be assessed prior to, and separate from, considering how much of the overall need can be accommodated (and then translated into a housing requirement figure for the strategic policies in the plan)"[27]

3.16 Outside of judging the national policy compliance of the Councils' approach to identifying its local housing need, it is essential that this position is corrected. Ambiguity between the assessment of need and the housing requirement must be avoided.

3.17 The Councils do appear to give some consideration to past housing delivery as part of their justification for dismissing the appropriateness of a higher housing need figure, stating with reference to a higher housing figure being considered under a section titled '*alternative approaches*' that:

"This is not the preferred alternative as evidence of delivery rates over the medium and longer term suggests that higher targets are unlikely to be achievable or deliverable. Setting a higher target that can be achieved undermines the plan-led system"*[28] [*it is assumed this should read can't]

3.18 Evidently this does not comply with the intention of the PPG to use the historic rate of delivery as evidence of a potentially higher demand, thus acting as a 'check' with regards the appropriateness of the standard method output. Instead the Councils have sought to use this indicator to dismiss any higher figure. This is not considered to

[24] *Ibid*

[25] National Planning Policy Framework, 2019, paragraphs 16 and 35

[26] *Ibid,* paragraph 11

[27] PPG Reference ID: 2a-010-20190220

[28] The Greater Norwich Local Plan Draft Strategy (2020) page 54

represent an appropriate or PPG-compliant justification for not attempting to explore the appropriateness of a higher housing need figure.

3.19 It is of note that the standard method attempts to retain realism on delivery through its capping of adjustments to the baseline, at 40%. The PPG specifically acknowledges that:

"The standard method may identify a minimum local housing need figure that is significantly higher than the number of homes currently being planned for. The cap is applied to help ensure that the minimum local housing need figure calculated using the standard method is as deliverable as possible"[29]

3.20 It is of note that the adjustments for Greater Norwich are notably smaller than 40% and that, as is considered in section 4 of this paper, recent rates of delivery have exceeded the current plan target – and indeed the outcome of the standard method – thereby actually suggesting a higher demand has existed. On this basis, it is again not considered that this provides a legitimate line of justification for dismissing the appropriateness of a higher figure.

Summary

3.21 Recent revisions to the NPPF and PPG have evidently established a new context for assessing housing needs to inform sound planning policies, relative to that which informed the previously adopted Joint Core Strategy.

3.22 The NPPF is clear in its requirement for Councils to use the standard method figure as a minimum starting point. Where circumstances are identified which will have implications on demographic behaviour, or where there is expected to be a higher level of need, the PPG is clear in confirming that Councils will need to assess this.

3.23 The PPG identifies a number of circumstances which it suggests would result in an increase in housing need beyond past trends. This includes the pursuit of a deliverable growth strategy, and the agreement to contribute towards meeting unmet needs arising from neighbouring authorities. It also requires Councils to evaluate whether past rates of housing delivery or previous assessments imply a '*significantly greater*' need than suggested by the standard method.

3.24 Whilst the Draft Plan concedes that these factors should be considered, and goes as far as presenting a brief explanation for dismissing the appropriateness of a higher housing need figure, the justification presented is not compliant with PPG. Specifically the Councils have not presented any evidence which explores in full the circumstances that must be considered to comply with the PPG, despite their applicability to Greater Norwich. This is considered to represent a significant failing of the Draft Plan.

3.25 As demonstrated in the remainder of this critique, the circumstances of Greater Norwich clearly place a responsibility upon the Councils to properly consider whether there is a higher need for housing to be met through the Local Plan, in accordance with the PPG. This will ultimately be critical to its soundness.

[29] Paragraph Reference ID: 2a-007-20190220

4. Limitations of the Standard Method for Greater Norwich

4.1 While the housing requirement proposed within the Draft Plan originates from the standard method, the Councils have not adequately addressed the numerous limitations of the method in the circumstances of Greater Norwich. Such considerations are explored in this and the following chapter – which focuses in more detail on the alignment with the economic growth strategy – and clearly undermine the Councils' apparent view that the method appropriately or accurately reflects the actual housing needs of this area.

A moving position

4.2 The Draft Plan appears to take a relatively firm stance on the housing needs of Greater Norwich, without acknowledging the likelihood of change prior to its submission for Examination in June 2021.

4.3 While the Councils' position originates from the standard method, it is important to acknowledge that the current version of the method is viewed only as a '*short-term*' solution[30]. It is widely acknowledged to have limitations in its current form, not least because it falls short of fully aligning with the Government's aspirations for the housing market which includes a commitment to deliver 300,000 homes each year. The method has also been directly criticised by the National Audit Office, who observed that authorities receiving lower numbers than previously assessed may be hampered in their '*plans to regenerate and stimulate economic growth*'[31].

4.4 Within this context, the Government has recently committed to *'reviewing the formula for calculating local housing need'* and introducing *'a new approach which…makes sure the country is planning for the delivery of 300,000 new homes a year'*[32]. i[33]. While precise timescales have not been communicated, the Government has expressed the urgency of its reforms and it is reasonable to anticipate that a new method will l be in place before the Councils' next round of consultation, which is currently scheduled for January 2021. As such, it would be premature to view the current outcome of the standard method as a definitive expression of the housing needs of Greater Norwich. The Councils must allow sufficient flexibility to respond to potential changes on this basis, not least because the method appears likely to underestimate the needs of this area as explored further below.

An inaccurate demographic baseline

4.5 The precise outcome of the standard method is highly sensitive to its input demographic baseline, currently drawn from the 2014-based household projections. These projections show '*the number of households there would be in England if a set of*

[30] MHCLG (2019) Technical consultation on updates to national planning policy and guidance, paragraph 19

[31] National Audit Office (2019) Planning for new homes, paragraph 1.22

[32] MHCLG (2020) Planning for the Future, paragraph 10 (3)

[33]; Rt Hon Robert Jenrick MP during MHCLG Select Committee evidence session, 28 October 2019

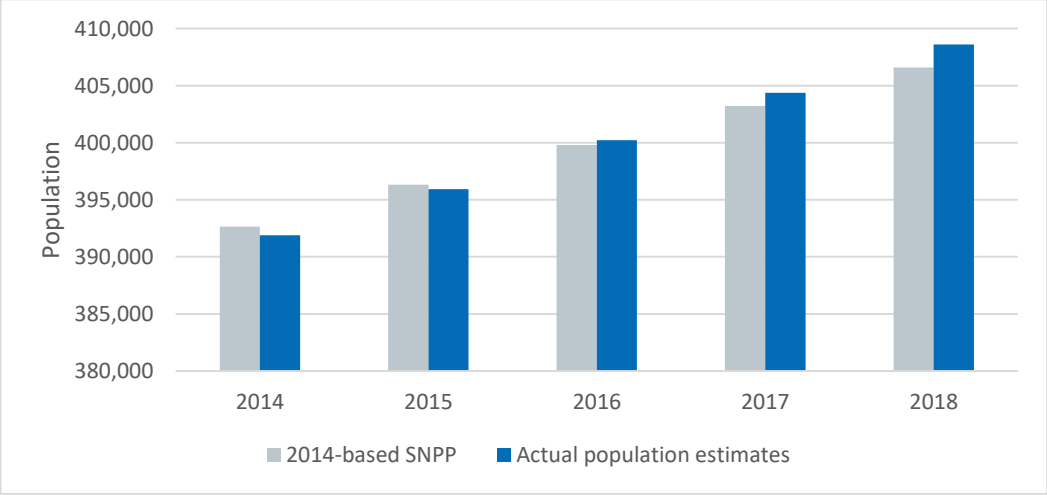
assumptions based on previous demographic trends in population – births, deaths and migration – and household formation were to be realised in practice'[34].

4.6 As such, the precise figure generated through the method is intrinsically linked to the 2014-based sub-national population projections (SNPP) which estimate how births, deaths and migration might affect the population of areas like Greater Norwich. They take account of official population estimates up to and including 2014, and make assumptions on future changes based on trends recorded in the preceding five year period[35] (2009-14).

4.7 The Office for National Statistics (ONS) continues to estimate the population of every local authority each year, with the latest such estimates relating to mid-2018. This allows comparison with the population growth suggested in the initial four years of the 2014-based SNPP, to test the reliability and suitability of their assumptions at a high level.

4.8 In the case of Greater Norwich, this reveals that the population has actually grown by around 20% more than was expected in this four year period. This results in a population that, as of 2018, is some 2,000 persons larger than it is assumed to be under the standard method. This pronounced growth has more than compensated for the modest downward revision to the population estimate in the base year of 2014, since the 2014-based SNPP were produced.

Figure 4.1: Population of Greater Norwich Relative to Assumptions of Standard Method Baseline (2014-18)



Source: ONS; Turley analysis

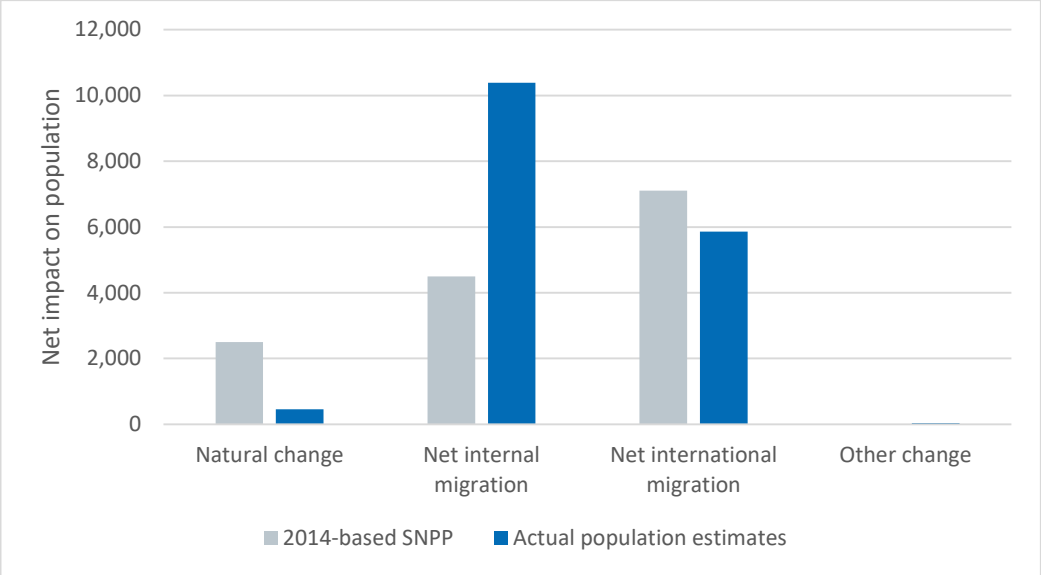
4.9 Further analysis confirms that this discrepancy has been caused by a number of demographic factors, as summarised in the following chart. The net inflow of migrants from elsewhere in the UK ('internal migration') has notably been more than twice the size projected, reflecting either – or both – the positive retention of those assumed to move elsewhere or the more effective attraction of people to Greater Norwich. The

[34] ONS (October 2018) What our household projections really show

[35] ONS (May 2016) Methodology used to produce the 2014-based subnational population projections for England

ONS has notably improved its methods for estimating internal migration within the UK, further validating this recent trend and calling into question the assumptions made – based on older population data, since improved – in the 2014-based SNPP.

Figure 4.2: Projected and Actual Components of Population Change (2014-18)



Source: ONS; Turley analysis

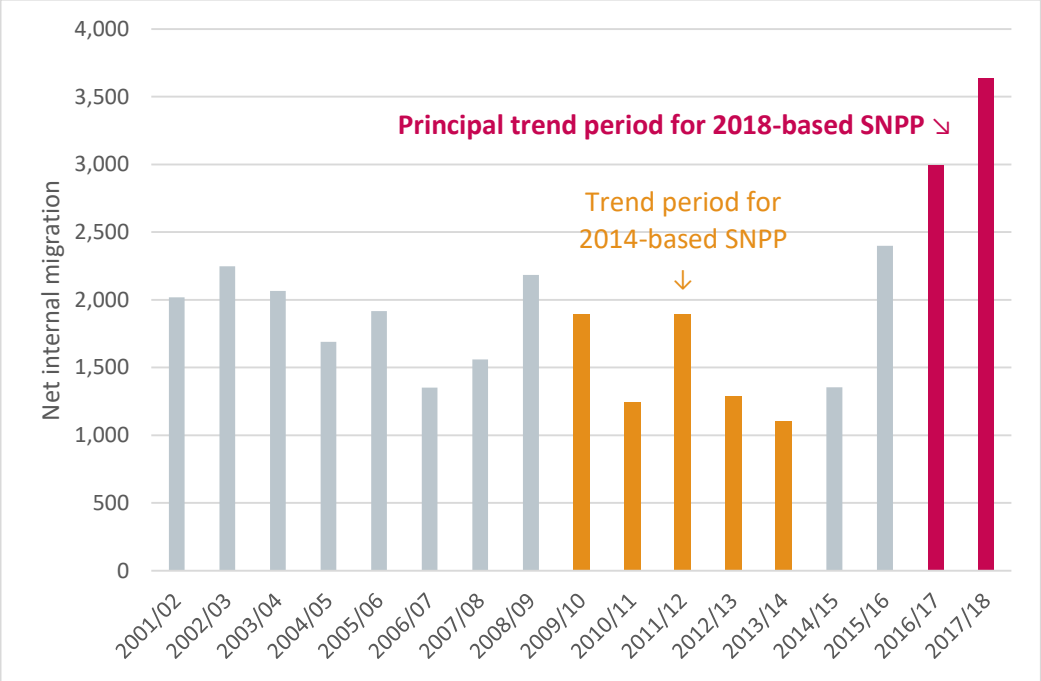
4.10 This net inflow of people from elsewhere in the UK appears to have been invaluable in countering a more severe ageing trend than was anticipated. As shown in the above chart, the 2014-based SNPP expected there to be around 2,500 more births than deaths in Greater Norwich, with such "natural change" thus assumed to grow the population. This has actually been much more finely balanced, with 5% fewer births than anticipated since 2014 and 8% more deaths. Natural change has therefore grown the population of Greater Norwich by only 450 persons since 2014, and net migration has been increasingly critical in averting a stagnation that could ultimately lead to population decline.

4.11 With the 2014-based SNPP underestimating population growth to date, and particularly failing to anticipate a pronounced net inflow of people from other parts of the UK, there is considerable doubt as to whether they provide an appropriate or representative demographic baseline when applying the standard method for Greater Norwich. The baseline appears unlikely to fully capture the housing needed by a population that is already larger than was anticipated, and growing at a more rapid rate.

4.12 This must be explored in further detail prior to the plan's submission, to ensure that the approach to meeting housing need is robustly justified. This process should draw upon recent population estimates and can also take advantage of the imminent release of the 2018-based SNPP in March 2020, which will make revised assumptions on how births, deaths and migration might affect the population of Greater Norwich in future. Any such assumptions will inevitably require interrogation, on the basis that past trends will not always continue into the future, but it is nonetheless of note that

migration will be principally assumed by the ONS to align with trends in the past two years[36] – a period where methodological improvements have revealed a growing net inflow of people into Greater Norwich, as shown below.

Figure 4.3: Net Internal Migration in Trend Periods of 2014-based and 2018-based SNPP



Source: ONS; Turley analysis

Regression from recent delivery

4.13 As noted in section 3, the PPG requires past delivery and previous assessments of need to be taken into account to establish whether there is a '*significantly greater*' need than implied by the standard method. In the case of Greater Norwich, a review of the latest published assessment reveals no such disparity[37] but consideration of past delivery arguably does.

4.14 The Draft Plan clearly relays the Government's aim of significantly boosting housing supply[38]. It is this ambition, and a clear appreciation of the scale of the national housing crisis, that has led to the recent '*radical*' reforms which culminated in the publication of the revised NPPF and introduction of the standard method. These reforms principally sought to ensure that local authorities could not '*duck potentially*

[36] ONS (November 2019) Bulletin on 2018-based Subnational Population Projections

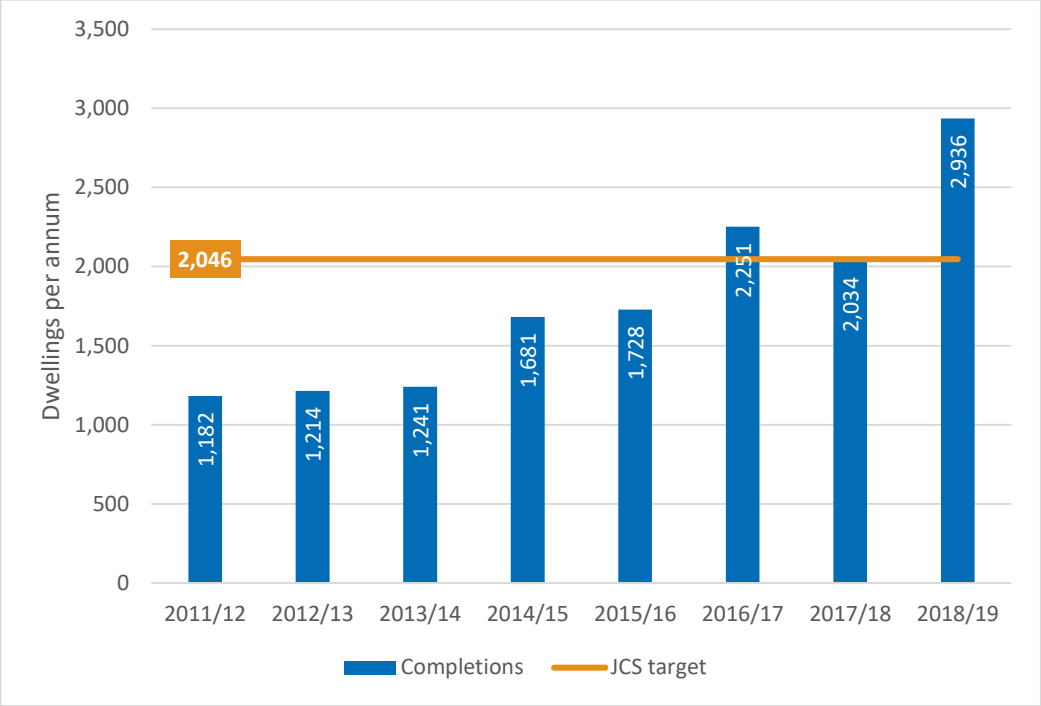
[37] ORS (2017) Central Norfolk Strategic Housing Market Assessment, Figure 80. A need for circa 1,880 dwellings per annum was implied for the Greater Norwich authorities under the "policy-off" scenario which excluded the City Deal. This is around 7% lower than the current outcome of the standard method

[38] The Greater Norwich Local Plan Draft Strategy (2020), paragraph 237

difficult decisions'[39]. There appears to have been no intention to allow authorities to scale back their contribution towards boosting housing supply.

4.15 The situation in Greater Norwich, and its standard method figure of 2,027 dwellings per annum, should be viewed in this context. The Draft Plan confirms, as summarised below, that the rate of development has followed an upward trend in recent years, peaking in the latest monitoring year when 2,936 homes were completed – some 45% above the need now implied by the standard method. It is only in the last three years when the rate of development has reached or even approached the level planned in the JCS, and the Draft Plan explicitly recognises that delivery has historically fallen significantly short of targets[40].

Figure 4.4: Housing Completions in Greater Norwich (dwellings per annum)



Source: Greater Norwich Local Plan Draft Strategy, p15

4.16 As such, while alignment with the standard method could ostensibly boost the average rate of provision since 2011 (1,783dpa) by a modest 14%, it would actually lead to a regression from the encouraging recent trend that has seen Greater Norwich belatedly deliver the homes that are needed. Circa 2,400 homes have been delivered annually on average during the past three years, and the standard method would reduce this by circa 16% at a time when the Government remains committed to significantly boosting the supply of housing.

4.17 The recent rate of delivery is considered to provide an important reference point for the Councils in determining the level of housing growth needed in Greater Norwich. In

[39] DCLG (2017) Fixing our Broken Housing Market – housing white paper, paragraph 14

[40] The Greater Norwich Local Plan Draft Strategy (2020), Section 1 paragraph 44

accordance with the PPG, it implies that there could be a markedly greater need and demand for housing than that currently implied by the standard method.

Summary

4.18 The housing requirement proposed within the Draft Plan originates from the standard method, which has numerous limitations in the circumstances of Greater Norwich that have not been adequately addressed by the Councils in their consideration of its appropriateness. Beyond its disconnect with economic strategy – explored in the following section of this report – these include:

- A demographic baseline which is intrinsically linked to **projections that have underestimated population growth** to date in Greater Norwich, and particularly failed to anticipate a more pronounced – and increasingly vital – net inflow of people from other parts of the UK. This is a reflection of recent success in attracting and retaining people that may have previously moved elsewhere, which appears unlikely to be fully captured by the current baseline;

- **An implicit regression from the rate of housing delivery** achieved in recent years, at a time when the Government remains committed to significantly boosting housing supply. The Councils have only latterly met their housing targets having delivered an average of 2,400 homes annually in the past three years, but the approach of the Draft Plan threatens to stop this encouraging trend and reduce annual delivery by some 16%; and

- The Government's commitment to **introduce a new approach to its formula for calculating local housing need,** with this anticipated to be in place prior to the next stage of consultation and submission of the plan. This cautions against the current treatment of its outcome as a definitive expression of the housing needs of Greater Norwich to 2038, and requires a level of flexibility to be built into the Plan's housing requirement figures to respond to any change in approach.

5. Supporting an Economic Growth Strategy

5.1 The PPG recognises that the standard method figure is based on past trends, and makes no attempt to predict the impact of changing economic circumstances or future Government policies on demographic behaviour. As such, it recognises that there will be situations where actual housing need will be higher than suggested by the standard method, to reflect a departure from past trends[41].

5.2 The Councils acknowledge the relationship between these housing and economic strands of policy, as noted in section 3. However, the lack of published evidence means that there has been an apparent failure to even consider whether the housing growth proposed in the Draft Plan would meet the needs of a growing economy, or would actually act as a barrier to job creation.

5.3 The consequences of this omission are explored within this section.

The Draft Plan's economic growth strategy

5.4 The Draft Plan acknowledges that it should *'support the growth of a wide ranging and changing economy, ranging from high tech businesses with the capacity for major growth through to smaller rural enterprises'*[42].

5.5 The vision is clear in stating that:

"By promoting the Greater Norwich Local Plan our aims is that it will support growth of a diverse low carbon economy which will compete globally through its world class knowledge-intensive jobs in the Cambridge Norwich Tech Corridor"[43]

5.6 Under the 'Economy' theme it progresses to confirm:

"We will see a focus on our local strengths in knowledge intensive sectors. This will include significant growth in digital creative industries in the city centre and in health, life sciences, agri- and bio-technology at the Norwich Research Park and the Food Enterprise Park at Honingham, along with advanced manufacturing and engineering at Hethel"[44]

5.7 Within the justifying text for Policy 1, the Draft Plan includes a section immediately following the introduction of its proposed housing requirement titled '*The Growth Strategy*'. Within this context, the Draft Plan is consistently clear to stress the ambition of achieving growth in Greater Norwich. Specific reference is made to the fact that the Norfolk Strategic Planning Framework (NSPF) *'states that Greater Norwich City Deal*

[41] PPG Reference ID 2a-010-20190220

[42] The Greater Norwich Local Plan Draft Strategy (2020), paragraph 61

[43] *Ibid*, paragraph 109

[44] *Ibid*, paragraph 113

growth requirements, agreed with Government in 2013, will be met through the GNLP'[45].

5.8 The City Deal established a commitment to generate £100 million of private investment, support 300 new businesses and see the creation of 13,000 additional jobs across Greater Norwich, over and above the existing ambitious target of 27,000 new jobs in the adopted Joint Core Strategy. This implied a target associated with the City Deal of in the order of 40,000 additional jobs over the timeframe of the adopted JCS (2008 – 2026), equating to approximately 2,222 per year.

5.9 It is apparent from the above that the Draft Plan is underpinned by a clear strategy for economic growth which is supported by an ongoing investment commitment from the Government in the form of the agreed City Deal.

An appropriate job target?

5.10 The Draft Plan targets the creation of at least 33,000 jobs over the plan period (2018-38) and confirms that this *'has been established through local trend-based evidence'*[46]. Whilst the Draft Plan attributes this to the East of England Forecast Model (EEFM) it also confirms its origination from evidence included in the Employment, Town Centre and Retail Study produced by consultancy GVA in 2017. This study used the then-latest published iteration of the EEFM to explore scenarios of job growth based on '*business as usual*' and the potential for '*enhanced economic growth*'.

5.11 The latter scenario, which the Draft Plan confirms underpins its job target, identified that between 2014 and 2036 around 44,000 jobs could be created, an average of 2,000 jobs per annum. It built from the EEFM but applied positive adjustments to a number of sectors which were considered to better reflect local and national growth potential.

5.12 The 33,000 job target in the Draft Plan is explained as being based on:

- A netting off of the 15,000 jobs created to 2018 from the 45,000 jobs forecast in the Employment, Town Centre and Retail Study; and
- An extension of the forecast by a further two years to 2038, the extension implied to be based on the latest EEFM outputs.

5.13 Such an approach is considered to have a number of significant limitations, explored further in this section:

- The Employment, Town Centre and Retail Study is now comparatively dated and should be revisited to ensure it is based on up-to-date economic datasets;
- The Councils' approach to manipulate the previously evidenced job forecast fundamentally fails to take into account the approach taken to generate the enhanced growth scenario or its forecast of job growth over the long-term; and

[45] *Ibid*, paragraph 13

[46] *Ibid*, paragraph 149

- At a wider level there have been more marked local and national changes to the economy which have a bearing on the forecasting of future job growth and should be taken into account through an updated evidence base. This will ultimately ensure that the Local Plan takes full account of the current ambitions of the Councils and the Local Enterprise Partnership, as well as national Government.

5.14 It is noted that in seeking to justify the 33,000 job growth target the Councils, through the Draft Plan, advance an argument of dismissing the potential for higher growth targets, as have evidently been set previously. This justification is predicated on questions as to whether '*significantly higher targets*' are '*achievable*' given '*current economic uncertainties*' and the '*enhanced growth*' that is ostensibly already provided for.

5.15 The suggestion that higher levels of growth would not be '*achievable*' does not stand up to scrutiny when recognised that the target of 33,000 jobs represents a markedly lower rate of growth than that which has been seen in recent years, as used in the Councils' derivation of their target. The last three years alone have cumulatively seen nearly half as many jobs created than are assumed to be created over the much longer *twenty* year period covered by the target.

Limitations of the underpinning evidence base and its interpretation by the Councils

5.16 The Employment Land Assessment[47] (ELA) – itself a component of the wider Employment, Town Centre and Retail Study – used the "business as usual" forecasts sourced through the EEFM. This forecast a growth of 34,300 full time equivalent (FTE) jobs over the period from 2014 to 2036, or 1,559 per annum on average.

5.17 The exact date of the forecast is not explicitly stated. However, it is assumed that it predates the latest 2017 iteration of the baseline forecast from the EEFM, published in 2018 by Cambridge Econometrics. This most recent version of the EEFM is itself comparatively dated – given the fast changing nature of economic circumstances at a national and global level – but it is clear that the underpinning data in the study does not take into account more recent economic performance or drivers of change.

5.18 This is important where it is recognised that the Councils' own assessment of the economic context of the Draft Plan recognises that Greater Norwich has, over recent years, certainly been successful at generating new jobs, implying a high degree of success in interventions either as a result of associated funding or through businesses' own confidence in investing. It identifies that over the period from 2015 to 2018 around 15,000 jobs have been delivered and that back to 2011 the economy has grown by 14.5% (29,100 jobs)[48].

5.19 The strong job growth recorded between 2015 and 2018 is particularly important as it is unlikely, given the date of the ELA, that its forecasts recognised this strong growth

[47] Greater Norwich; Employment Land Assessment (December 2017) GVA

[48] The Draft Plan cites this analysis of historic job growth as being based on the Cambridge Econometrics: 'East of England Forecasting Model: 2016 baseline results'

precedent. It is reasonable to assume that this strong growth has in no small part been supported by the success of City Deal interventions to date.

5.20 The ELA evidently moved beyond this baseline forecast to develop its "enhanced growth scenario". This is strongly supported as being necessary in Greater Norwich in the context of its clearly stated economic growth strategy, and the City Deal commitment. The limitations of a "business as usual" scenario are clearly acknowledged in the accompanying technical guide to the latest iteration of the EEFM which – in acknowledging that the EEFM forecast is based only on observed past trends – confirms that:

"Past trends reflect past infrastructure and policy environments. Even where major new investments or policy changes are known and have actually started, they can only affect EEFM forecasts to the extent that they are reflected in the currently available data. If they have not yet impact on the available data, they will not be reflected in the forecasts"[49]

5.21 The importance of undertaking a more detailed understanding of local economic potential than that derived from an "off-the-shelf" baseline forecast also resonates positively with the conclusions of a recent study in Cambridgeshire and Peterborough, which found that despite the '*state-of-the-art techniques*' used in developing one such baseline forecast, its '*projections for employment growth in recent years fell below the actual outturn by a significant margin*'[50]. While the review was not critical of the model itself, it recommended '*further 'sense checks'…to employment projections*' and suggested that this should include, though not necessarily be limited to, a consideration of economic policies and investment targeted at stronger growth in the local and sub-regional economy.

5.22 Whilst the approach of the economic evidence underpinning the Draft Plan is supported in principle, the criticism that its underlying approach and data inputs are now dated is considered to be of further importance where such an approach is advanced. The adjustments applied to reflect the potential of the local economy are by design intended to reflect economic ambition and sector performance. In both cases ensuring that an up-to-date position is informing any such adjustments is therefore of greater importance. It is noted that the enhanced scenario resulted from adjustments to the following sectors of the economy:

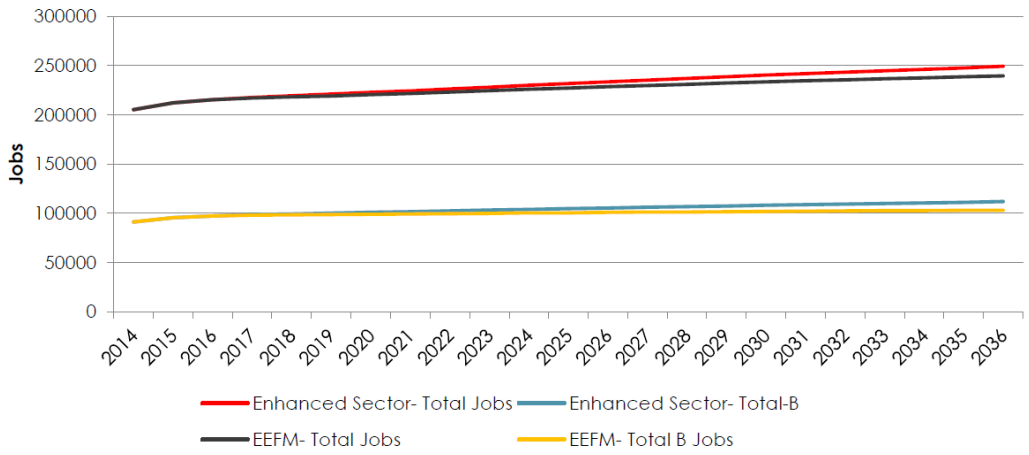
- Professional, Business and Finance Services;
- Advanced Manufacturing and Engineering; and
- Creative and Tech.

5.23 The implications of the adjustments compared to the baseline forecast are shown at Figure 39 of the ELA, which is replicated in Figure 5.1 below.

[49] East of England Forecasting Model Technical Report: Model description and data sources, June 2018, page 7

[50] Cambridgeshire and Peterborough Independent Economic Review (September 2018) p68 and Figure 22

Figure 5.1: Greater Norwich – Forecasted Total Jobs Growth



Source: Greater Norwich Employment Land Assessment (2017) – Figure 39

5.24 In referring specifically to the "total jobs" trajectory above, it is evident that the '*enhanced*' forecast assumed a steady but higher rate of job growth over the baseline or business as usual scenario generated from the EEFM. The additional jobs are therefore projected to increase cumulatively over the projection period and in particular in the next five years or so.

5.25 Where this is recognised, this strongly challenges the Councils' decision to simply remove the stronger job growth delivered over the last three years from the total forecast. This fundamentally fails to recognise the approach taken in the study in its adjustment of specific sectors of growth and fails to recognise, as the methodology in the ELA does, that investment is intended to be catalytic with additional job growth building on historic success.

5.26 The above provides no justification to support the Councils' use of this forecast to generate a new target, which itself implies an annual growth rate of only 1,650 jobs per year. Such a level of job growth must be compared with:

- The recent creation of 5,000 jobs each year on average between 2015 and 2018;
- The baseline forecast in the ELA which assumed job growth of 1,559 FTE jobs per annum. The Draft Plan target represents only a very modest uplift on this annual figure, which is potentially eliminated when converted to a comparable "total jobs" measure rather than FTE; and
- The ELA enhanced scenario, which suggests an average growth of 2,000 jobs per annum but increases over the longer-term where this recognises improved rates of growth in key sectors.

5.27 A consideration of the latest position regarding the Councils' economic strategy and the aspirations of other partners provides further important context in assessing the validity of the job growth target now set out in the Draft Plan. This is explored further below.

A more positive economic strategy context

5.28 The Councils have expressed that '*the outlook for the local economy is extremely positive'*[51]*.* It has also identified that this outlook is reinforced by:

- The opening of the Broadland Northway; and
- Planned improvements to the A47 and train services.

5.29 Importantly, in the context of the circumstances identified in the PPG as being a trigger for the appropriateness of planning for a higher level of growth, the Councils have also confirmed that:

"…economic advisers believe that the economy can continue to grow strongly, particularly in 'high value' sectors. This is reinforced by the LEP's industrial and economic strategies and other plans to attract growth in high tech and knowledge-based industries such as life sciences, biotechnology, agri-tech, food and drink, creative and digital industries, and high-value engineering"[52]

5.30 More specifically, the Draft Plan identifies the context for economic growth provided by the Cambridge Norwich Tech Corridor[53], and the importance of the New Anglia Local Enterprise Partnership's existing Norfolk and Suffolk Economic Strategy (NSES) and the emerging Norfolk and Suffolk Local Industrial Strategy (LIS), which builds on the former.

5.31 Looking first at the Cambridge Norwich Tech Corridor it is of note that this has increasingly been recognised as a major economic growth location for the region. The initiative aims to capitalise on existing R&D capabilities and business opportunities within economic hubs to build technology based clusters along its route. This includes economic opportunities associated with:

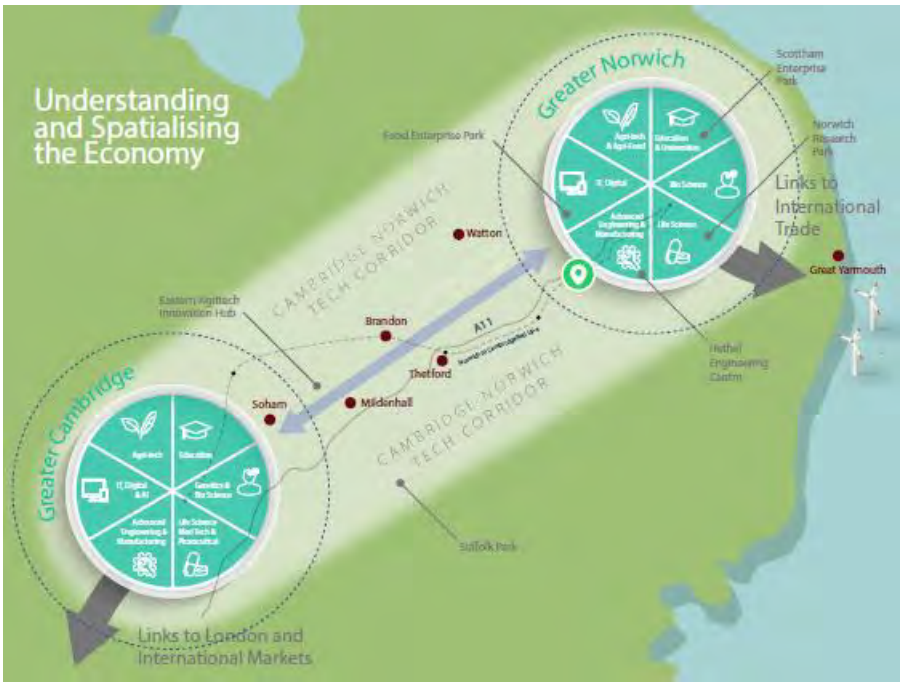
- The area's universities, in particular the University of Cambridge; Anglia Ruskin University and the University of East Anglia (UEA);
- Norwich Research Park, a leading centre for research in food, health and the environment; and
- Hethel Engineering Centre, a leading centre for innovation in high performance engineering and advanced manufacturing.

[51] Councils' Frequently Asked Questions regarding the Draft Plan: https://www.gnlp.org.uk/frequently-asked-questions/

[52] *Ibid*

[53] The Greater Norwich Local Plan Draft Strategy (2020), Section 1 paragraph 5

Figure 5.2: Cambridge-Norwich Tech Corridor



5.32 Overall, the initiative aims to deliver up to 15,000 new jobs in engineering, agri-tech and other LEP target sectors, as well as wider sectors that are of importance to the economy; £900 million private sector investment in construction activity; and 20,000 new homes along the corridor[54].

5.33 The NSES also sets out a series of ambitions that will be delivered focussed on Norfolk and Suffolk, albeit also recognising those areas within the Cambridge – Norwich Corridor as being one of a number of *'priority places'* with significant opportunities for growth. Importantly the NSES builds on the Strategic Economic Plan[55] for New Anglia which targets: the creation of 95,000 more jobs (50% higher than the baseline level of job growth forecast); 10,000 new businesses; 117,000 new homes and increased productivity. Collectively these strategies clearly underpin the rationale for *'enhanced growth'* in Greater Norwich with this expected to deliver beyond 'trend-based' growth over the plan period.

5.34 As referenced above the New Anglia LEP are seeking to update and advance the above strategies through the development of the Local Industrial Strategy[56] for Norfolk and Suffolk. To date a draft of this strategy has been published which contains a clear aim for the area to become a globally-recognised, high-tech and inclusive economy which is leading the transition to a post-carbon economy through sustainable food production and renewable energy generation. The £290m of Local Growth Fund support for delivery of the following is highlighted within the strategy providing:

[54] https://www.south-norfolk.gov.uk/businesses/relocating-your-business-south-norfolk/cambridge-norwich-tech-corridor

[55] New Anglia LEP (2014) Strategic Economic Plan

[56] New Anglia LEP (2019) Norfolk and Suffolk Local Industrial Strategy

- A Digi-Tech Factory at City College Norwich – interconnected Digital Technology, Engineering and Design Courses delivered in a purpose-designed building; and

- An Institute of Productivity at the University of East Anglia – a new regional hub for engineering, technology and management.

5.35 The NPPF confirms that *'planning policies should…set out a clear economic vision and strategy which positively and proactively encourages sustainable growth, having regard to Local Industrial Strategies and other local policies for economic development and regeneration'*[57].

5.36 The above review of the existing strategies for growth, including the emerging LIS, confirms that it is undoubtedly appropriate for the Draft Plan to target an enhanced level of employment growth than implied by trend-based or 'off-the-shelf' forecasts. In the context of an evolving economic strategy context, the reliance on forecasts presented within a study produced in 2017 creates a concerning risk that the latest understanding of this growth potential is not fully captured. The strength of the local economy in creating new jobs would imply that whilst it represents an 'enhanced' outlook of growth it appears unduly modest when compared to this historic success.

5.37 As already identified above, this further demonstrates the need to revisit the evidence base to inform the next iteration of the Draft Plan to ensure that this more positive context is captured.

5.38 Beyond the exact scale of job growth to be provided for, supporting these strategies' realisation of future job growth will evidently require a pool of labour. This is an issue that is clearly recognised at the opposite end of the Tech Corridor in Cambridge. A consequence of its insufficient housing provision, beyond worsening affordability, has been that companies are *'deterred from setting up in the area if they do not believe the houses their workers require will be available'*[58]. There are also risks associated with economic and social dynamism '*if new houses are not built, due to a population which will inevitably age where there is a combination of high property prices and insufficient additions to the housing stock*'.

Implications of job growth for the labour force and housing need

5.39 It is apparent from the above that there are justified concerns as to the appropriateness of the overall scale of job growth targeted through the Draft Plan. Whilst the inclusion of a quantified target is considered to represent a positive approach to plan-making, the evidence above highlights that this target does not align with the wider economic strategy nor represent an up-to-date consideration of the current economic context of Greater Norwich, including planned investment.

5.40 Policy 1 of the Draft Plan is explicit in considering housing needs and economic growth in tandem. The job growth target and the housing requirement sit side by side in the policy text and the Draft Plan states that:

[57] National Planning Policy Framework (2019) paragraph 81(a)

[58] Cambridgeshire and Peterborough Independent Economic Review (September 2018) p70

*"The local plan's **preferred option** is to support growth of around 33,000 new jobs and a minimum of around 40,540 new homes between 2018 and 2038"*[59] *(original emphasis)*

5.41 As noted at the beginning of this section, no evidence is referenced to reassure that the Councils have assessed the extent to which these objectives are mutually supportive, despite the clear recognition of a relationship between these two key strands of the Draft Plan.

5.42 It is recognised that earlier materials published in relation to the Local Plan, including the Growth Options document in 2018, previously drew upon evidence – in the form of the 2017 SHMA – to inform the scale of housing it was suggesting could be required to both meet housing needs and support economic growth objectives. This indicated that there was likely to be a higher need for housing, albeit modestly, than implied by the standard method[60]. Despite this conclusion, such considerations are now entirely omitted from the Draft Plan.

5.43 Demographic modelling has been commissioned to resolve this apparent gap in the Councils' current evidence base and establish the job growth that could be supported where housing provision aligns – as currently proposed – with the minimum need implied by the standard method. This modelling has been configured by Edge Analytics, based on its industry leading POPGROUP software with a series of evidence-based assumptions as outlined at **Appendix 1**.

5.44 The modelling suggests that simply meeting the minimum housing need could grow the labour force to support in the order of 37,700 additional jobs across Greater Norwich over the plan period (2018-38), equating to circa 1,885 jobs each year and only modestly exceeding the stated target for 33,000 additional jobs in the Draft Plan.

5.45 On the basis of the evidence presented earlier in this section, it is considered that a job target which, as a minimum, more closely reflects the rate of growth forecast within the ELA (i.e. 2,000 jobs per annum) is more appropriate in ensuring that the Draft Plan recognises that the aim of investment in the economy is to achieve a catalytic effect over the plan period. This suggests that it would be justified for the Draft Plan to target 40,000 additional jobs as a minimum over its full plan period, albeit we would strongly encourage the Councils to revisit the evidence base to more comprehensively assess the potential for future job growth. This higher target nonetheless serves as a valuable proxy which illustrates the prevailing risk that the standard method will not provide the labour force that is required to fully realise the economic potential of Greater Norwich.

5.46 It is important to note that such a position has precedent within the Councils' evidence base. The 2017 SHMA, referenced earlier, separately considered how the City Deal could influence the need for housing. This evidence-based report concluded in the context of supporting this elevated level of job growth *'that the demographic*

[59] The Greater Norwich Local Plan Draft Strategy (2020), page 53

[60] Greater Norwich Local Plan Regulation 18 Consultation Growth Options, paragraph 4.19

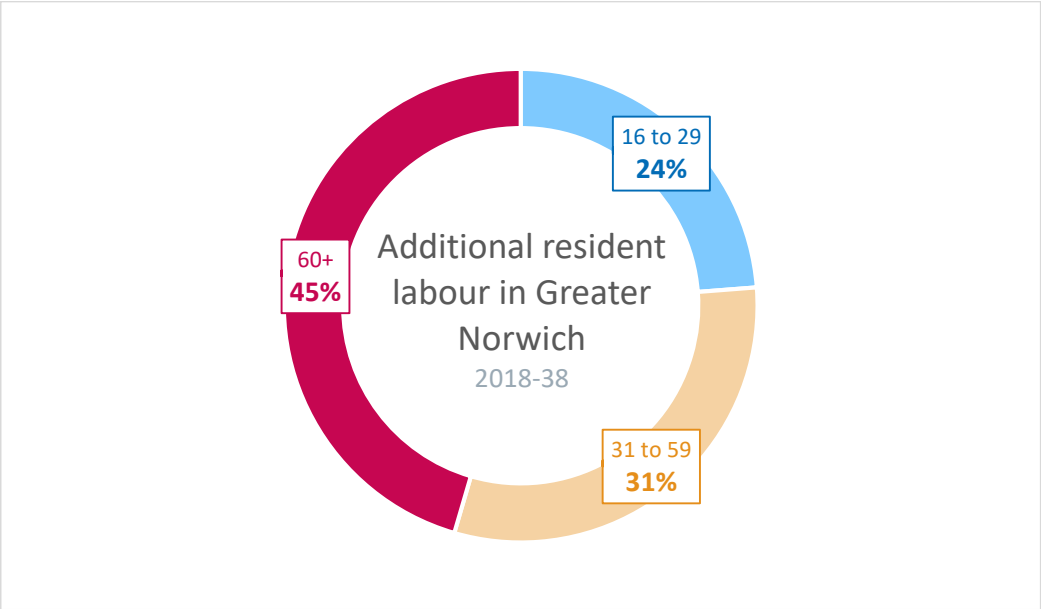
projections would require a significant uplift in dwelling delivery to accommodate the extra workers required for the City Deal forecasts"[61].

5.47 Where it is recognised that the SHMA precedes the revised NPPF and PPG, the up-to-date modelling undertaken to inform this technical critique reinforces the principle previously established in the Councils' evidence. It is considered that this strongly highlights the importance of the Councils revisiting this evidence to prepare an assessment of economic and housing needs in accordance with NPPF/ PPG as summarised in section 3 of this report.

5.48 Beyond a consideration of the overall balance between potential labour-force growth and job growth, it is also of critical importance that new evidence prepared by the Councils gives adequate consideration to the implications of the age profile of the implied labour-force, where provision aligns with the standard method.

5.49 Specifically, the modelling introduced above suggests that residents aged 60 and over will account for nearly half (45%) of the additional labour force capacity over the plan period, which is nearly double the contribution of those aged under 30 (24%).

Figure 5.3: Profile of Additional Resident Labour in Greater Norwich (2018-38)



Source: Edge Analytics; Turley analysis

5.50 While individuals in older age cohorts will undoubtedly remain in the labour force to an extent, the Councils must explain and justify whether their ambitions to deliver a greater proportion of higher value jobs – many of which are in new or emerging sectors – can be supported by this changing profile of labour. It is reasonable to expect that the creation of such jobs will attract greater numbers of graduates and younger professionals, a proportion of which may be retained from the further and higher education providers in Greater Norwich. This in turn would be expected to generate

[61] Central Norfolk Strategic Housing Market Assessment 2017, ORS, paragraph 5.9

further demographic growth which should be reflected in any calculation of housing need, and – given the analysis in section 4 – appears unlikely to be fully captured in the baseline of the current method.

Summary

5.51 The Draft Plan purports to acknowledge the important relationship between the Councils' economic growth strategy and the establishment of an appropriate housing requirement. Indeed, both core strands are combined in Policy 1, the Sustainable Growth Strategy.

5.52 Whilst the Draft Plan is explicit in identifying a growth strategy, underpinned by commitments to investment in the area's economy through the City Deal, no evidence is presented to provide reassurance that housing provision aligned to the standard method will be sufficient to meet its job growth target. This is despite previous published evidence being cited in earlier iterations of the Local Plan and highlighting that a higher need for housing can be expected in such circumstances, relative to that implied by trend-based projections.

5.53 In order to fill this gap, modelling has been procured to inform this technical critique. This suggests that in the order of 37,000 jobs could be supported over the plan period where housing provision aligns with the minimum need implied by the standard method.

5.54 At face value, this exceeds the stated target for 33,000 jobs stated under Policy 1, thereby implying that such a level of housing provision will be sufficient.

5.55 However, the evidence in this section serves to strongly challenge the extent to which the 33,000 job target is robustly evidenced or appropriate, in the context of:

- Its origination from a comparatively dated ELA (2017);
- Evidence of comparatively strong job growth over the last three years, with in the order of 5,000 jobs created each year on average. This is in no small part likely to reflect the success of investment to date through the City Deal and other initiatives;
- A misinterpretation of the approach applied in the ELA in the generation of its enhanced growth scenario, upon which the figure is based. This recognises that the scenario was developed on the basis of long-term stronger growth in key sectors, which assumed a rising trajectory of job growth averaging in the order of 2,000 jobs per annum. The Councils' approach to "netting-off" strong job growth to date fundamentally fails to acknowledge this profile with the assumption instead that the rate of job growth falls closer to the baseline scenario for the remainder of the projection period; and
- The ongoing commitment of the Councils and partners to continue to facilitate stronger job growth supported by commitments to deliver new infrastructure investments as well as the delivery of priority employment locations.

5.56 On the basis of the above, it is considered reasonable that the Draft Plan should as a minimum seek to provide for job growth which reflects the rate in the enhanced growth scenario being sustained. This would imply that a minimum target of circa 40,000 jobs would be more appropriate and representative of its growth strategy. On the basis of the demographic modelling presented in this section, it is evident that there is a real risk that the level of housing growth implied by the standard method will not meet needs in full and that a higher level of housing need is more appropriate.

5.57 Such a position is further compounded where it is recognised that the changing age profile of the labour-force where provision aligns with the standard method is unlikely to facilitate the shift towards higher value jobs, which themselves are assumed to be in new sectors of the economy and which will require evolving skills. This would also point to the likelihood of a greater pressure arising from new graduates and younger professionals looking to work and live in the area.

5.58 In the context of the above it is considered critical that the Councils revisit their evidence base through the preparation of an up-to-date assessment of housing and employment needs to ensure that its growth strategy is compliant with the NPPF and PPG.

5.59 With regard to planning for new homes, it is also important to recognise that a stronger economy at the end of the plan period would be expected to continue to generate a parallel sustained need for housing. This must be reflected in a more positive and robust approach to planning for housing within the Draft Plan to ensure a flexible and deliverable supply of land.

6. Conclusions

6.1 The Greater Norwich Local Plan Draft Strategy – published for consultation until 16 March 2020 – aims to meet a need for 2,027 homes per annum, through a slightly higher housing requirement that makes separate and necessary allowances for supply.

6.2 The Councils have arrived at such a level of need by simply applying the standard method, introduced for the purposes of establishing a minimum need through recent revisions to the National Planning Policy Framework (NPPF) and related Planning Practice Guidance (PPG).

6.3 The Councils are therefore understood to view the outcome of this formula as an appropriate representation of the full need for housing in Greater Norwich, despite a concerning lack of evidence to substantiate their position in this regard. This lack of consideration conflicts with national policy and guidance, which emphasises that the standard method produces only a minimum starting point and makes clear that there should be an assessment of whether housing need will actually be higher than implied by its formula.

6.4 The technical critique set out in this report strongly indicates that in undertaking such an assessment there is a clear and justified need to depart from the output generated by the standard method, recognising its acknowledged limitation as being based principally on past trends. Following the assembly of up-to-date evidence, including bespoke demographic modelling provided by Edge Analytics, this report concludes that the need for housing in Greater Norwich will exceed that implied by the standard method figure because:

- The outcome of the method is intrinsically linked to **projections that have underestimated population growth** to date in Greater Norwich, and particularly failed to anticipate a more pronounced – and increasingly vital – net inflow of people from other parts of the UK. This calls into question whether the method is accurately capturing the housing needed by the population in this area, both now and in the future;

- Meeting the need implied by the method would likely grow the labour force and support in the order of 37,000 new jobs, ostensibly surpassing the target proposed in the Draft Plan (33,000) but **falling short of the job growth that can be reasonably expected to result from an ongoing economic growth strategy**. The Councils' target is considered inadequate in this regard, given that it is derived from an unjustified and unduly simplistic manipulation of a scenario presented in an evidence base document which is now comparatively dated and pre-dates the revised NPPF. Equally, as a result of the datedness of the informing analysis, it is considered to fail to adequately reflect the strong economic context which Greater Norwich has demonstrated for a sustained period of time or the full impact of planned investment. In this context it is considered that planning for in the order of 40,000 jobs as a minimum over the plan period would be more reflective of the strong potential for truly enhanced growth in Greater Norwich. This clearly would not be supported where housing

provision is restricted to the level implied by the standard method, and the associated ageing of the labour force also appears unlikely to support the desired shift towards higher value sectors.

- Simply meeting the need implied by the method would prompt **a 16% reduction in the annual rate of housing delivery** belatedly achieved over the past three years, when adopted housing targets were met for the first time. Such a reduction is unjustified at a time when the Government remains committed to significantly boosting housing supply; and

- Treating the current outcome of the standard method as a definitive expression of the housing needs of Greater Norwich fails to take account of the Government's **imminent change in the method itself**, scheduled to occur prior to the next stage of consultation and submission of the plan in 2021. No recognition of this has been made in the Councils' position, whereas we suggest a level of flexibility should be built into the housing calculations at this stage of plan-making to reflect this position and enable an effective response to be made to any change in the standard method calculations without undermining the soundness of the Plan.

6.5 Taking the above into account, the Councils' dismissal of the appropriateness of a higher housing need figure is strongly challenged. In supporting a more reasonable job growth target which better reflects the area's economic strategy and economic potential, it is clear that **a higher level of housing need must be acknowledged and provided for**. This is a position which has been acknowledged in the Councils' earlier consultation, where a more substantive evidence-based assessment was presented and referenced.

6.6 Furthermore, the Councils' attempt to justify a position whereby their housing requirement provides sufficient flexibility to respond to higher housing need is substantively flawed. The argument advanced references the fact that the proposed housing requirement is circa 9% higher than the claimed need, derived from the standard method, but it is critical to recognise that this buffer is intended to alleviate risks to *supply* and is a separate requirement of national policy. The PPG clearly emphasises that an assessment of the potential for higher need, relative to the standard method, must be undertaken '*prior to, and separate from*' any consideration of supply[62].

6.7 Based on the above, it is considered that **the Councils must update their evidence base prior to the next stage of consultation on the emerging Local Plan**, to comply with the NPPF and PPG. This should properly evaluate the level of job growth that is likely in Greater Norwich, taking recent successes – no doubt linked to the City Deal and other initiatives – into account while reconsidering the prospects for long-term growth beyond "business as usual" in key locations and sectors. A related assessment of housing needs should also be produced, to locally test the minimum need implied by any standard method and ensure that the housing needed to support a growing economy can be robustly and positively planned for.

[62] PPG Reference ID: 2a-010-20190220

Appendix 1: Modelling Assumptions

This report has drawn upon a demographic cohort component model configured by Edge Analytics using the industry-standard POPGROUP suite of software. A scenario has been principally developed to explore the population and job growth that could be expected in Greater Norwich where 2,027 dwellings per annum are assumed to be provided between 2018 and 2028, reflecting the underpinning need used within the housing requirement proposed in the Draft Plan.

In developing these scenarios, the following assumptions have been made:

- Housing growth has been indicatively distributed between the three Greater Norwich authorities based on the current split of the standard method figure[63], albeit only the aggregated figures for Greater Norwich as a whole are referenced in this report.

- The population at the start of the plan period (2018) is based on the official mid-year estimate produced by the ONS, with earlier population estimates also integrated within the model.

- Age-specific fertility and mortality assumptions are derived from the 2016-based sub-national population projections (SNPP). These represent the latest such assumptions to have been published by the ONS, and are based on recent population trends in Greater Norwich.

- From 2018 onwards, population changes to the extent that it can be accommodated through the specified level of housing provision. Net internal migration can therefore increase or reduce each year depending upon the availability of housing, while taking account of other changes to the population. The model thus makes its own assumptions on internal migration flows into and out of Greater Norwich.

- While the model makes its own assumptions on the number of internal migrants, the *profile* of internal and international migrants aligns with that suggested by the 2016-based SNPP. The assumed count of future international migrants to and from Greater Norwich is also taken from this projection.

- Economic activity rates recorded in Greater Norwich at the 2011 Census, by age and sex, have initially been applied, but the rates for those aged 16 to 89 have been adjusted to reflect the latest national forecasts produced by the Office for Budget Responsibility[64] (OBR) in July 2018.

- There is assumed to be no change in the commuting ratio recorded in each authority at the 2011 Census.

- Unemployment rates are assumed to remain fixed at the level recorded in each authority in 2018, as this is lower than the pre-recession average in Norwich and South Norfolk and only marginally higher than this average in Broadland. This implies that a

[63] 44% of housing in South Norfolk, 30% in Norwich and 26% in Broadland

[64] Office for Budget Responsibility (July 2018) Fiscal Sustainability Report

further fall in unemployment is unlikely to be achieved consistently over the plan period and should not be relied upon.

- A fixed proportion of employed people are assumed to occupy more than one job, based on local evidence over the past ten years from the Annual Population Survey.

- The private household population is initially converted to households through the application of official 2014-based headship rates, although these rates are locally adjusted to facilitate a full return to the higher rates of younger household formation recorded in 2001 where this is not already assumed within ten years (2030). Original trends are continued thereafter if an improvement is projected, otherwise the headship rates remain fixed.

- Households are converted to dwellings by applying the vacancy rate recorded in each authority at the 2011 Census.

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