1.0 Introduction

1.1 Instructions

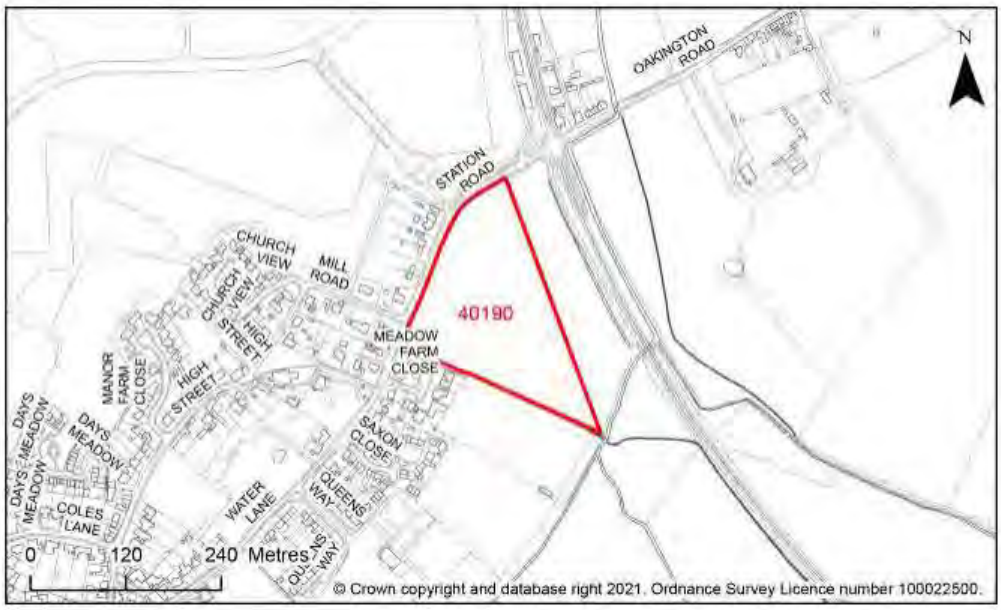
1.1.1 MAC Pre-planning Engineering have been appointed by Carter Jonas on behalf of Cambridgeshire County Council to assess the flood risk from all sources of site 40190 as identified in the draft Greater Cambridge Local Plan.

1.2 Site Location

1.2.1 Site 40190 is located at Mansel Farm, Station Road, Oakington as shown in Error! Appendix A and Inset 1.2 below. The approximate National Grid Reference for the site is E541759 N264897.

Inset 1.1: Site location Plan

Inset 1.2: Draft Allocation Plan



1.3 Current Use and Description

1.3.1 The site currently comprises agricultural land. There has been no previous development on the site. The existing site is shown on the topographical survey enclosed in Error! Appendix A

1.3.2 There nearest watercourse Beck Brook is located adjacent to the southeastern most corner of the site. The site falls approximately 2m across the site from Station Road towards Beck Brook.

1.4 Proposed Development

1.4.1 The proposed development would comprise residential dwellings.

1.4.2 In line with paragraph 26 of the Planning Practice Guidance for 'Flood risk and climate change' the lifetime of a residential development is considered to be at least 100 years.

1.4.3 The 'Flood Risk Vulnerability Classification' of various development types is defined within Annex 3 of the National Planning Policy Framework (NPPF) – July 2021. A residential development is classified as a More Vulnerable development. The relevant extract from Annex 3 of the NPPF is set out below.

2.0 Site Specific Flood Risk

2.1 Risk of Fluvial / Tidal Flooding

2.1.1 The likelihood of fluvial and tidal flooding is defined on the Environment Agency's map 'Flood Map for Planning'. This flood map is published on the gov.uk website.

2.1.2 An extract of this flood map is provided below in **Inset 2.1**. The approximate site boundary is shown in red.

Inset 2.1: Fluvial / Tidal Flood Risk - gov.uk – 10/12/2021

2.1.3 The Environment Agency's flood map shows that the proposed development site is located within Flood Zone 1 (Low Probability), Flood Zone 2 (Medium Probability) and Flood Zone 3 (High Probability) and as such, the development is at a low (less than 1 in 1000 years) to high (greater than 1 in 100 years) risk of flooding from rivers or the sea.

2.1.4 As the site is located partially within Flood Zone 3, flood level information has been obtained from the Environment Agency. A copy of the flood level information is enclosed in **Appendix B**. The worst-case modelled flood node to the development site is EA052126515 located adjacent to the southern corner of the site. Flood level information as provided by the Environment Agency for this flood node is shown in **Table 2.1** below.

Table 2.1: Flood Level Data

Annual Exceedance Probability Maximum Water Level (mODN)				
Node	**5% (1 in 20)**	**2% (1 in 50)**	**1% (1 in 100)**	**0.5% (1 in 200)**
EA052126515	7.86	8.07	8.25	8.45

2.1.5 New Climate Change allowances were published by the Environment Agency in July 2021. The new data included changes to peak river flow climate change requirements which are now set on a basin and catchment basis.

2.1.6 The proposed development is located within the Anglian basin and Cam and Ely Ouse Management Catchment. The proposed development is classified as More vulnerable as such the central climate change allowance is applicable. For this basin and catchment the applicable central climate change allowance is 9%.

2.1.7 The Environment Agency have not provided climate change flood levels or any flow data, however, it is felt that the 0.5% (1 n 200 year) would work as a proxy for a 9% climate change allowance and would most likely represent a conservative worst case assessment.

2.1.8 The predicated flood levels for the 1% (100yr) and 0.5% (200yr) events shown in **Error!** Appendix B . have been plotted onto the topographical survey on a drawing enclosed in **Appendix C**. This plan shows the extent of Flood Zones 3 across the site which closely correlates with the published fluvial flood risk map suggesting that the extent of Flood Zone 1 shown on flood risk map will also be broadly accurate thus dwellings could be appropriately located within Flood Zone 1 and at a low risk of fluvial flooding.

2.1.9 Based on this assessment the proposed development is located within Flood Zones 1, 2 (extent to be defined) and 3 is defined as having a less than 1 in 1000 annual probability to more than 1 in 100.

2.1.10 The extent of Flood Zone 3 and anticipated extent of Flood Zone 2 would provide scope for dwellings to be provided entirely within Flood Zone 1 as such sequentially located to be at the lowest risk of flooding

Additional Fluvial Flooding Data

2.1.11 To the north of the site there is a development of up to 4000 dwellings plus other amenities known as Northstowe. The planning application (ref 20/02171/OUT) for Northstowe Phase 3A was supported by a Flood Risk Assessment & Drainage Strategy prepared by Arcadis report reference 10019646-ARC-XX-XX-RP-DE-0001 dated 17/04/2020.

2.1.12 This report included images showing flood modelling extents for the 0.5% (200yr) and 0.1% (1000yr) flood events. Whilst considering the development site the modelling also shows flood extents for the proposed allocated site (Mansel Farm 40190). From these modelling extents it is shown that the site does not flood in either the 0.5% or 0.1% events which suggests that the Environment Agency's modelling is conservative and the site is actually located entirely within Flood Zone 1.

2.1.13 Independent flood modelling would be undertaken prior to any planning application to demonstrate this.

Flood Compensation

2.1.14 As any dwellings would be located within Flood Zone 1 as such there would be no need for flood compensation.

Flood Resilience Measures and Warnings

2.1.15 Finished floor levels on the site will be located some 300mm above the predicted 1% (1 in 100) plus climate change flood event.

2.2 Risk of Surface Water Flooding

2.2.1 The likelihood of surface water flooding is defined on the Environment Agency's map 'Flood risk from surface water'. This flood map is published on the gov.uk website.

2.2.2 An extract of this flood map is provided below in **Inset 2.2**. The approximate site boundary is shown in red.

2.2.3 Regarding the accuracy of this map the EA state that:

"Flooding from surface water is difficult to predict as rainfall location and volume are difficult to forecast. In addition, local features can greatly affect the chance and severity of flooding. Because of this, we report the highest risk within 20m of a specific location, such as an individual property. This means reports for neighbouring properties may show different levels of risk."

Inset 2.2: Surface Water Flooding - gov.uk – 10/12/21

2.2.4 The site is predominantly located in an area of very low surface water flood risk. However, there are isolated areas of low surface water flood risk on the site predominately in the south-eastern corner of the site where the levels drop away significantly. In the south-eastern corner of the site there are small areas of medium surface water flood risk. The raised areas of flooding in this location are unlikely to be developed due to the 'point' formed within the site.

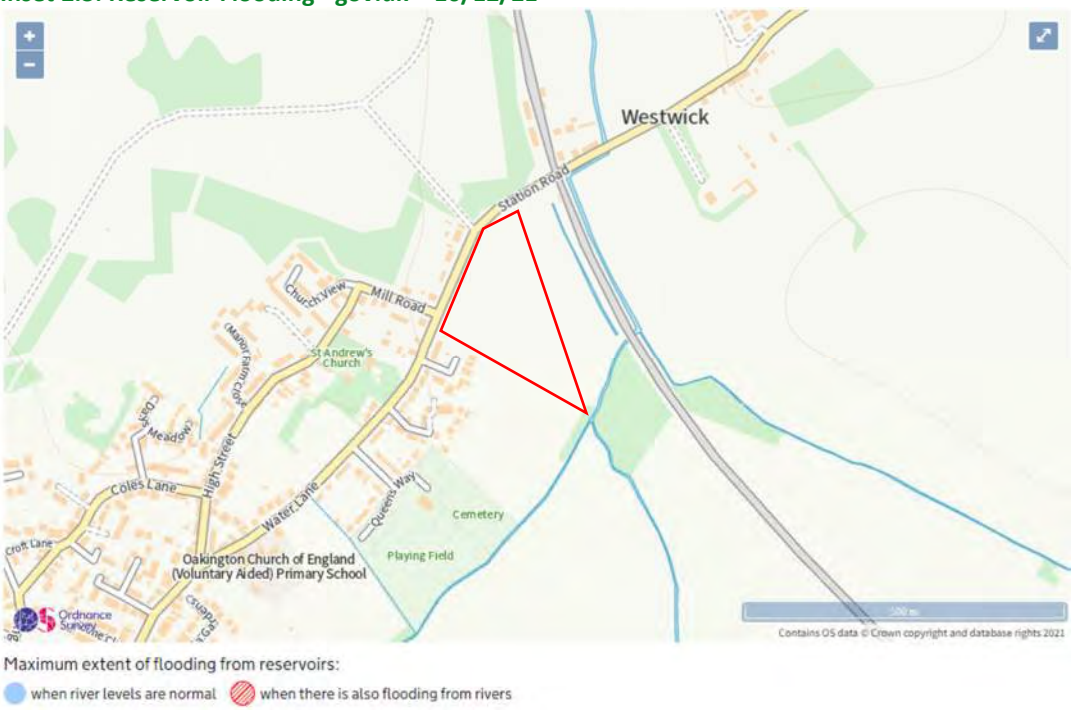
2.2.5 Development on the site will be focused to areas of very low surface water flood risk which comprises the majority of the site.

2.3 Risk of Reservoirs, Canals and Other Artificial Sources Flooding

2.3.1 The likelihood of reservoir water flooding is defined on the Environment Agency's map 'Flood Risk from Reservoirs'. This flood map is published on the gov.uk website.

2.3.2 An extract of this flood map is provided below in **Inset 2.3**. The approximate site boundary is shown in red.

Inset 2.3: Reservoir Flooding - gov.uk – 10/12/21



2.3.3 The site is not at risk of reservoir flooding. We are not aware of any canals or other artificial sources which may cause flooding on the site.

2.4 Risk of Ground Water Flooding

2.4.1 We do not have any records of ground water flooding within the vicinity of the site. We therefore consider the risk of ground water sewer flooding to be low.

2.5 Risk of Sewer Flooding

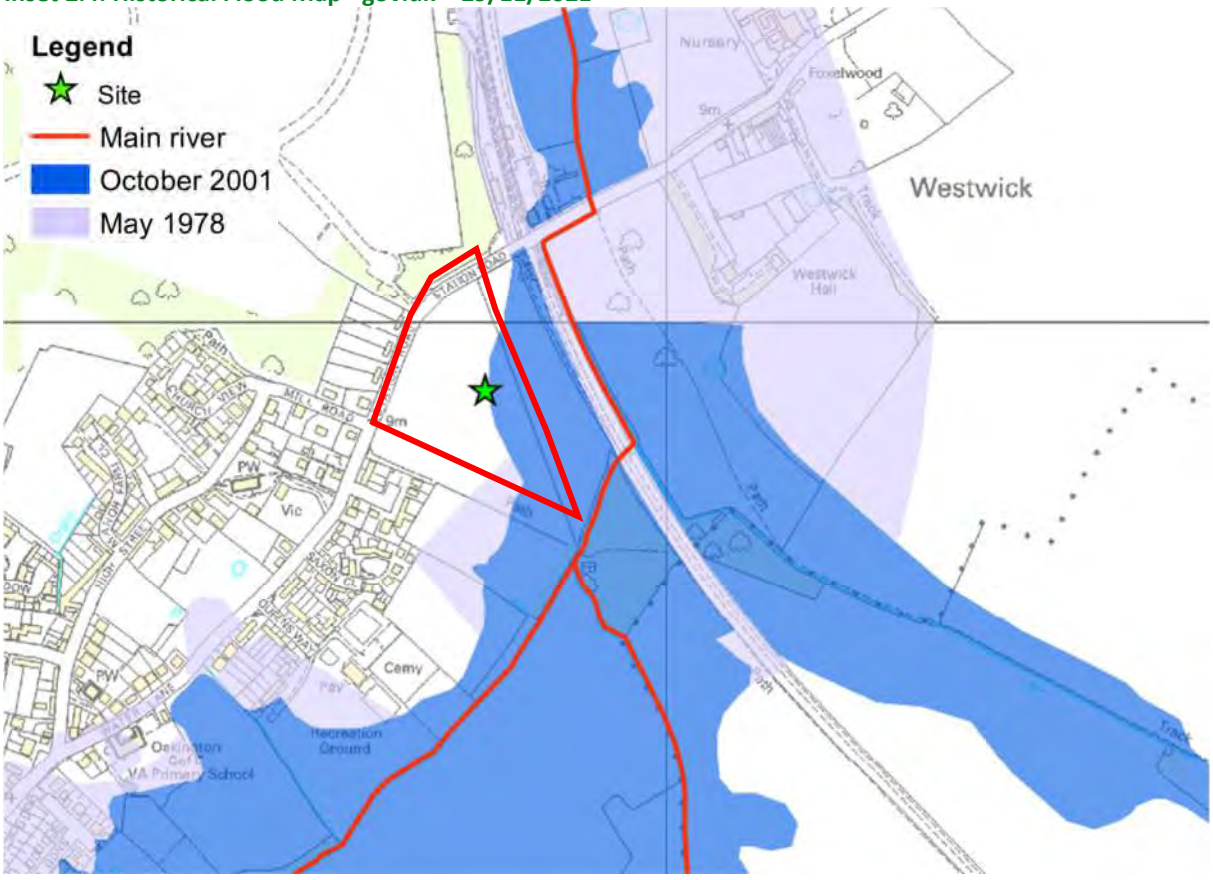
2.5.1 We do not have any records of sewer flooding within the vicinity of the site. We therefore consider the risk of sewer flooding to be low.

2.6 Previous Flood Events

2.6.1 The Environment Agency's "Historic Flood Map is a GIS layer showing the maximum extent of all individual Recorded Flood Outlines from river, the sea and groundwater springs that meet a set criteria. It shows areas of land that have previously been subject to flooding in England. Records began in 1946 when predecessor bodies to the Environment Agency started collecting detailed information about flooding incidents".

2.6.2 The Environment Agency flood map, extract in **Inset 2.4** below, shows that flooding occurred within the site during the May 1978 and October 2001 extreme flood event. A copy of the Environment Agency plan is enclosed in **Appendix B**.

Inset 2.4: Historical Flood Map - gov.uk – 29/11/2021



2.7 Summary of Flood Risk

2.7.1 Based on the Environment Agency's data the site is located within Flood Zones 1, 2 and 3 and is at a low risk of flooding from all other sources. It is proposed that any dwellings on the site would be located within Flood Zone 1 and as such at the lowest risk of fluvial flooding.

2.7.2 Additional evidence from an application site to the north would suggest that the whole site is located within Flood Zone 1 based on modelling completed for that development.

2.8 Flood Risk Vulnerability and Flood Zone 'Compatibility'

2.8.1 The suitability of different development types to be built and occupied within a particular Flood Zone is defined within Table 3 of the Planning Practice Guidance for 'Flood Risk and Coastal Change' to the National Planning Policy Framework. Table 3 is replicated below in **Table 2.2** below. This table maps vulnerability classes against the flood zones to indicate where development is 'appropriate' and where it should not be permitted.

2.8.2 Any dwellings on the proposed development site would be located within Flood Zone 1. Dwellings are classified as a More Vulnerable development. Based on this categorisation of the development it is considered 'appropriate'.

Table 2.2: Flood risk vulnerability and flood zone 'compatibility'

Flood Zone	Flood Risk Vulnerability Classification				
	Essential Infrastructure	Highly Vulnerable	More Vulnerable	Less Vulnerable	Water Compatible
Zone 1	✓	✓	✓	✓	✓
Zone 2	✓	Exception Test required	✓	✓	✓
Zone 3a †	Exception Test required †	×	Exception Test required	✓	
Zone 3b *	Exception Test required *	×	×	×	×

✓ Development is appropriate

✗ Development should not be permitted.

† In Flood Zone 3a essenNal infrastructure should be designed and constructed to remain operational and safe in times of flood.

" * " In Flood Zone 3b (functional floodplain) essential infrastructure that has to be there and has passed the Exception Test, and water-compatible uses, should be designed and constructed to:

- remain operational and safe for users in times of flood;
- result in no net loss of floodplain storage;
- not impede water flows and not increase flood risk elsewhere.

2.9 Sequential Test

As any dwellings would be located within Flood Zone 1 there would be no requirement for a Sequential Test.

3.0 Conclusions

3.1 Site location and proposed development

3.1.1 MAC Pre-planning Engineering have been appointed by Carter Jonas on behalf of Cambridgeshire County Council to assess the flood risk from all sources of site 40190 as identified in the draft Greater Cambridge Local Plan.

3.1.2 Site 40190 is located at Mansel Farm, Station Road, Oakington. The proposed development would comprise residential dwellings.

3.2 Flood Risk

3.2.1 Based on the Environment Agency's data the site is located within Flood Zones 1, 2 and 3 and is at a low risk of flooding from all other sources. It is proposed that any dwellings on the site would be located within Flood Zone 1 and as such at the lowest risk of fluvial flooding.

3.2.2 Additional evidence from an application site to the north would suggest that the whole site is located within Flood Zone 1 based on modelling completed for that development. Site specific flood modelling would be completed at planning application stage to demonstrate the exact extent of Flood Zone 1.

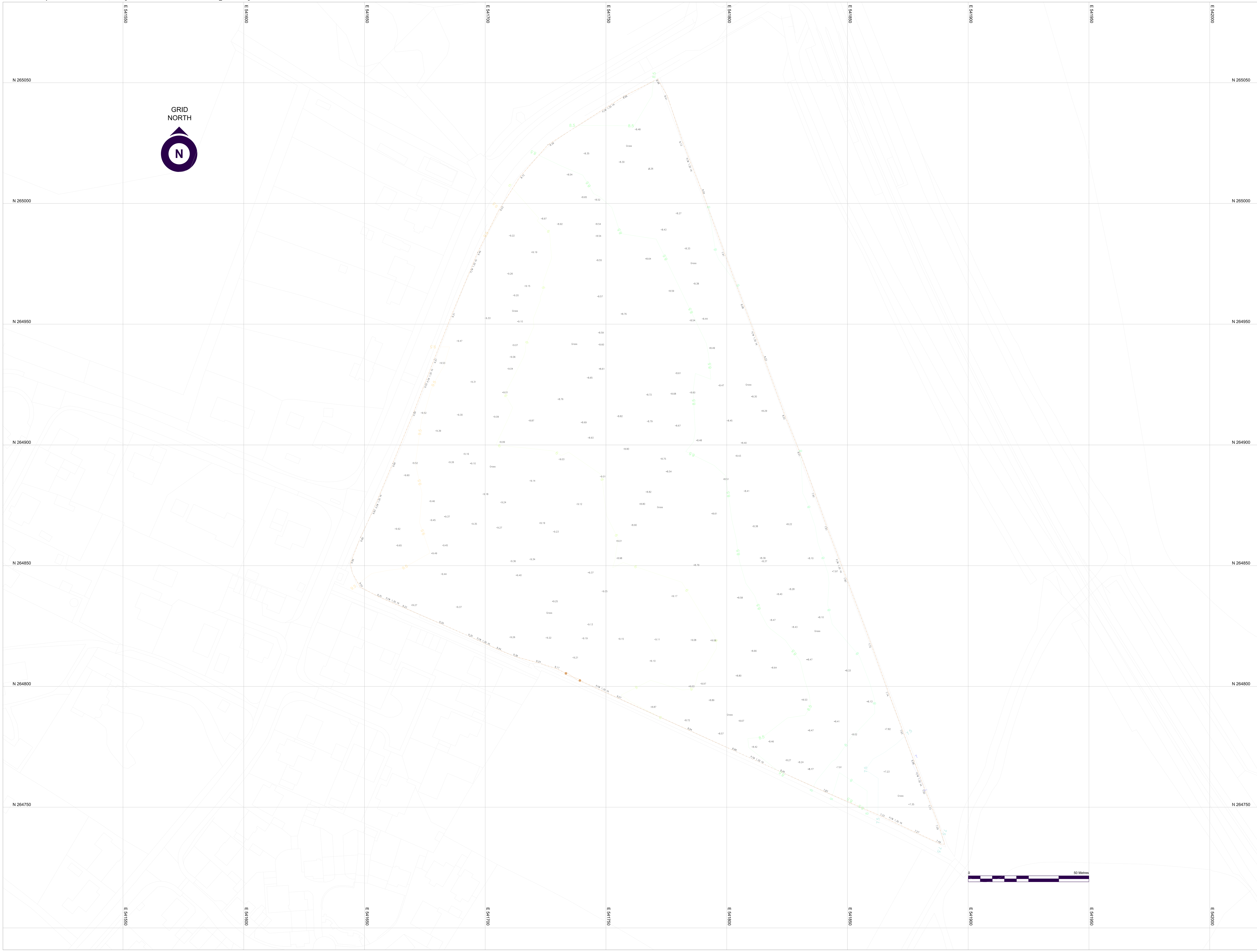
3.2.3 At least part of the site is located within Flood Zone 1 which could be used for dwellings. The Flood Zone 1 classification and the proposed development's vulnerability classification is compatible with the Flood Zone therefore the development is appropriate.

3.2.4 A Sequential Test would not be required as dwellings would be located within Flood Zone 1.

Appendix A

Topographical Survey
Carter Jonas drawing no. J0025883-21-01_Issue01

N:\Measured Surveys\J0025883 - Mansel Farm, Oakington\07 ISSUED\Issue01\J0025883-21-01_Issue01.dwg



SURVEY DRAWING NOTES

SURVEY CONTROL DETAILS

1. HORIZONTAL GRID

The survey is orientated to Ordnance Survey Grid North and is surveyed to a plane grid. All horizontal measurements and dimensions taken from this survey will be GROUND distance.

If required, full Ordnance Survey co-ordinates can be calculated by scaling the survey about the site centre, with co-ordinates
Easting 541774.98 Northings 265016.07 using the following scale factor value

Local Scale factor = 0.998390

This is derived using Trimble Business Center software Local Site Settings calculations
The control has been established by tying into the active Ordnance Survey control network as follows :
The co-ordinate system used for the primary control is OSGB36; this has been calculated from ETRS89 using the OSTN015 transformation parameters.

For this particular project, the TRIMBLE VRS NOW network has been used with observations taken on the following date(s) 24/11/2021

Manufacturers quoted accuracy is typically RMS 10 – 20 mm in plan and 20 – 30 mm in height. These values can however fluctuate depending upon time of day, satellite geometry and other conditions that could cause degradation to the final solutions. for salient control and wherever possible and practical, Carter Jonas have used an open sky with good satellite geometry so as to maintain the highest accuracy possible. Accuracy reports can be supplied of final observations accuracies if required.

Mean sea level corrections (MSL) are deemed to be insignificant and have therefore not been applied due to the low level of this site

2. VERTICAL DATUM:

Altitudes for the control have been calculated from GPS derived heights and converted to Orthometric heights (Ordnance Datum Newlyn - ODN) using OSGM15 transformation parameters.

3. This drawing is to be read in conjunction with all other relevant drawings :
4. Check scale bar and grid before taking non-figured dimensions from this drawing.
5. If there is any doubt please the Contact Carter Jonas measured surveys team.
6. Ordnance Survey data where used is reproduced from the Ordnance Survey Map with permission of the Controller of Her Majesty's Stationery Office. © Crown Copyright and database rights 2020 OS 100004458

LEGEND

BUILDING
GATE
HEDGE/ VEGETATION /TREE CANOPY
99.90 CONTOUR
+30.29 SPOT LEVEL
BANKING
STN/102 100.000 SURVEY STATION WITH LEVEL
SAPLING
FENCE & DESCRIPTION
TREE (INDICATIVE ONLY)

FENCE TYPE ABBREVIATIONS

B/W	Barbed wire	He	Heras
C/P	Chestnut Paling	I/R	Iron Railing
C/B	Close Boarded	P/W	Post and Wire
C/I	Corrugated Iron	P/R	Post and rail
C/L	Chain Link	P/C	POST AND CHAIN
C/Ba	Crash Barrier	P/Bw	POST AND BARBED WIRE
C/Pa	Concrete Panel	S/S	STEEL SECURITY
E/L	Electric	W/M	WIRE MESH
H/D	Hoarding		

SURVEY PLAN ABBREVIATIONS

BOL	BOLLARD	LP	LAMP POST
BBE	BELISHA BEACON	MKR	MARKER POST
BH	BOREHOLE	MH	MANHOLE
BP	BOUNDARY POST	MP	MILE POST
BS	BUS STOP	OHC	OVERHEAD CABLES
BT	BRITISH TELECOM IC	PI	PIPE
CATV	CABLE TELEVISION IC	PM	PARKING METER
CCTV	CLOSE CIRCUIT TV	PO	POST
CBX	CONTROL CABINET	PYL	ELECTRIC PYLON
CL	COVER LEVEL	RE	RODDING EYE
COL	COLUMN	RF/RG	ROOF/RIDGE LEVEL
CP	CATCH PIT	NP	NAME PLATE
CTV	CABLE TELEVISION POINT	RS	ROAD SIGN
DK	DROP KERB	RWP	RAINWATER PIPE
DRN	DRAIN	SC	STOP COCK
DWP	DOWN WATER PIPE	SFL	SOFFIT LEVEL
DP	DOWN PIPE	Slev	SILL LEVEL
EC	ELECTRICITY CONTROL BOX	SPO	SIGN POST/BOARD
ECB	ELECTRICITY CABLE	ST	STOP TAP
EV	EAVES LEVEL	STP	STUMP
EP	ELECTRICITY POLE	SV	STOP VALVE
ER	EARTH ROD	SW	STORM WATER
FFL	FINISHED FLOOR LEVEL	TAP	WATER TAP
FH	FIRE HYDRANT	TBX	TELEPHONE CALL BOX
FL	FLOOD LIGHT	THL	THRESHOLD LEVEL
G	GULLY	TL	TRAFFIC LIGHT
GV	GAS VALVE	TP	TELEPHONE POLE
GP	GATE POST	TRAIL PIT	TPIT
HLev	HEAD LEVEL	TW	TOP OF WALL
IC	INSPECTION COVER	SVP	SOIL & VENT PIPE
IL	INVERT LEVEL	WL	WATER LEVEL
KB	KERB	WM	WATER METER
KO	KERB OUTLET GULLY	WV	WATER VALVE
LB	LITTER BIN	WO	WASH OUT

GENERAL

A. NO ALLOWANCE HAS BEEN MADE FOR SUB SURFACE ENTRY INTO MANHOLES OR OTHER CHAMBERS OR VOIDS BELOW GROUND LEVEL. THEREFORE ANY DETAILS RELATING TO DEPTHS, SIZES ETC. ARE TAKEN FROM ABOVE GROUND AND AS SUCH WILL BE APPROXIMATE ONLY.
B. THE CONTRACTOR IS TO CHECK AND VERIFY ALL CRITICAL DIMENSIONS AND LEVELS BEFORE WORK STARTS.
C. BURIED SERVICES SHOWN ON THIS DRAWING MAY BE ASSUMED ROUTES AND WILL NORMALLY BE OF UNKNOWN CONDITION, CONTRACTORS SHOULD UNDERTAKE SUITABLE VALIDATION WORK AND TAKE PARTICULAR CARE DURING EXCAVATION WORK; SAFE DIGGING PRACTICES SHOULD BE FOLLOWED.
D. SHOULD THERE BE ANY CONFLICT BETWEEN THE DETAILS INDICATED ON THIS DRAWING AND THOSE INDICATED ON OTHER DRAWINGS, THEN CARTER JONAS SHOULD BE INFORMED PRIOR TO CONSTRUCTION ON SITE.
E. IT IS IMPORTANT TO NOTE THAT THE SAME ACCURACIES IMPLIED BY THE PLOTTING SCALE ARE EQUALLY APPLICABLE TO DIGITAL DATA SUPPLIED FOR CAD.
F. EVERY EFFORT IS MADE TO IDENTIFY ALL VISIBLE ABOVE GROUND FEATURES. HOWEVER, IT SHOULD BE BORNE IN MIND THAT THERE MAY BE ITEMS OBSCURED AT THE TIME OF SURVEY.
G. VISIBLE FEATURES IN THE VICINITY OF THE BOUNDARIES, AS SHOWN ON THIS SURVEY, MAY NOT REPRESENT THE EXTENT OF LEGALLY CONVEYED OWNERSHIP.
H. UNLESS OTHERWISE SPECIFIED FEATURES SHOWN USING LINE STYLES OR HATCHING ARE INDICATIVE ONLY, SUCH AS; ROAD MARKINGS, HEDGE CENTRELINES, BRICK HATCHING AND GLAZING DETAIL.

Issue	DATE	DESCRIPTION	DRAWN	CHKD

Carter Jonas
12 Waterside Way, Bedford Road,
Northampton, NN4 7XD
T:01604 608228
E:measuredsurveys@carterjonas.co.uk
www.carterjonas.co.uk

Client : CAMBRIDGE COUNTY COUNCIL

Project : MANSEL FARM, OAKINGTON

Title : TOPOGRAPHICAL SURVEY

Scale: 1:500@A0 Date: 24/11/2021
Drawn by: MT Surveyed by :MT
Checked by: MJ Dwg no:J0025883-21-01_Issue01

Appendix B

Environment Agency Flood Level Information

creating a better place

Environment Agency

Martin Andrews

martin.andrews@mac-ltd.co.uk

Our ref EAn2021/241141

Date 30 November 2021

Dear Martin

Enquiry regarding Product 4 for Station Road, Oakington

Thank you for your enquiry which was received on 12 November 2021.

We respond to requests under the Freedom of Information Act 2000 and Environmental Information Regulations 2004.

The information we hold and a copy of the Flood Risk Assessment (FRA) advisory note is attached to my email.

Further Asset Management Data and Information can be found online using this link: https://environment.data.gov.uk/asset-management/index.html

There are Environment Agency flood defences within 500m of this location, these defences are designated High Ground Only. We attach a map to aid your enquiry.

Name	Product 4
Description	Detailed Flood Risk Assessment Map for Station Road, Oakington
Licence	Open Government Licence
Information Warnings	The maps provided are to be used in conjunction with the **Datasheet**. Please read the Datasheet and take note of information contained within the **'Important Information'** section.
Information Warning - OS background mapping	*The mapping of features provided as a background in this product is © Ordnance Survey. It is provided to give context to this product. The Open Government Licence does not apply to this background mapping. You are granted a non-exclusive, royalty free, revocable licence solely to view the Licensed Data for non-commercial purposes for the period during which the Environment Agency makes it available. You are not permitted to copy, sub-license, distribute, sell or otherwise make available the Licensed Data to third parties in any form. Third party rights to enforce the terms of this licence shall be reserved to OS.*
Attribution	Contains Environment Agency information © Environment Agency and/or database rights. Contains Ordnance Survey data © Crown copyright 2017 Ordnance Survey 100024198.

Flood Map for Planning (Rivers and Sea)

The Flood Map for Planning (Rivers and Sea) can be viewed and downloaded as a PDF file on GOV.UK by following this link: **https://flood-map-for-planning.service.gov.uk**

Long Term Flood Risk Information

Long term flood risk mapping including: ***Risk of Flooding from Rivers or the Sea***, ***Flood Risk from Surface Water*** and ***Flood Risk from Reservoirs*** can be viewed on GOV.UK: **https://flood-warning-information.service.gov.uk/long-term-flood-risk/map**

Climate Change Allowances

The National Planning Practice Guidance refers planners, developers and advisors to the Environment Agency's guidance on considering climate change in Flood Risk Assessments (FRAs). This guidance was updated in October 2021 and is available at: **https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances**

The guidance provides climate change allowances for peak river flow, peak rainfall, sea level rise, wind speed and wave height. The guidance provides a range of allowances to assess fluvial flooding, which varies depending on which management catchment a site lies within. It advises on which allowances to use for assessing the impact of climate change on fluvial flood risk based on vulnerability classification, flood zone and development lifetime.

Data Available Online
Many of our flood datasets are available online:

- Flood Map For Planning (Flood Zone 2, Flood Zone 3 ,Flood Storage Areas, Flood Defences, Areas Benefiting from Defences)
- Risk of Flooding from Rivers and Sea
- Historic Flood Map
- Current Flood Warnings

What's In Your BackYard (WIYBY) is no longer available
Most of the data is still available via other sharing services such as DATA.GOV.UK, MAGIC map and new GOV.UK digital services. Where the datasets are no longer available as maps, you will be able to download and use within specialist applications.

To find out all the services the Environment Agency have available, please click here.

For any other enquiries please send your request to us at:
Enquiries_EastAnglia@environment-agency.gov.uk.

Additional information

Please be aware that we now charge for planning advice provided to developers, agents and landowners. If you would like advice to inform a future planning application for this site then please complete our https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion and email it to our Sustainable Places team at: planning.brampton@environment-agency.gov.uk. They will initially provide you with a free response identifying the following:

East Anglia Area
Ipswich Office, Iceni House, Cobham Road, Ipswich, Suffolk, IP3 9JD
Brampton Office, Bromholme Lane, Brampton, Huntingdon, PE28 4NE
General Enquiries: 03708 506506
Email: enquiries@environment-agency.gov.uk
Website: https://www.gov.uk/government/organisations/environment-agency

- the environmental constraints affecting the proposal;
- the environmental issues raised by the proposal;
- the information we need for the subsequent planning application to address the issues identified and demonstrate an acceptable development;
- any required environmental permits.

If you require any further information from them (for example, a meeting or the detailed review of a technical document) they will need to set up a charging agreement. Further information can be found on our website.

Climate Change Allowances

The National Planning Practice Guidance refers planners, developers and advisors to the Environment Agency's guidance on considering climate change in Flood Risk Assessments (FRAs). This guidance was updated in October 2021 and is available at: https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances

The guidance provides climate change allowances for peak river flow, peak rainfall, sea level rise, wind speed and wave height. The guidance provides a range of allowances to assess fluvial flooding, which varies depending on which management catchment a site lies within. It advises on which allowances to use for assessing the impact of climate change on fluvial flood risk based on vulnerability classification, flood zone and development lifetime.

If you want to discuss this please call our Sustainable Places team on 020 8474 5242.

Please get in touch if you have any further queries or contact us within two months if you'd like us to review the information we have sent.

Yours sincerely

Anna Butcher
Customers and Engagement Officer

Direct dial: 02030 255472

Use of Environment Agency Information for Flood Risk Assessments

Important

The Environment Agency are keen to work with partners to enable development which is resilient to flooding for its lifetime and provides wider benefits to communities. If you have requested this information to help inform a development proposal, then we recommend engaging with us as early as possible by using the pre-application form available from our website:

https://www.gov.uk/government/publications/pre-planning-application-enquiry-form-preliminary-opinion

We recognise the value of early engagement in development planning decisions. This allows complex issues to be discussed, innovative solutions to be developed that both enables new development and protects existing communities. Such engagement can often avoid delays in the planning process following planning application submission, by reaching agreements up-front. We offer a charged pre-application advice service for applicants who wish to discuss a development proposal.

We can also provide a preliminary opinion for free which will identify environmental constraints related to our responsibilities including flooding, waste, land contamination, water quality, biodiversity, navigation, pollution, water resources, foul drainage or Environmental Impact Assessment.

In preparing your planning application submission, you should refer to the Environment Agency's Flood Risk Standing Advice and the Planning Practice Guidance for information about what flood risk assessment is needed for new development in the different Flood Zones. This information can be accessed via:

https://www.gov.uk/flood-risk-assessment-standing-advice
http://planningguidance.planningportal.gov.uk/

You should also consult the Strategic Flood Risk Assessment or other relevant materials produced by your local planning authority.

You should note that:

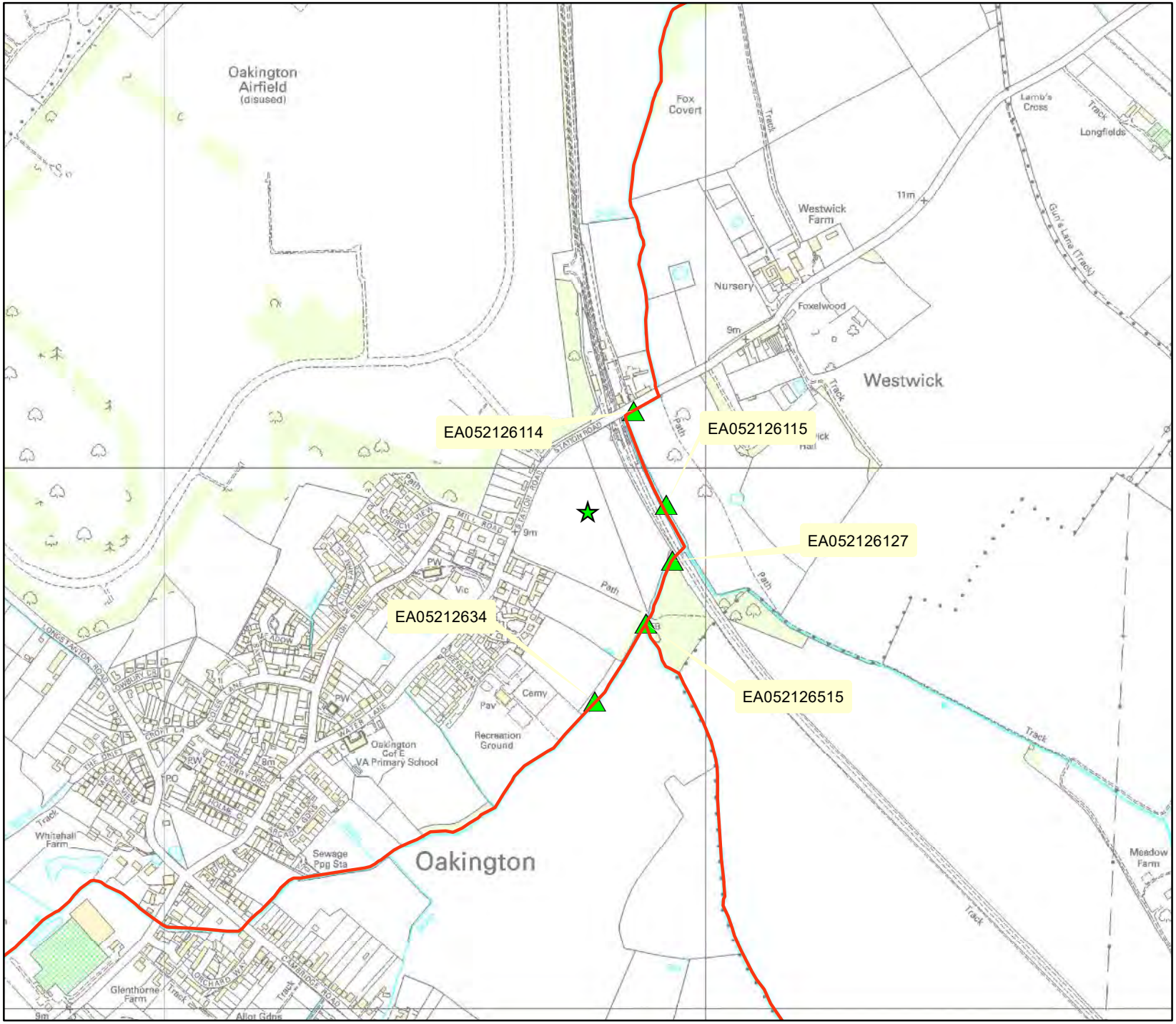
1. Information supplied by the Environment Agency may be used to assist in producing a Flood Risk Assessment (FRA) where one is required, but does not constitute such an assessment on its own.

2. This information covers flood risk from main rivers and the sea, and you will need to consider other potential sources of flooding, such as groundwater or surface water runoff. Information produced by the local planning authority referred to above may assist here.

3. Where a planning application requires an FRA and this is not submitted or is deficient, the Environment Agency may raise an objection.

Modelled Node Point Locations centred on Station Road, Oakington

NGR TL4178264917
Ref 241141
Created 29/11/2021



Environment Agency
Bromholme Lane,
Brampton,
Cambridgeshire
PE28 4NE

Legend

- Site
- Main river
- Node Points selection

0 0.125 0.25 0.5 km

Information

Model Tolerance - Any data included in this product is subject to a standard modelling tollerance of +/- 150mm.The fluvial models used to produce these results are intended for strategic scale use only.

Flood Risk Assessments - The Environment Agency recommends any Flood Risk Assessment should only consider these results in the context of a site specific assessment.

AEP - Annual Exceedance Probability - The probability of a given event occurring in any one year. Please note this is not a return period.

Strategic Scale Model - This model has been designed for catchment wide flood risk mapping. It should be noted that it was not created to produce flood levels for specific development sites within the catchment. Modelled outlines take into account catchment wide defences if present.

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY Tel: 03708 506 506 (Mon-Fri 8-6).
Email: enquiries@environment-agency.gov.uk

Datasheet - Product 4

29 November 2021

Reference Number	241141
Site	AR02 Station Road, Oakington
Customer	Martin Andrews
NGR	TL4178264917

This datasheet provides supporting information for your Product 4. It will be clearly indicated if we are unable to provide information to fulfil any part of your request.

Model Summary

Model Name	Model Code
Cottenham Lode PFS	EA05246

Important Information

The following information should considered when using the material provided to fulfil this request.

Information	
No Product 8 Data	Unfortunately we do not have any breach data at this location.
Limited Modelled Extents Provided	We have only provided a limited number of modelled flood extents for clarity. If you require further extents we will be happy to provide them.

Modelled Water Levels and Flows

The following tables provide modelled in channel water level and flow values. Values are provided for Annual Exceedence Probability (AEP) events, which is the probability of a given event occurring in any one year. This is not a return period.

The fluvial models used to produce these results are intended for strategic scale use only.

If the tables show a value of -9999, this indicates that we have no level or flow data for that particular AEP or node point.

Level Data

Level values are measured in metres above Ordnance Datum (m aOD).

All level data included are subject to standard modelling tolerance of +/-150 millimetres.

Present Day Levels

Node	Model	Easting	Northing	20%	10%	5%	4%	2%	1.33%	1%	0.5%	0.1%
EA052126114	EA05246	541867	265104	7.56	7.71	7.86	-9999	8.02	-9999	8.14	8.25	-9999
EA052126115	EA05246	541927	264930	7.57	7.72	7.87	-9999	8.03	-9999	8.14	8.26	-9999
EA052126127	EA05246	541939	264827	7.6	7.74	7.88	-9999	8.05	-9999	8.19	8.35	-9999
EA05212634	EA05246	541795	264566	7.63	7.77	7.93	-9999	8.11	-9999	8.28	8.48	-9999
EA052126515	EA05246	541890	264711	7.59	7.72	7.86	-9999	8.07	-9999	8.25	8.45	-9999

Climate Change Levels

Node	Model	Easting	Northing	1%+20%cc	1%+25%cc	1%+35%cc	1%+65%cc	0.5%+20%cc	0.1%+20%cc
EA052126114	EA05246	541867	265104	-9999	-9999	-9999	-9999	-9999	-9999
EA052126115	EA05246	541927	264930	-9999	-9999	-9999	-9999	-9999	-9999
EA052126127	EA05246	541939	264827	-9999	-9999	-9999	-9999	-9999	-9999
EA05212634	EA05246	541795	264566	-9999	-9999	-9999	-9999	-9999	-9999
EA052126515	EA05246	541890	264711	-9999	-9999	-9999	-9999	-9999	-9999

Flow Data

Flow values are measured in cubic metres per second (cumecs - m3/s).

Present Day Flows

Node	Model	Easting	Northing	20%	10%	5%	4%	2%	1.33%	1%	0.5%	0.1%
EA052126114	EA05246	541867	265104	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
EA052126115	EA05246	541927	264930	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
EA052126127	EA05246	541939	264827	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
EA05212634	EA05246	541795	264566	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999
EA052126515	EA05246	541890	264711	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999	-9999

Climate Change Flows

Node	Model	Easting	Northing	1%+20%cc	1%+25%cc	1%+35%cc	1%+65%cc	0.5%+20%cc	0.1%+20%cc
EA052126114	EA05246	541867	265104	-9999	-9999	-9999	-9999	-9999	-9999
EA052126115	EA05246	541927	264930	-9999	-9999	-9999	-9999	-9999	-9999
EA052126127	EA05246	541939	264827	-9999	-9999	-9999	-9999	-9999	-9999
EA05212634	EA05246	541795	264566	-9999	-9999	-9999	-9999	-9999	-9999
EA052126515	EA05246	541890	264711	-9999	-9999	-9999	-9999	-9999	-9999

Recorded Flood Events

Where included, the Recorded Flood Event Outlines map provides an indication of areas which have flooded. Not all properties shown to be within the outline will have flooded.

Flood Event	Start	End	Source	Cause
Oct 2001	21/10/2001	24/10/2001	Main River	Channel Capacity Exceeded (no raised defences)
May 1978	05/05/1978	08/05/1978	Main River	Channel Capacity Exceeded (no raised defences) / Local Drainage/Surface Water / Obstruction/Blockage - Bridge

General Information

Flood Map for Planning (Rivers and Sea)

The Flood Map for Planning (Rivers and Sea) indicates the area at risk of flooding for a flood event with a 0.5% chance of occurring in any year for flooding from the sea, or a 1% chance of occurring in any year for fluvial (river) flooding (Flood Zone 3).

It also shows the extent of the Extreme Flood Outlines (Flood Zone 2) which represents the extent of a flood event with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater. The Flood Zones refer to the land at risk of flooding and do not refer to individual properties.

The Flood Map for Planning (Rivers and Sea) can be viewed and downloaded as a PDF file on GOV.UK by following this link: https://flood-map-for-planning.service.gov.uk or downloaded in GIS format under an open data licence from the following address: https://data.gov.uk/publisher/environment-agency

The Flood Map is updated on a quarterly basis to account for any amendments required.

Surface Water, Ordinary Watercourses and Groundwater Flooding

Lead Local Flood Authorities (LLFA) are responsible for managing local flood risk from ordinary watercourses, surface water flooding and groundwater flooding. You should check with the LLFA as they may have more up to date information regarding this type of flooding.

The Risk of Flooding from Surface Water Flood Map can be viewed and downloaded as a PDF file on GOV.UK by following this link: https://flood-warning-information.service.gov.uk/long-term-flood-risk

Information on how to reduce the impact of flooding from groundwater can be found online by the following link: https://www.gov.uk/government/publications/flooding-from-groundwater

Flooding from Reservoirs

The Risk of Flooding from Reservoirs Flood Map can be viewed and downloaded as a PDF file on GOV.UK by following this link: https://flood-warning-information.service.gov.uk/long-term-flood-risk

Sewer Flooding

Your local water company may have information on sewage flooding in your area of interest.

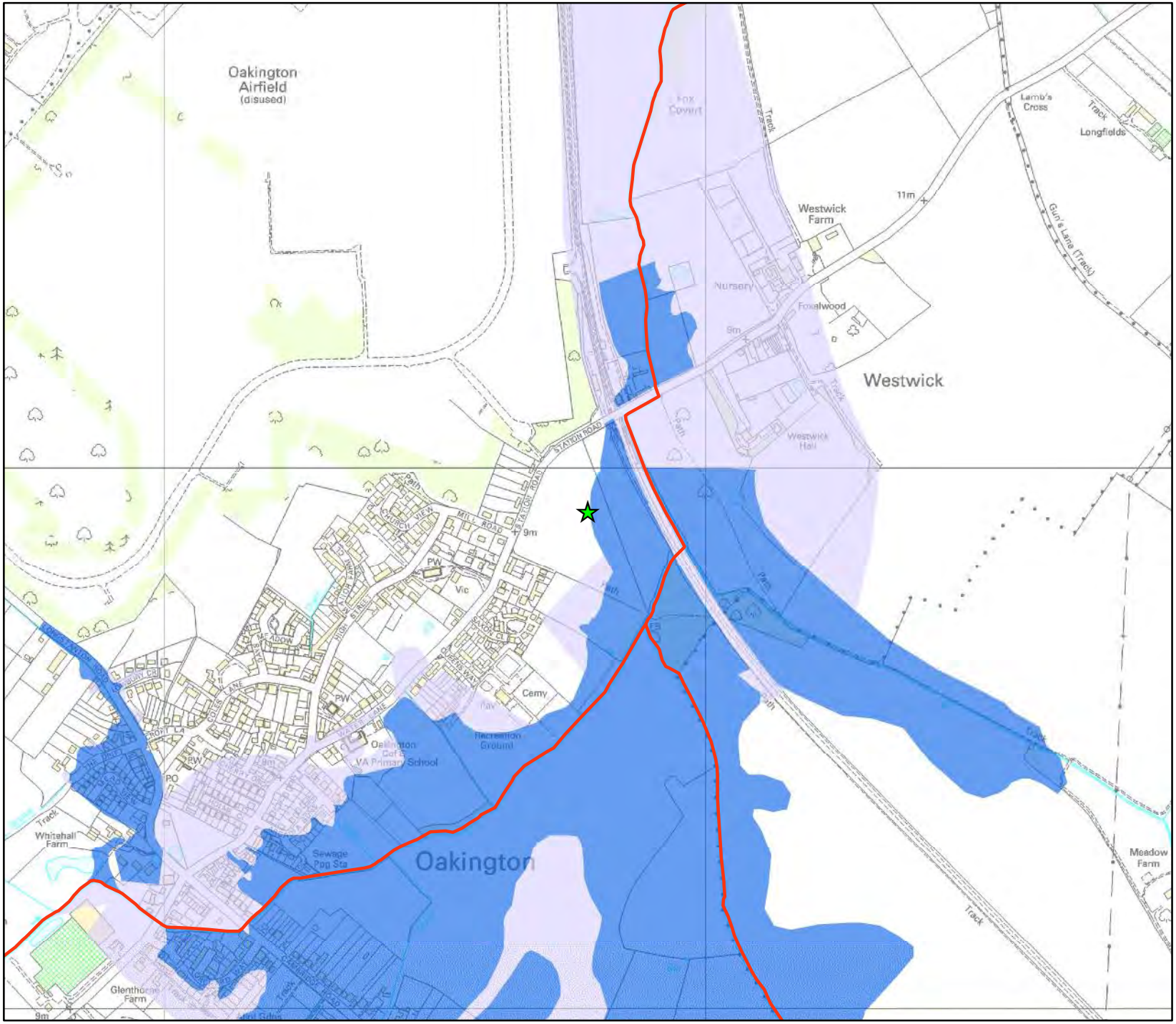
Areas Benefitting from Defences

Areas Benefitting from Defences show the area benefiting from defences from a 1 in 100 (1% AEP) year fluvial event or a 1 in 200 (0.5% AEP) tidal/coastal event.

The associated dataset can be downloaded in GIS from the following link: https://data.gov.uk/dataset/flood-map-for-planning-rivers-and-sea-areas-benefiting-from-defences

Recorded Flood Event Outlines centred on Station Road, Oakington

NGR TL4178264917
Ref 241141
Created 29/11/2021



Environment Agency
Bromholme Lane,
Brampton,
Cambridgeshire
PE28 4NE

Environment Agency

Legend

- Site
- Main river
- October 2001
- May 1978

0 0.125 0.25 0.5 km

Information

Recorded Outlines - The recorded flood outlines provided are only indicative and may not accurately represent the area that flooded in the named events. Our historic flood event outlines do not provide a definitive record of flooding. It is possible that there will be an absence of datail in places where we have not been able to record the extent of flooding. It is also possible for errors occur in the digitisation of historic records of flooding.

Recorded Outlines - There may be other flood events that have occurred that we have not been able to produce an outline for.

Recorded Outlines - The historic flood event outlines are based on a combination of anecdotal evidence, Environment Agency staff observations and survey.

Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY Tel: 03708 506 506 (Mon-Fri 8-6).
Email: enquiries@environment-agency.gov.uk

241141 Product 4 Map

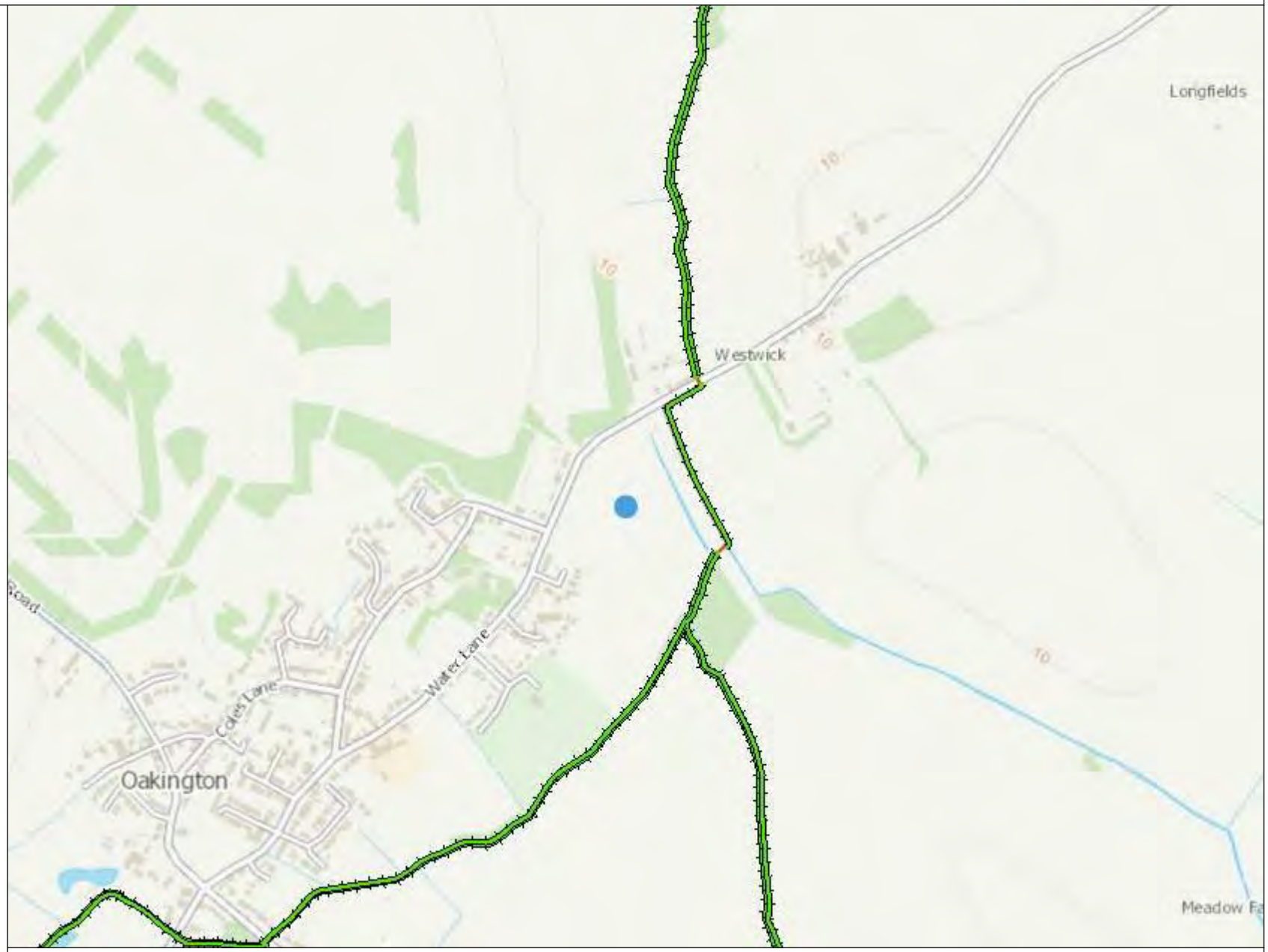
Environment Agency

Legend

Defences (EA maintained)

- Asset type not defined
- Embankment
- Wall
- Flood Gate
- Demountable Defence
- Bridge Abutment
- High Ground
- Beach
- Barrier Beach
- Promenade
- Quay
- Cliff
- Dunes

Statutory Main Rivers



1: 10,000

0 250

Metres

N W E S

Product 4 Request							
Unique ID (Label)	Easting	Northing	Standard of Protection (Return Period)	Overall Condition Grade	Statutory Defence Level	Upstream Crest Level	Downstream Crest Level
145373	541909	265152	Not Known	3	Not Known	7.47	6.74
145375	541909	264953	Not Known	3	Not Known	6.74	7.41
145376	541957	264867	Not Known	3	Not Known	7.42	6.74
145377	541962	264846	Not Known	3	Not Known	6.22	7.42
146811	541931	264826	Not Known	4	Not Known	7.32	6.15
146812	541885	264698	Not Known	3	Not Known	7.2	7.74
147010	541932	264820	Not Known	4	Not Known	7.38	7.14
147011	541951	264605	Not Known	4	Not Known	7.58	7.38
80909	541903	265156	Not Known	4	Not Known	5.54	5.32
101248	541879	264690	Not Known	3	Not Known	7.77	7.05
100537	541882	264701	Not Known	3	Not Known	8.62	7.88

Appendix C

1% and 0.5% Flood Extents
MAC drawing no. 685-FRA10

NORTH

Notes:

1. Based on Carter Jonas 'Topographical Survey', drawing number J0025883-21-01_Issue01 dated 24/11/2021.

Key:

- Approximate Site Boundary
- Flood levels taken from flood node EA052126515
- Extent of 1% (100yr) event - up to 8.25m AOD
- Extent of 0.5% (200yr) event - up to 8.45m AOD

Node EA052126515
1% (100yr) 8.25m AOD
0.5% (200yr) 8.45m AOD

T: 01604 340544 Northampton Office
E: info@mac-ltd.co.uk W: mac-ltd.co.uk
Martin Andrews Consulting Ltd

- Transport Assessments
- Flood Risk Assessments
- Highway Advice
- Access Design
- Drainage Strategies
- Vehicle tracking

Client: Cambridgeshire County Council		Project: Mansel Farm, Oakington	
Title: 1% and 0.5% Flood Extents			Date: 10/12/21
			Drw: MJA
			Chk: MJA
Drawing No: 685-FRA10	Revision: -		Scale: 1:1000
			Size: A3

Appendix D

Extracts from Northstowe Flood Risk Assessment by Arcadis

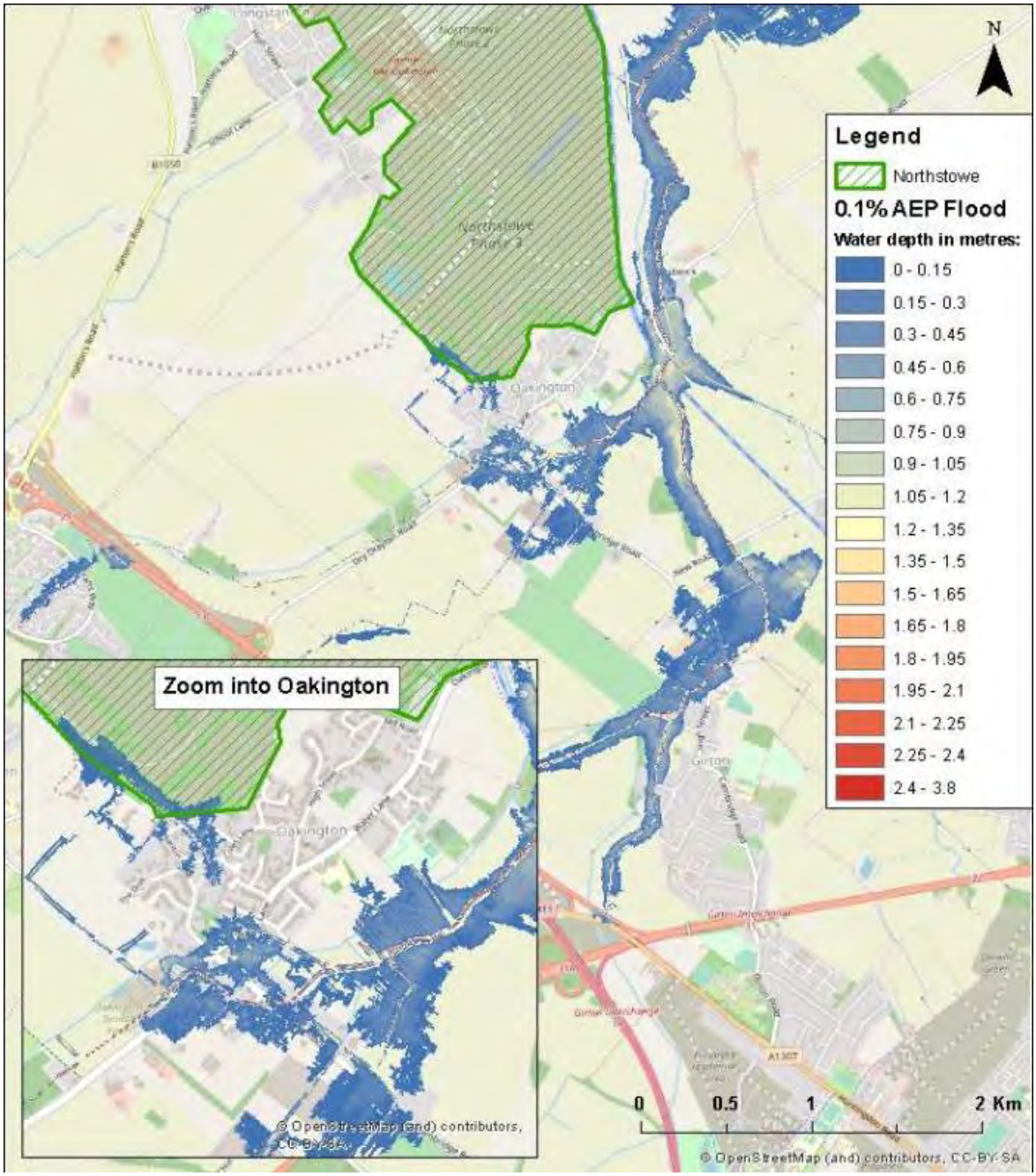


Figure 10: 0.1% AEP (including an allowance for climate change) predicted flood extent and depths from the Arcadis model

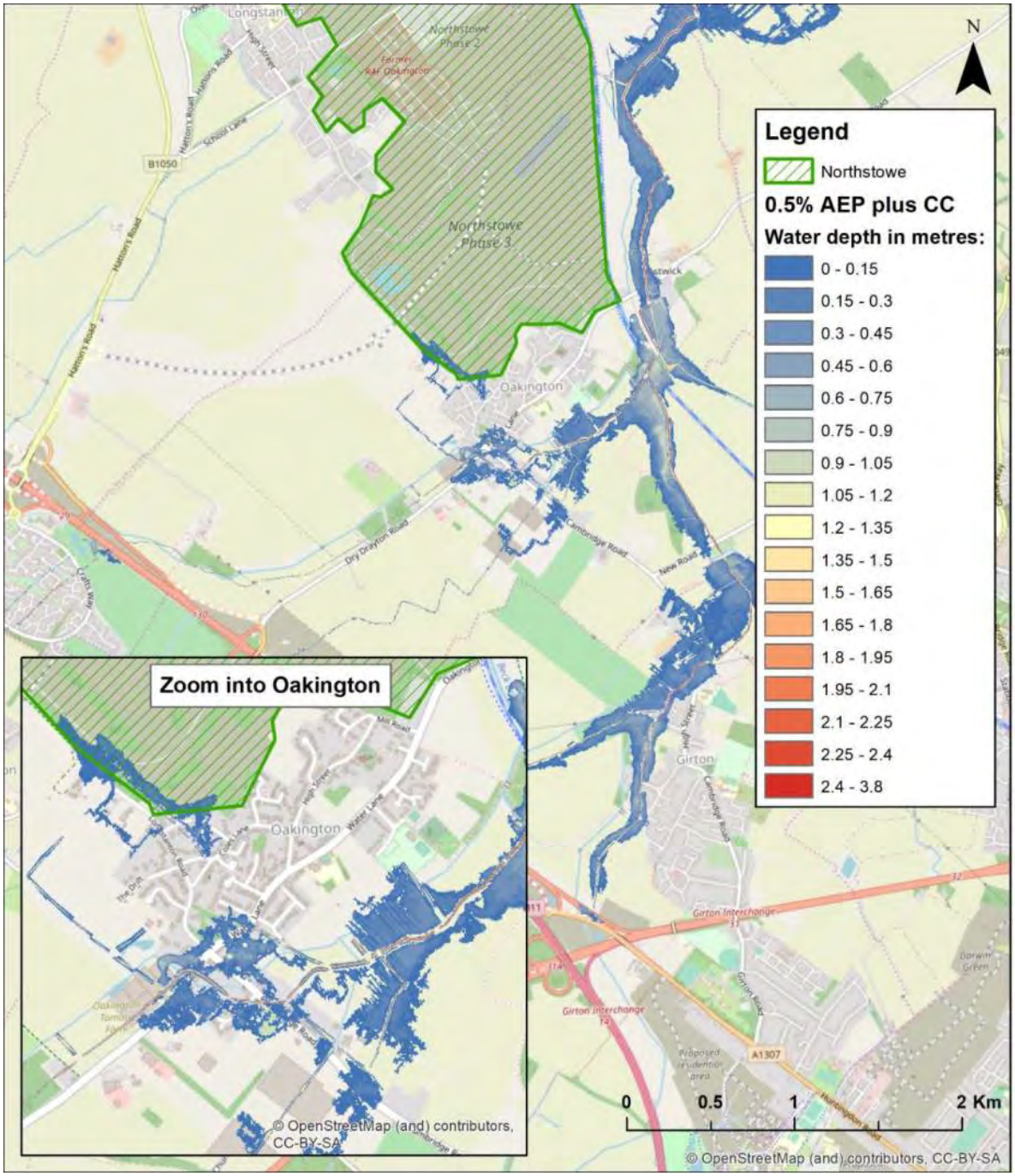


Figure 11: 0.5% AEP (including an allowance for climate change) predicted flood extent and depths from the Arcadis model

4.2.24 It can also be seen in ***Figure 9 to Figure 11*** above that water does appear to back up the Award Drain 171 due to lack of capacity within the Oakington Brook during extreme rainfall events. This could also be due to capacity within the Award Drain itself due to historic lack of maintenance.

4.2.25 It is therefore proposed that for the area of Northstowe Phase 3A that currently drains towards Oakington along this Award Drain, additional measures to retain surface water runoff onsite will be implemented in excess of policy requirements and best practice.