Flood Risk Assessment

Ringwood Lodge,
Browns Gate,
Sutton Crosses,
Long Sutton,
Lincolnshire,
PE12 9AU

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Notice

This Flood Risk Assessment is an assessment of all sources of flood risk associated with the proposed development. The information presented and conclusions drawn are based on statistical data and are for guidance purposes only. Subsequently, the conclusions drawn could differ if the information is found to be inaccurate, misleading or if additional information exists or becomes available.

This FRA has been prepared using our best engineering judgement, however, there are levels of uncertainty implicit in the historical data and methods of analysis. Subsequently, this report provides no guarantee against flooding of the site or surrounding catchment, nor does it provide guarantees as to the absolute accuracy of water levels, flow rates and associated probabilities quoted. The author of this report therefore accepts no liability should this be the case.

All Environment Agency mapping data used under special license. All data is current as of the date of issue of this document but may be subject to change.

EXECUTIVE SUMMARY

This Flood Risk Assessment (FRA) has been carried put in accordance with the requirements of the National Planning Policy Framework (NPPF) and the associated Planning Practice Guidance (PPG). This report is an assessment of all sources of flood risk associated with the proposed development.

The Environment Agency (EA) Mapping shows the site to located entirely within Flood Zone 3. The surface water (pluvial) flood maps suggest that the site is at very low risk of pluvial flooding.

The potential flood risks posed by sewers, reservoirs and groundwater sources are also considered to be low risk.

This report demonstrates that the proposed development is not at significant flood risk subject to the flood mitigation measure recommended within this report.

This Flood Risk Assessment has considered the current understanding of the impacts of climate change and has demonstrated that the development and its occupants will remain safe and operational from all sources of flood risk throughout the lifetime of the development.

This FRA has considered the current understanding of the impacts of climate change and has demonstrated that the proposed development; will remain safe and operational from all sources of flood risk, will not increase flood risk elsewhere throughout the lifetime of the development and is therefore compliant with the requirements of the National Planning Policy Framework (NPPF) and the Planning Practice Guidance (PPG) to the NPPF.

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1.0.0 INTRODUCTION

1.1.1 This Flood Risk Assessment (FRA) has been produced for the proposed development at land adjacent to Ringwood Lodge, Browns Gate, Long Sutton, Spalding, Lincolnshire, PE12 9AU.

1.1.2 This report is an assessment of all sources of flood risk associated with the proposed development. The information presented and conclusions drawn are based on statistical data and are for guidance purposes only.

1.1.3 The site is located entirely within Flood Zone 3. The surface water flood maps suggest that the site is considered to be at very low risk of pluvial flooding.

1.1.4 The EA Hazard Mapping shows the potential flooding consequences should a breach or overtopping of their sea defences occur. The EA Hazard Mapping includes an estimation of the likely flood depths, velocities and overall hazard that could impact the site in any one year up to 2115.

1.1.5 The Hazard Mapping suggests:

I. the site has a hazard classification of 'danger for some' in both the 0.5% (1 in 200) and 0.1% (1 in 1,000) year events,
II. the maximum depth of flooding in the 0.5% (1 in 200) year event is estimated to be between 0.0 and 0.25m and between 0.25 and 0.50m in the 0.1% (1 in 1,000) year event.
III. the maximum velocity of flooding is estimated to be between 0.0 and 0.3 m/s in both the 0.5% (1 in 200) and 0.1% (1 in 1,000) year events.

1.1.6 This FRA has taken into account the current understanding of the impacts of climate change and has demonstrated that the development will remain safe and operational from all sources of flood risk and will not increase flood risk elsewhere throughout the lifetime of the development and is therefore compliant with the requirements of the National Planning Policy Framework (NPPF) and the Planning Practice Guidance (PPG) to the NPPF.

1.1.7 This FRA has been prepared using our best engineering judgement, however, there are levels of uncertainty implicit in the historical data and methods of analysis. Subsequently, this report provides no guarantee against flooding of the study site or elsewhere, nor as to the absolute accuracy of water levels, flow rates and associated probabilities quoted.

1.1.8 This FRA is based on the following information:

- Environment Agency online Flood Maps for Planning (Rivers and Sea),
- Environment Agency online Flood Maps (Flood Risk from Surface Water),
- Environment Agency online Risk of Flooding from Reservoirs,
- Environment Agency Product 4 data,
- British Geological Survey maps,
- LiDAR data.

2.0.0 SITE LOCATION, DESCRIPTION AND DEVELOPMENT DETAILS

2.0.1 Table 1 below summarises the sites salient features.

Site Address	Ringwood Lodge, Browns Gate, Long Sutton, Spalding, Lincolnshire, PE12 9AU
Approximate National Grid Reference (NGR)	542928, 321317
Existing Development	Greenfield
Proposed Development	Residential Development
Flood Zone(s)	The site is located entirely located within Flood Zone 3
Surface Water Flooding	The EA Surface Water Flood maps suggest the site is considered to be at very low risk of pluvial flooding.

Table 1 – Site Summary

3.0.0 NATIONAL PLANNING POLICY FRAMEWORK (NPPF)

3.0.1 The National Planning Policy Framework (NPPF) clearly identifies flood risk as a specific material consideration in the Planning Process and in the allocation and release of sites for development or re-development.

3.0.2 The NPPF expects the Local Planning Authority to adopt a risk-based approach at all levels of planning, through the application of the Sequential Test.

3.0.3 The aim of the sequential test is to steer new development to areas with the lowest probability of flooding. Development should not be allocated or permitted if there are reasonably available sites appropriate for the proposed development in areas with a lower probability of flooding.

3.0.4 The Strategic Flood Risk Assessment will provide the basis for applying this test. A sequential approach should be used in areas known to be at risk from any form of flooding.

3.1.0 REQUIREMENTS OF A FLOOD RISK ASSESSMENT

3.1.1 Paragraph 30 of the Planning Practice Guidance to the National Planning Policy Framework (PPG to the NPPF) states:

"A site-specific flood risk assessment is carried out by (or on behalf of) a developer to assess the flood risk to and from a development site. Where necessary (see footnote 20 in the National Planning Policy Framework), the assessment should accompany a planning application submitted to the local planning authority. The assessment should demonstrate to the decision-maker how flood risk will be managed now and over the development's lifetime, taking climate change into account, and with regard to the vulnerability of its users (see Table 2 – Flood Risk Vulnerability)."

3.1.2 Footnote 20 of the National Planning Policy Framework (NPPF) states:

"A site-specific flood risk assessment is required for proposals of 1 hectare or greater in Flood Zone 1; all proposals for new development (including minor development and change of use) in Flood Zones 2 and 3, or in an area within Flood Zone 1 which has critical drainage problems (as notified to the local planning authority by the Environment Agency); and where proposed development or a change of use to a more vulnerable class may be subject to other sources of flooding."

3.1.3 The objectives of a site-specific flood risk assessment are to establish:

- *"Whether a proposed development is likely to be affected by current or future flooding from any source;*
- *Whether it will increase flood risk elsewhere;*
- *Whether the measures proposed to deal with these effects and risks are appropriate;*
- *The evidence for the local planning authority to apply (if necessary) the Sequential Test, and;*
- *Whether the development will be safe and pass the Exception Test, if applicable."*

3.1.4 Paragraph 31of the PPG to the NPPF states:

"The information provided in the flood risk assessment should be credible and fit for purpose. Site-specific flood risk assessments should always be proportionate to the degree of flood risk and make optimum use of information already available, including information in a Strategic Flood Risk Assessment for the area, and the interactive flood risk maps available on the Environment Agency's web site.

A flood risk assessment should also be appropriate to the scale, nature and location of the development. For example, where the development is an extension to an existing house (for which planning permission is required) which would not significantly increase the number of people present in an area at risk of flooding, the local planning authority would generally need a less detailed assessment to be able to reach an informed decision on the planning application. For a new development comprising a greater number of houses in a similar location, or one where the flood risk is greater, the local planning authority would need a more detailed assessment."

3.1.5 Table 2 on the following page is a copy of Table 2: 'Flood Risk Vulnerability Classification' taken from of the PPG to the NPPF.

ESSENTIAL INFRASTRUCTURE
• Essential transport infrastructure (including mass evacuation routes) which has to cross the area at risk. • Essential utility infrastructure which has to be located in a flood risk area for operational reasons, including electricity generating power stations and grid and primary substations; and water treatment works that need to remain operational in times of flood. • Wind turbines.
HIGHLY VULNERABLE
• Police and ambulance stations; fire stations and command centres; telecommunications installations required to be operational during flooding. • Emergency dispersal points. • Basement dwellings. • Caravans, mobile homes, and park homes intended for permanent residential use. • Installations requiring hazardous substances consent.
MORE VULNERABLE
• Hospitals, residential institutions such as residential care homes, children's homes, social services homes, prisons and hostels. • Buildings used for dwelling houses, student halls of residence, drinking establishments, nightclubs and hotels. • Non–residential uses for health services, nurseries and educational establishments. • Landfill* and sites used for waste management facilities for hazardous waste. • Sites used for holiday or short-let caravans and camping, subject to a specific warning and evacuation plan.
LESS VULNERABLE
• Police, ambulance and fire stations which are not required to be operational during flooding. • Buildings used for shops; financial, professional and other services; restaurants, cafes and hot food takeaways; offices; general industry, storage and distribution; non-residential institutions not included in the 'More Vulnerable' class; and assembly and leisure. • Land and buildings used for agriculture and forestry. • Waste treatment (except landfill* and hazardous waste facilities). • Minerals working and processing (except for sand and gravel working). • Water treatment works which do not need to remain operational during times of flood. • Sewage treatment works, if adequate measures to control pollution and manage sewage during flooding events are in place.
WATER-COMPATIBLE DEVELOPMENT
• Flood control infrastructure. • Water transmission infrastructure and pumping stations. • Sewage transmission infrastructure and pumping stations. • Sand and gravel working. • Docks, marinas and wharves. • Navigation facilities. • Ministry of Defence installations. • Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location. • Water-based recreation (excluding sleeping accommodation). • Lifeguard and coastguard stations. • Amenity open space, nature conservation and biodiversity, outdoor sports and recreation and essential facilities such as changing rooms. • Essential ancillary sleeping or residential accommodation for staff required by uses in this category, subject to a specific warning and evacuation plan.

Table 2 – Flood Risk Vulnerability classification

3.1.6 With reference to Table 2, it is evident that the proposed development is classified as a 'More Vulnerable' development.

3.1.7 With reference to Table 3 below which is a copy of Table 3: 'Flood Risk Vulnerability and flood zone compatibility' taken from of the PPG to the NPPF. It is evident that the proposed 'More Vulnerable' development located entirely within Flood Zone must pass the Exception Test.

Flood Zones	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 *	×	×	×	✓

Table 3 – Flood Risk Vulnerability and flood zone compatibility

Key:

- ✓ Development is appropriate
- × Development should not be permitted

4.0.0 POTENTIAL SOURCES OF FLOOD RISK

4.0.1 Table 4 below identifies all of the potential sources of flood risk which may pose a flood risk to the site and the surrounding catchment.

4.0.2 Each source of flood risk is discussed in greater detail in the relevant section of this report and where necessary, appropriate flood risk mitigation measures may be recommended to minimise the likelihood and consequence of flooding and to facilitate a quicker recovery in the event of a flood.

Source of Flood Risk	Risk Potential					Justification
	High	Medium	Low	V. Low	None	
Fluvial – Main River	✓					The site is located within Flood Zone 3 and is susceptible to significant flooding in the event of a flood defence breach and/or overtopping.
Pluvial – Surface Water Runoff				✓		The site is considered to be at very low risk of pluvial flooding.
Reservoirs and Artificial Water Bodies					✓	The EA Risk of Flooding from Reservoirs Flood Maps confirm that in the event of breach the nearby reservoir or water bodies would not impact the proposed development.
Groundwater					✓	The site is not known to be susceptible to ground water flooding.
Tidal/Coastal Flooding					✓	The site is not susceptible to tidal or coastal flooding.

Table 4 – Sources of Flood Risk

4.1.0 FLUVIAL FLOOD RISK

4.1.1 Fluvial flooding occurs when the flows exceed the capacity of the channel, or where a restrictive structure is encountered, which leads to water overtopping the banks into the floodplain. This process can be exacerbated when debris is mobilised by high flows and accumulates at structures.

4.1.2 The Environment Agency Flood Maps for Planning refer to 'Flood Zones' which show the extent of the natural floodplain and ignores the presence of flood defences, manmade structures and channel improvements.

4.1.3 Table 5 details the Environment Agency Flood Map Descriptions:

Annotation	Description
Dark blue shading **(Flood Zone 3)**	**Flood Zone 3** comprises of two elements; **Flood Zone 3A** and **Flood Zone 3B** where: **Flood Zone 3A** shows the area of land that could be affected by flooding from rivers during a 1.0 per cent (1 in 100 year event) and from the sea during a 0.5 per cent (1 in 200 year event). **Flood Zone 3B** denotes the area of land where water has to flow or be stored in times of a flood. It is typically defined as an area of land that has a 5.0 percent (1 in 20 year) or greater chance of occurring each year.
Light blue shading	**Flood Zone 2** Shows the areas which are likely to be affected by a major flood, with up to a 0.1 per cent (1 in 1000 year) chance of occurring each year.
No blue shading	**Flood Zone 1** Shows the area of land where flooding from rivers and the sea is extremely unlikely and is defined as land having a less than 0.1 per cent (1 in 1,000 year) chance of occurring each year.
Dark blue line	**Main rivers** These are usually larger streams and rivers.
Purple Line (Flood Defences)	The **purple line** shows all flood defences built since 2010 with a standard of protection equal to or greater than 1.0 percent for rivers and 0.5 percent from the sea. Older defences or defences that provide a lower standard of protection may not be shown.
Hatched Areas	The hatched areas identify both the areas of land which are afforded protection from fluvial flooding up to and including the 1 per cent (1 in 100 year) chance of occurring each year, or flooding from the sea in a 0.5 per cent (1 in 200 year) chance of occurring each year.

Table 5 – Environment Agency Flood Map Description

4.1.4 Figures 1 sourced from the Environment Agency online Flood Map for Planning website[1] indicates that the site is located entirely within Flood Zone 3.



Figure 2 – EA Flood Map for Planning (Rivers and Sea)

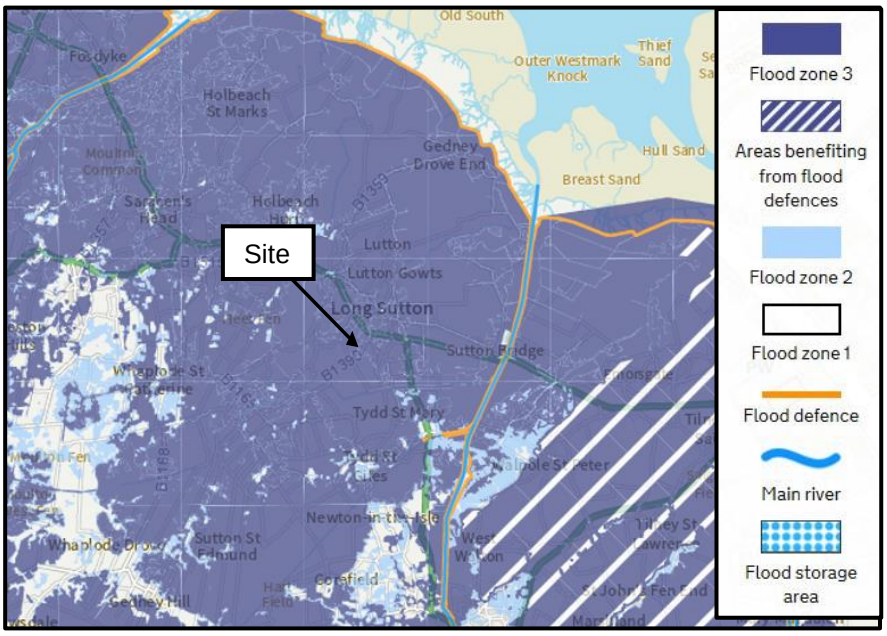


Figure 3 – EA Flood Map for Planning (Rivers and Sea)

[1] Environment Agency Flood Map for Planning http://maps.environment-agency.gov.uk

4.2.0 BREACH ASSESSMENT

4.2.1 The Breach hazard mapping showing the maximum; Hazard, Depth and Velocity was provided by the EA in June 2021 and is included as **Appendix 1**.

4.2.2 The Breach hazard mapping suggests that:

I. the site has a *"danger for some"* in both the 1 in 200 year and 1 in 1,000 year scenarios

II. the site may flood to a depth of between 0.00 and 0.25m in a 1 in 200 year flood defence breach scenario and between 0.25 to 0.50m in the 1 in 1,000 year flood defence breach scenario.

III. the maximum flood flow velocity at the site in the event of a flood defence breach during a 1% AEP breach event would be in the range of 0.00 m/s and 0.30 m/s

4.3.0 PLUVIAL FLOOD RISK

4.2.1 The EA website states:

"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."

4.2.2 Table 6 identifies the risk of surface water flooding throughout England as defined by the EA online Surface Water Flood Maps.

Scenario / Annotation	Description
High Risk – Dark blue shading	**High risk** means that each year this area has a chance of flooding of greater than 3.3%. 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.
Medium Risk – Blue shading	**Medium risk** means that each year this area has a chance of flooding of between 1% and 3.3%. 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.
Low Risk – Light blue shading	**Low risk** means that each year this area has a chance of flooding of between 0.1% and 1%. 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.
Very Low Risk – No shading	**Very low risk** means that each year this area has a chance of flooding of less than 0.1%. 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.

Table 6 – Surface Water Flood Risk descriptions

4.2.3 The Environment Agency Flood Risk from Surface Water Flood Maps (Figure 3) shows the site and surrounding catchment is at very low risk of pluvial flooding.

4.2.4 Very low risk means that each year this area has a chance of flooding of less than 0.1% and Low risk means that each year this area has a chance of flooding of between 0.1% and 1%.

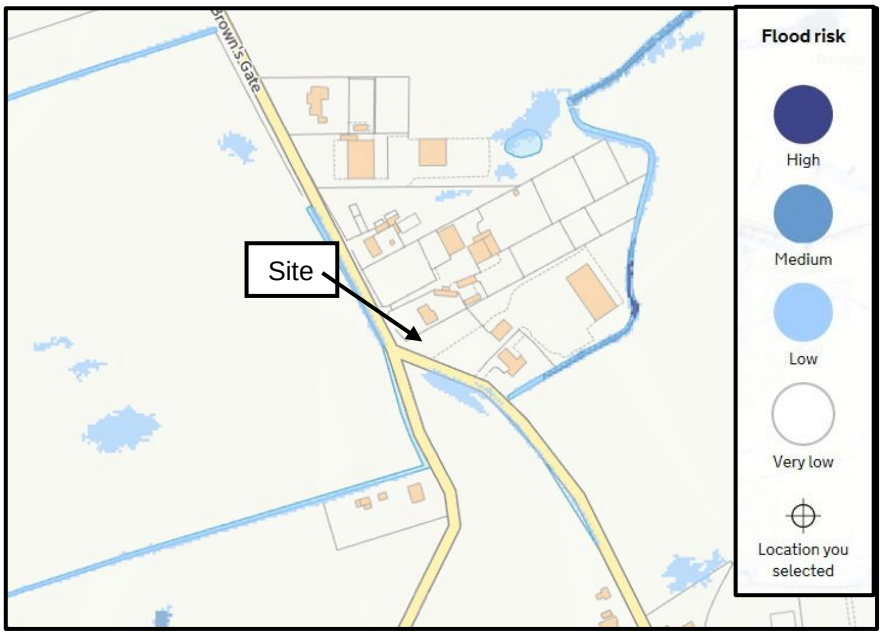


Figure 4 – EA Flood Risk from Surface Water Flood Maps

4.4.0 RESERVOIRS AND ARTIFICIAL WATER BODIES

4.3.1 With reference to the below online Environment Agency Risk of Flooding from Reservoirs Flood Maps, parts of the site may be susceptible to flooding in the extremely unlikely event of a reservoir embankment breach.



Figure 5 – EA Risk of Flooding from Reservoirs Flood Map

4.5.0 GROUNDWATER FLOOD RISK

4.4.1 The site is not known to be susceptible to ground water flooding.

4.4.2 The flood resilient measures recommended within this report will further reduce the likelihood and consequence of flooding and will facilitate a quicker recovery in the unlikely event of a flood.

5.0.0 DEVELOPMENT SPECIFICS

5.0.1 We understand and appreciate the reasonings why the EA principally look to avoid development with sleeping accommodation on the ground floor where the proposed development is located within Flood Zone 3, however, given that:

I. the applicant has two false knees, arthritis, and both the applicant and her husband's general health is deteriorating, our preference would be to provide sleeping accommodation as well as a bathroom on the ground floor so that they can be as self-sufficient as possible.

II. the applicant's son and his partner will provide additional caring for the applicant and her husband.

III. both the son and his partner live at Ringwood Lodge and therefore they are close to assist on a daily basis. Additional spare bedrooms will be required for visiting children which could be provided on the first floor.

5.0.2 Should the EA insist that sleeping accommodation on the ground floor must be prohibited then we wish to make it clear that the occupants of the site will be wholly reliant on the use of a stairlift to enable them to get to their bedrooms.

5.0.3 In the event of either a flood defence breach or an unprecedented extreme rainfall event, there is a high chance that the developments electrics will be compromised and therefore it is likely that the stairlift may not work during and immediately after a flood event.

5.0.4 If sleeping accommodation is not permitted on the ground floor and the stair lift becomes un-operational, the applicant's mobility issues may place an unnecessary burden on the already overstretched emergency services who may need to physically rescue the applicant and her husband from the first floor.

5.0.5 The Product 4 information indicates that the site may flood to a depth of between 0.00 and 0.25m in a 1 in 200 year flood defence breach scenario and between 0.25 to 0.50m in the 1 in 1,000 year flood defence breach scenario.

5.0.6 The FFL is proposed to be set 0.50m above the existing ground level which is at or above the anticipated 0.1% AEP modelled breach flood level. Additional flood resilience measures are to be incorporated throughout the design and construction of the proposed dwelling.

5.0.7 Whilst we fully understand and appreciate the reasoning for the EA's preference to avoid sleeping accommodation on the ground floor, we respectfully request that the EA permit sleeping accommodation of the ground floor in this instance for the reasons highlight above.

5.0.8 Should the EA insist that sleeping accommodation on the ground floor at this site must be prohibited, sleeping accommodation could be on first floor."

6.0.0 FLOOD RISK MITIGATION

6.0.1 The FFL's shall be set at least 0.5m above existing ground level.

6.0.2 Ground levels within the development should be profiled to encourage the runoff and overland flows to drain away from buildings and vulnerable infrastructure, and towards the nearest drainage point.

6.0.3 The proposed development will provide a first-floor refuge.

6.0.4 The occupants of the site should be made fully aware of the flood risks to the site and should acknowledge, understand and adhere the emergency evacuation procedures if safe.

6.0.5 The occupants of the site may wish to consider signing up to the Environment Agency Flood Line Warnings Direct via https://fwd.environment-agency.gov.uk/app/olr/register or by calling the Flood line on 0845 988 1188 to facilitate evacuation the event of an extreme flood event.

6.0.6 To further reduce the consequences of flooding and to facilitate a quicker recovery in the event of an extreme flood, it is recommended that the developer should consider implementing all appropriate flood resistant and resilient measures and should give due consideration to the reconditions of the Environment Agency and DEFRA report *'Improving the flood performance of New Buildings – Flood Resilient Construction' (ISBN 9781859462874)* including and not limited to:

EXTERNAL WORKS

- The dwellings should:
  - Be constructed using low permeability materials to a level equivalent to the proposed ground floor level plus at least 600mm.
  - Install non-return valves in all sewer pipes.
  - Avoid using timber frame and cavity walls with water absorbing fillers.
  - Raise airbricks as high as practical and consider installing airbrick covers
  - Consider incorporating temporary demountable flood gates/barriers.

INTERNAL WORKS

- The dwelling should:
  - Avoid the use of permeable materials gypsum, plaster and plaster boards etc. throughout the ground floor.
  - Where the use of plaster board cannot be avoided, it should be installed horizontally so that it can be replaced cost effectively if it is damaged.
- It is recommended that:
  - The ground floor is constructed from a solid concrete floor with integrated and continuous damp proof membrane and damp proof course.
  - The use of chipboard throughout the ground floor should be avoided

FIXTURES AND FITTINGS

It is recommended that:

- All kitchen units and appliances throughout the ground floor should be elevated as high as practical.
- All internal electrical sockets are raised as high as practical and least 300mm above the internal Finished Floor Level.
- Where possible all electrical sockets should wired down from the ceiling rather than up from the ground.

7.0.0 CONCLUSION

7.0.1 This FRA is fully compliant with the requirements set out in both the National Planning Policy Framework (NPPF) and the Planning Practice Guidance (PPG) to the NPPF.

7.0.2 This FRA has considered all source of flood risk and has demonstrated that:

- The proposed development will not increase the risk of flooding to others and will not adversely affect the local management of flood risk within the vicinity of the site.

- All measures so far as reasonably practicable to reduce flood risk to the occupants of the site have been considered and recommended within this FRA.

Paul Hands
paul-hands@hotmail.co.uk

Our ref: CCN-2021-218623

Date: 04 June 2021

Dear Paul

Provision of Flood Risk Information for Sutton Crosses, Spalding.

Thank you for your request to use our flood risk information for the above site. The information is set out below and attached. It is important you read any contextual notes on the maps provided.

If you are preparing a Flood Risk Assessment (FRA) for this site, please note this information may not be sufficient by itself to produce an adequate FRA to demonstrate the development is safe over its lifetime. Additional information may be required to carry out an appropriate assessment of all risk, such as consequence of a breach in defences.

We aim to review our information on a regular basis, so if you are using this data more than twelve months from the date of this letter, please contact us again to check it is still valid.

1. Flood Map

The attached map includes the current Flood Map for your area. The Flood Map indicates the area at risk of flooding, **assuming no flood defences exist**, for a flood with a 0.5% chance of occurring in any year for flooding from the sea, or a 1% chance of occurring for fluvial (river) flooding. It also shows the extent of the Extreme Flood Outline which represents the extent of a flood with a 0.1% chance of occurring in any year, or the highest recorded historic extent if greater.

In some locations, such as around the fens and the large coastal floodplains, showing the area at risk of flooding assuming no defences may give a slightly misleading picture in that if there were no flood defences, water would spread out across these large floodplains. This flooding could cover large areas of land but to relatively shallow depths and could leave pockets of locally slightly higher land as isolated dry islands. It is important to understand the actual risk of the flooding to these dry islands, particularly in the event of defence failure.

The Flood Map also shows the location of formal raised flood defences and flood storage reservoirs. It represents areas at risk of flooding for present day only and does not take account of climate change.

The Flood Map only indicates the extent and likelihood of flooding from rivers or the sea. It should also be remembered flooding may occur from other sources such as surface water sewers, road drainage, etc.

2. Historic Flood Event Outlines

With regards to the history of flooding I can advise we do not have any records of flooding in this area. It is possible recent flooding may have occurred which we are currently investigating, therefore this information may be subject to change. It is possible other flooding may have occurred which other risk management authorities, such as the Lead Local Flood Authority (ie top tier council) or Internal Drainage Board (where they exist) have responsibility.

3. Schemes in the area

There are no ongoing capital projects to reduce or sustain the current flood risk to this site.

4. Fluvial Flood Risk Information

This site is not considered to be at risk of flooding from main rivers.

The site may be at risk from local ordinary watercourses for which other risk management authorities, such as the Lead Local Flood Authority (ie top tier council) or Internal Drainage Board (where they exist) have responsibility.

5. Tidal Flood Risk Information

5.1 Tidal Defence Information

The existing tidal defences protecting this site consist of earth embankments. They are in good condition and reduce the risk of flooding (at the defence) to a 0.67% (1 in 150) chance of occurring in any year. We inspect these defences routinely to ensure potential defects are identified.

Refer to paragraph 3.1 for details of any ongoing capital projects to reduce the flood risk to this site.

5.2 Tidal Flood Levels

The attached data sheets show our current best estimate for extreme tide levels.

Please read the information notes on the data sheets.

5.3 Tidal Hazard Mapping

For certain locations we have carried out modelling to map the maximum values of flood depth, velocity and hazard rating (danger to people) resulting from overtopping and / or breaching of defences at specific locations for a number of scenarios.

At present this information is available along the full coastal / tidal floodplain, except the tidal Witham Haven in Boston (upstream of Hobhole) where only breaching and not overtopping has been modelled and the tidal River Welland upstream of Fosdyke Bridge where neither breaching nor overtopping are available.

The number of locations we have this information for is expected to increase in time.

The attached maps show the maximum values of flood depth, velocity and hazard rating (danger to people) resulting from breaching of the defences at specific locations for the scenarios below. For some locations the breach mapping also includes flooding from overtopping if this is expected in that scenario. The location of modelled tidal breaches is shown on a separate attached map.

5.3.1 Tidal Hazard Mapping - Breaches

- Year 2006 0.5% (1 in 200) chance
- Year 2006 0.1% (1 in 1000) chance
- Year 2115 0.5% (1 in 200) chance
- Year 2115 0.1% (1 in 1000) chance

Detailed Hazard Mapping is available within the 2017 Update of South Holland Strategic Flood Risk Assessment. This can be downloaded via the following link:
http://www.southeastlincslocalplan.org/south-east-lincolnshire-strategicfloodriskassessment-march-2017

5.3.2 Tidal Hazard Mapping - Overtopping

The attached maps show the maximum values of flood depth, velocity and hazard rating (danger to people) resulting from simulated overtopping of defences for the following scenarios:

Your site is not affected by overtopping of the defences for the present day (2006) and climate change (2115) scenarios

6. Development Planning

If you would like local guidance on preparing a flood risk assessment for a planning application, please contact our Sustainable Places team at lnplanning@environment-agency.gov.uk. It will help if you mention this data request and attach your site location plan.

We provide free preliminary advice; additional/detailed advice, review of draft FRAs and meetings are chargeable at a rate set to cover our costs, currently £100 (plus VAT) per hour of staff time. Further details are available on our website at https://www.gov.uk/guidance/developers-get-environmental-advice-on-your-planning-proposals.

General advice on flood risk assessment for planning applications can be found on GOV.UK at https://www.gov.uk/guidance/flood-risk-assessment-for-planning-applications

Climate change will increase flood risk due to overtopping of defences. Please note, unless specified otherwise, the climate change data included has an allowance for 20% increase in flow. Updated guidance on how climate change could affect flood risk to new development - 'Flood risk assessments: climate change allowances' was published on GOV.UK in February 2016. The appropriate updated climate change allowance should be applied in a Flood Risk Assessment.

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

7. Data Licence and Other Supporting Information

We respond to requests for recorded information we hold under the Freedom of Information Act 2000 (FOIA) and the associated Environmental Information Regulations 2004 (EIR).

This information is provided in accordance with the Open Government Licence which can be found here: http://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/

Further information on flood risk can be found on the GOV.UK website at: https://www.gov.uk/browse/environment-countryside/flooding-extreme-weather

8. Other Flood Risk Management Authorities

The information provided with this letter relates to flood risk from main river or the sea. Additional information may be available from other risk management authorities, such as the Lead Local Flood Authority (ie top tier council) or Internal Drainage Board (where they exist).

I hope we have correctly interpreted your request. If you have any queries or would like to discuss the content of this letter further please contact James Beckett using the email address below.

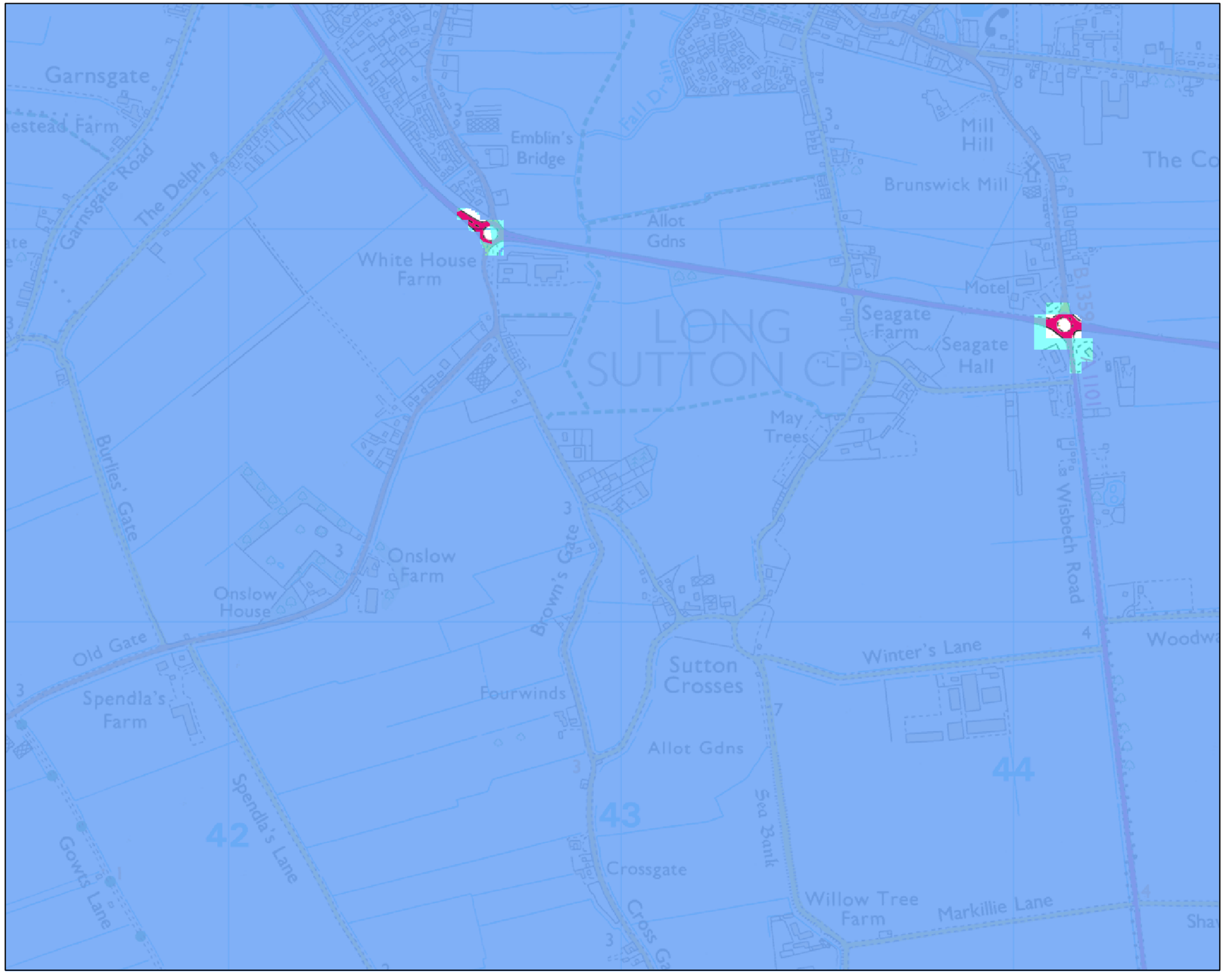
Yours sincerely,



for Alastair Windler
Welland and Nene Partnerships and Strategic Overview Team Leader
e-mail PSOWN@environment-agency.gov.uk

Enc.
Flood Map
Tidal Levels Map and Tables
Tidal Breach Points – Locations Map
Hazard Mapping – Breaching

Flood Map centred on TF 42980 21342 - created June 2021 [Ref: CCN-2021-218623]



Environment Agency

Scale 1:10,000

N

Legend

- Main River
- Raised Defences
- Flood Storage Areas
- Area at Risk of Flooding from Rivers or The Sea
- Extreme Flood Outline

Dark blue shows the area that could be affected by flooding, either from rivers or the sea, if there were no flood defences. This area could be flooded:

- from the sea by a flood that has a 0.5% (1 in 200) or greater chance of happening each year.

- or from a river by a flood that has a 1% (1 in 100) or greater chance of happening each year.

Light blue shows the extent of the Extreme Flood Outline, 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.

These two colours show the extent of the natural floodplain if there were no flood defences or certain other manmade structures and channel improvements. Sites outside the two extents, but behind raised defences, may be affected by flooding if the defences are overtopped or fail.

Created by the Partnerships and Strategic Overview Team, Kettering

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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

East Coast and Wash - 2018 Coastal Flood Boundary [CFB] Dataset
Key Node Points



Scale 1:550,000

N
W E
S

▲ East Coast and Wash

See seperate data sheet for predicted flood levels

Created by the Partnerships and Strategic Overview Team, Lincoln

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East Coast and Wash: Immingham to the West Lighthouse

2018 Coastal Flood Boundary Extreme Sea Levels

CFB Ref	Location	Easting	Northing	Annual Chance (1 in x) of Tide Level in metres ODN																		
				1			10			50			100			200			300			1000		
				Confidence Bound			Confidence Bound			Confidence Bound			Confidence Bound			Confidence Bound			Confidence Bound			Confidence Bound		
				2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%	2.5%	50%	97.5%
3888	**Immingham**	520440	417625	4.16	4.17	4.19	4.50	4.53	4.62	4.73	4.80	5.00	4.83	4.93	5.19	4.93	5.06	5.41	4.98	5.14	5.55	5.15	5.38	6.01
3890	**Haborough Marsh**	522100	416512	4.14	4.15	4.17	4.48	4.51	4.60	4.70	4.77	4.97	4.80	4.90	5.16	4.90	5.03	5.38	4.94	5.10	5.51	5.11	5.34	5.97
3898	**Grimsby**	529295	413162	3.98	3.99	4.01	4.31	4.34	4.43	4.53	4.60	4.80	4.61	4.71	4.97	4.71	4.84	5.19	4.74	4.90	5.31	4.88	5.11	5.74
3906	**Buck Beck**	534709	407369	3.87	3.88	3.90	4.19	4.23	4.31	4.41	4.50	4.68	4.50	4.61	4.86	4.61	4.75	5.10	4.64	4.82	5.22	4.80	5.05	5.66
3910	**Tetney**	538035	405537	3.85	3.86	3.89	4.17	4.22	4.30	4.40	4.50	4.67	4.49	4.61	4.86	4.60	4.75	5.10	4.63	4.82	5.21	4.80	5.06	5.66
3918	**Donna Nook**	544641	401997	3.82	3.83	3.86	4.14	4.19	4.27	4.38	4.48	4.65	4.47	4.60	4.85	4.58	4.74	5.10	4.63	4.82	5.22	4.81	5.08	5.68
3928	**Saltfleet**	549131	393360	3.78	3.79	3.82	4.11	4.16	4.26	4.36	4.46	4.64	4.47	4.59	4.86	4.57	4.74	5.11	4.63	4.83	5.25	4.83	5.11	5.74
3942	**Boygrift**	555131	380860	3.72	3.74	3.77	4.06	4.11	4.22	4.33	4.43	4.65	4.43	4.57	4.87	4.56	4.73	5.13	4.62	4.83	5.28	4.85	5.15	5.82
3968	**Gibraltar Point**	557652	356181	4.16	4.17	4.20	4.51	4.56	4.67	4.76	4.85	5.08	4.85	4.97	5.27	4.94	5.10	5.49	4.99	5.18	5.63	5.14	5.41	6.09
3992_14	**Hobhole**	535990	340116	4.96	4.97	5.01	5.40	5.44	5.56	5.66	5.76	5.98	5.78	5.90	6.20	5.88	6.04	6.44	5.92	6.11	6.57	6.03	6.31	6.99
	Grand Sluice*	532366	344510	4.93	4.94	4.98	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
3992_9	**Boston Barrier**	532754	342852	4.93	4.94	4.98	5.41	5.45	5.57	5.73	5.83	6.05	5.85	5.97	6.27	5.93	6.09	6.49	5.94	6.13	6.59	5.98	6.26	6.94
3992_5	**Fosdyke Bridge**	531886	332234	4.87	4.88	4.92	5.31	5.35	5.47	5.58	5.68	5.90	5.71	5.83	6.13	5.82	5.98	6.38	5.87	6.06	6.52	6.01	6.29	6.97
4008	**West Lighthouse**	550094	329971	4.87	4.88	4.91	5.21	5.26	5.37	5.46	5.56	5.78	5.56	5.68	5.98	5.66	5.82	6.21	5.71	5.90	6.35	5.86	6.14	6.81
-	**Marsh Road**	525988	324065	-	5.04	-	-	5.44	-	-	5.73	-	-	5.85	-	-	5.98	-	-	-	-	-	-	-
-	**Wisbech**	546110	309940	-	4.83	-	-	5.25	-	-	5.53	-	-	5.66	-	-	5.78	-	-	-	-	-	-	-
-	**Dog-in-a-Doublet**	527200	299287	-	3.67	-	-	4.00	-	-	4.22	-	-	4.32	-	-	4.42	-	-	-	-	-	-	-

See next page for notes

Customer services line: 03708 506 506
Calls to 03 numbers cost the same as calls to standard geographic numbers
(i.e. numbers beginning with 01 or 02)

Email: enquiries@environment-agency.gov.uk
www.gov.uk/environment-agency

East Coast and Wash: Immingham to the West Lighthouse

2018 Coastal Flood Boundary Extreme Sea Levels

NOTES:

The following notes apply to all CFB sites (ie all on table excluding Marsh Road, Wisbech, Dog-in-a-Doublet)

- The base date for the data is 2017.
- The levels are still water levels. Depending on the use of the data it may be necessary to consider wave heights and / or joint probability analysis of water level and other variables.
- Levels for other annual chance probabilities are available if required.
- For additional information relating to the 2018 Coastal Flood Boundary Extreme Sea Levels or to access the full dataset for the above sites or intermediate locations refer to the Defra Metadata Catalogue at https://deframetadata.com/geonetwork/srv/eng/catalog.search#/metadata/84a5c7c0-d465-11e4-b0bd-f0def148f590

The following notes apply to all Marsh Road, Wisbech, Dog-in-a-Doublet

- The base date for the data is 2006
- The levels are still water levels. Depending on the use of the data it may be necessary to consider wave heights and / or joint probability analysis of water level and other variables.
- Levels for other annual chance probabilities are available if required.
- These levels will be updated as their respective tidal river models are updated.

The following notes apply to Grand Sluice

- The data is based on CFB 2018 data for Boston Barrier site, capped at 5.3mAOD to reflect use of the barrier.
- The base date for the data is 2017
- The levels are still water levels. Depending on the use of the data it may be necessary to consider wave heights and / or joint probability analysis of water level and other variables.
- For additional information relating to the 2018 Coastal Flood Boundary Extreme Sea Levels or to access the full dataset for the above sites or intermediate locations refer to the Defra Metadata Catalogue at https://deframetadata.com/geonetwork/srv/eng/catalog.search#/metadata/84a5c7c0-d465-11e4-b0bd-f0def148f590

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www.gov.uk/environment-agency

^ **Modelled Breach Locations**

0 3.5 7 14 Kilometres

This map indicates the location of where we have modelled the consequence of breaches in the defences along the coastline and tidal rivers. We have mapped the the maximum values of Hazard Rating (Danger to People), Depth and Velocity.

We have not assumed that all breaches occur at the same time, but have modelled each breach individually and overlaid the results to find the maximum values.

Our modelling only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring. Our defences generally provide a good standard of flood defence but a risk of breaching remains.

Please contact the Environment Agency for information on how these maps are used in the management of flood risk.

General Enquiries No: 03708 506 506.
Weekday daytime calls cost 5p plus up to 6ppm from BT Weekend Unlimited. Mobile and other providers charges may vary

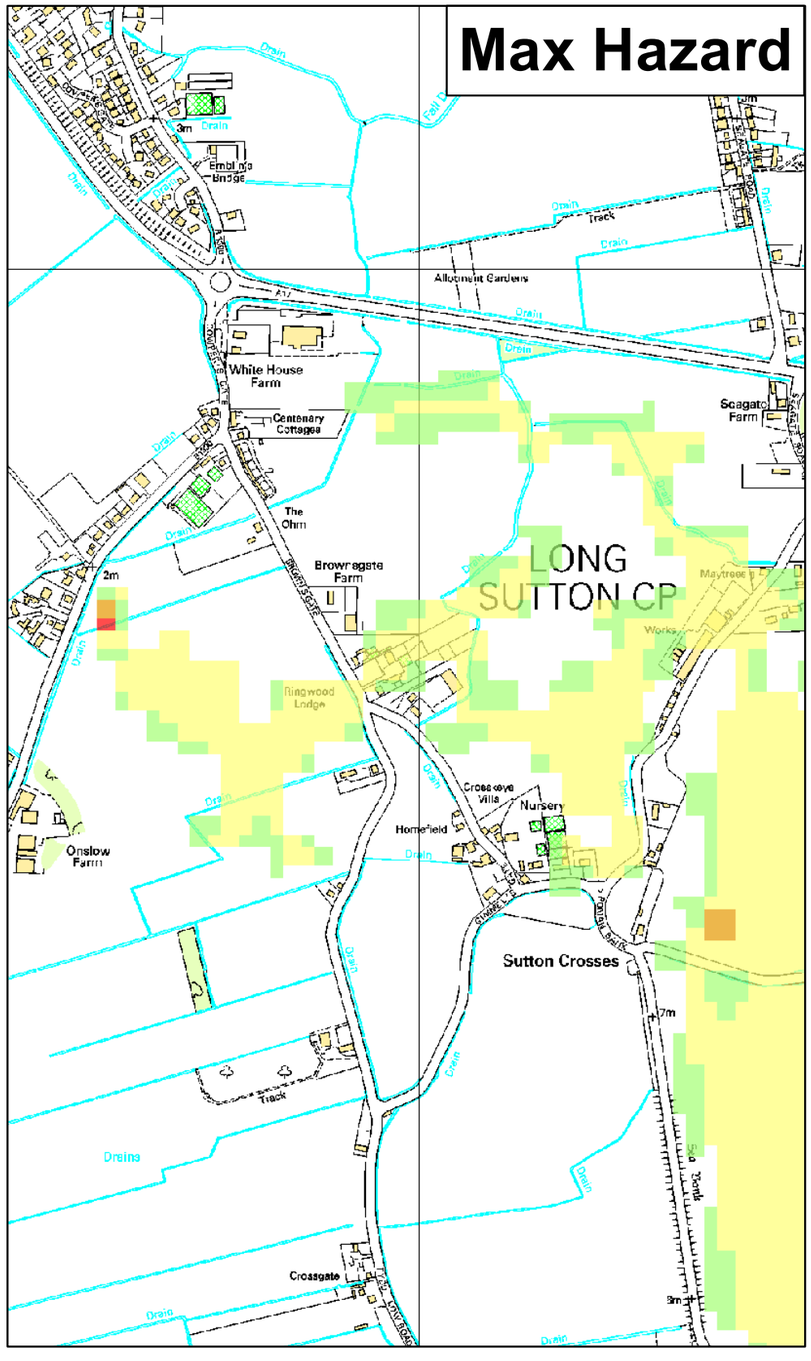
Environment Agency

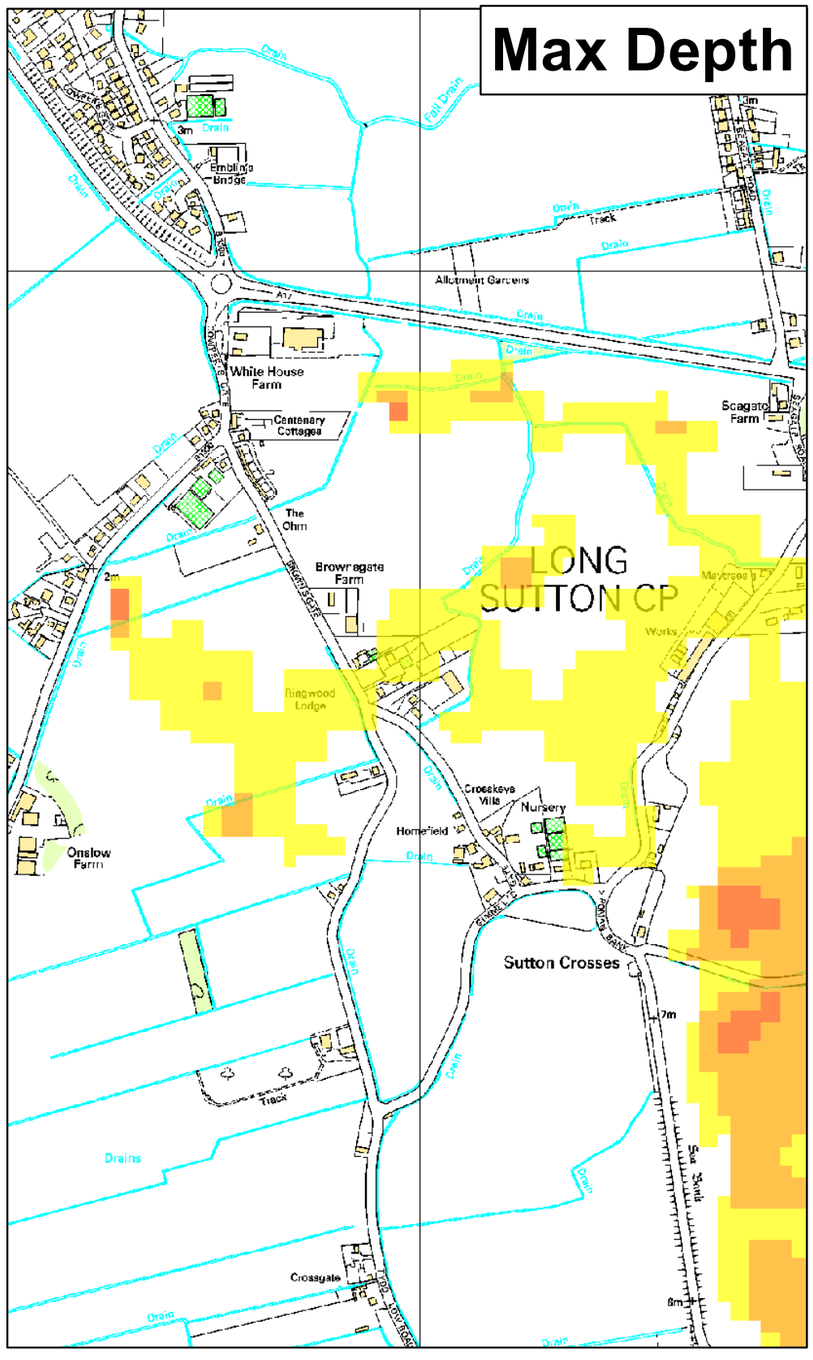
Produced by the Partnership and Strategic Overview Team, Lincoln
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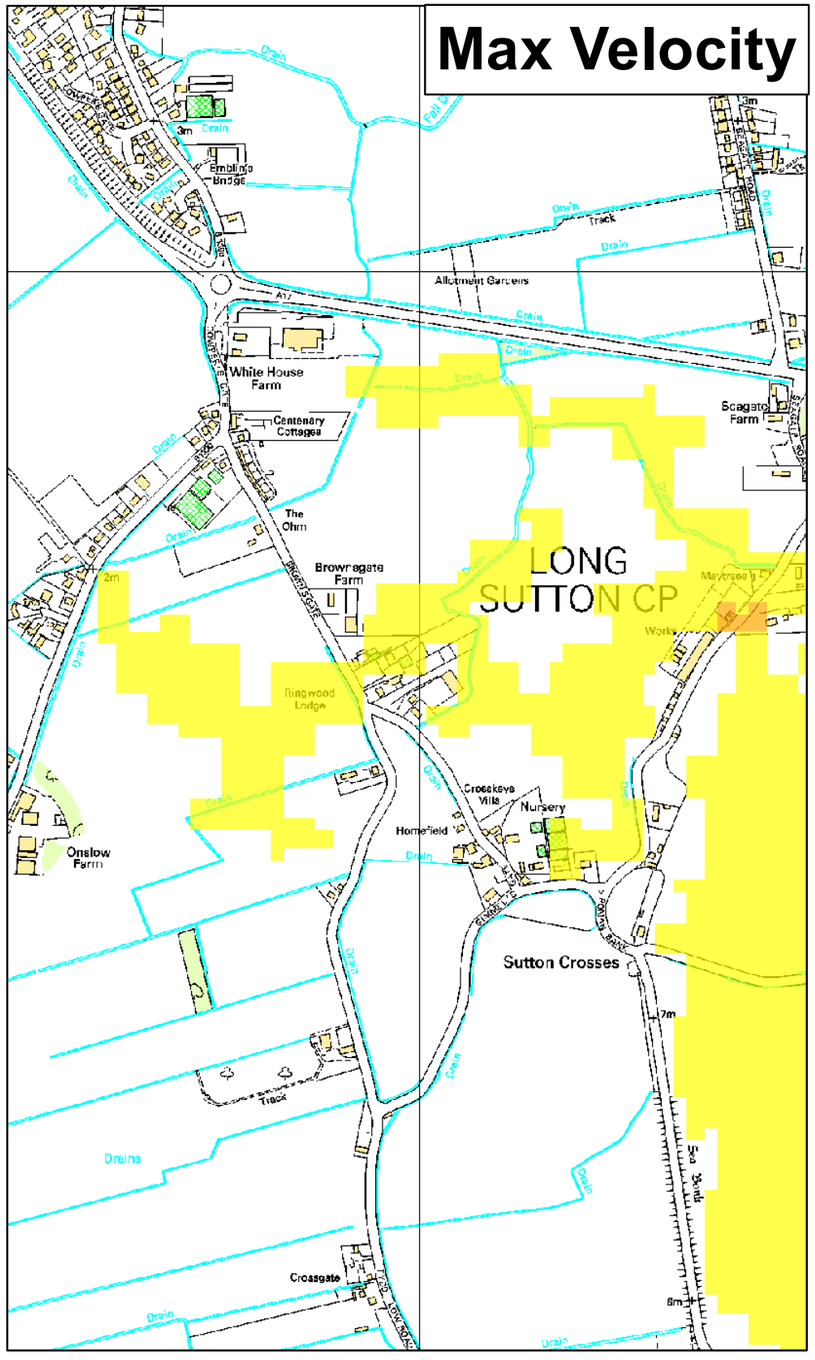
Northern Area Tidal Hazard Mapping

Location of Modelled Breaches

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★ Modelled Breach Locations - see also the accompanying plan "Location of Modelled Breaches"

Max Hazard
(Flood Risk to People : FD2320)

- Less than 0.75 (Low Hazard)
- Between 0.75 and 1.25 (Danger for Some)
- Between 1.25 and 2.0 (Danger for Most)
- Greater than 2.0 (Danger for All)

Max Depth (m)

- 0 - 0.25
- 0.25 - 0.50
- 0.50 - 1.0
- 1.0 - 1.6
- 1.6 +

Max Velocity (m/s)

- 0 - 0.3
- 0.3 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 +

Date Printed	June 2021	Scenario year	2006	Scenario Annual Chance	0.5% (1 in 200)	CCN Number	CCN-2021-218623

This map shows the level of flood hazard to people (called a hazard rating) if our flood defences are breached at certain locations, for a range of scenarios. The hazard rating depends on the depth and velocity of floodwater, and maximum values of these are also mapped.

The map is based on computer modelling of simulated breaches at specific locations. Each breach has been modelled individually and the results combined to create this map. Multiple breaches, other combinations of breaches, different sized tidal surges or flood flows may all give different results.

The map only considers the consequences of a breach, it does not make any assumption about the likelihood of a breach occurring. The likelihood of a breach occurring will depend on a number of different factors, including the construction and condition of the defences in the area. A breach is less likely where defences are of a good standard, but a risk of breaching remains.

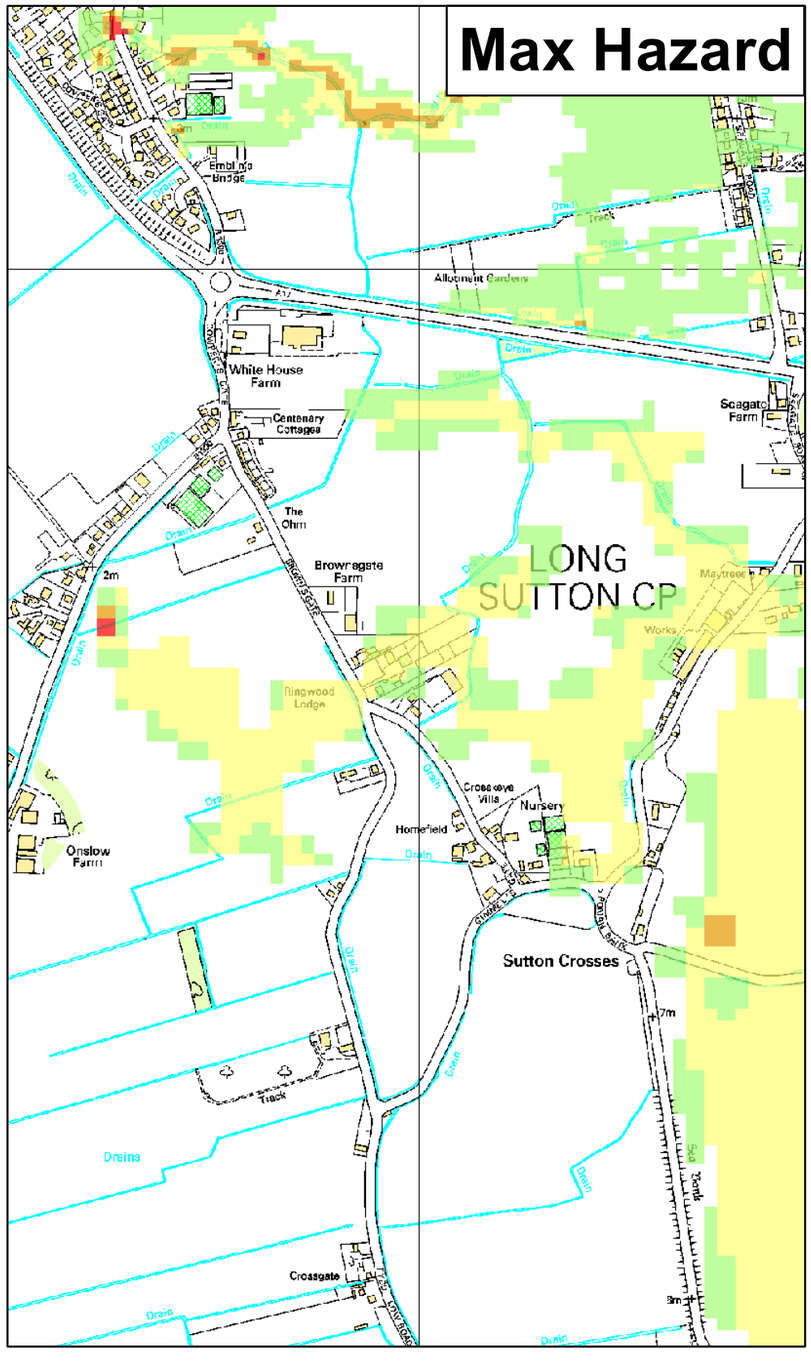
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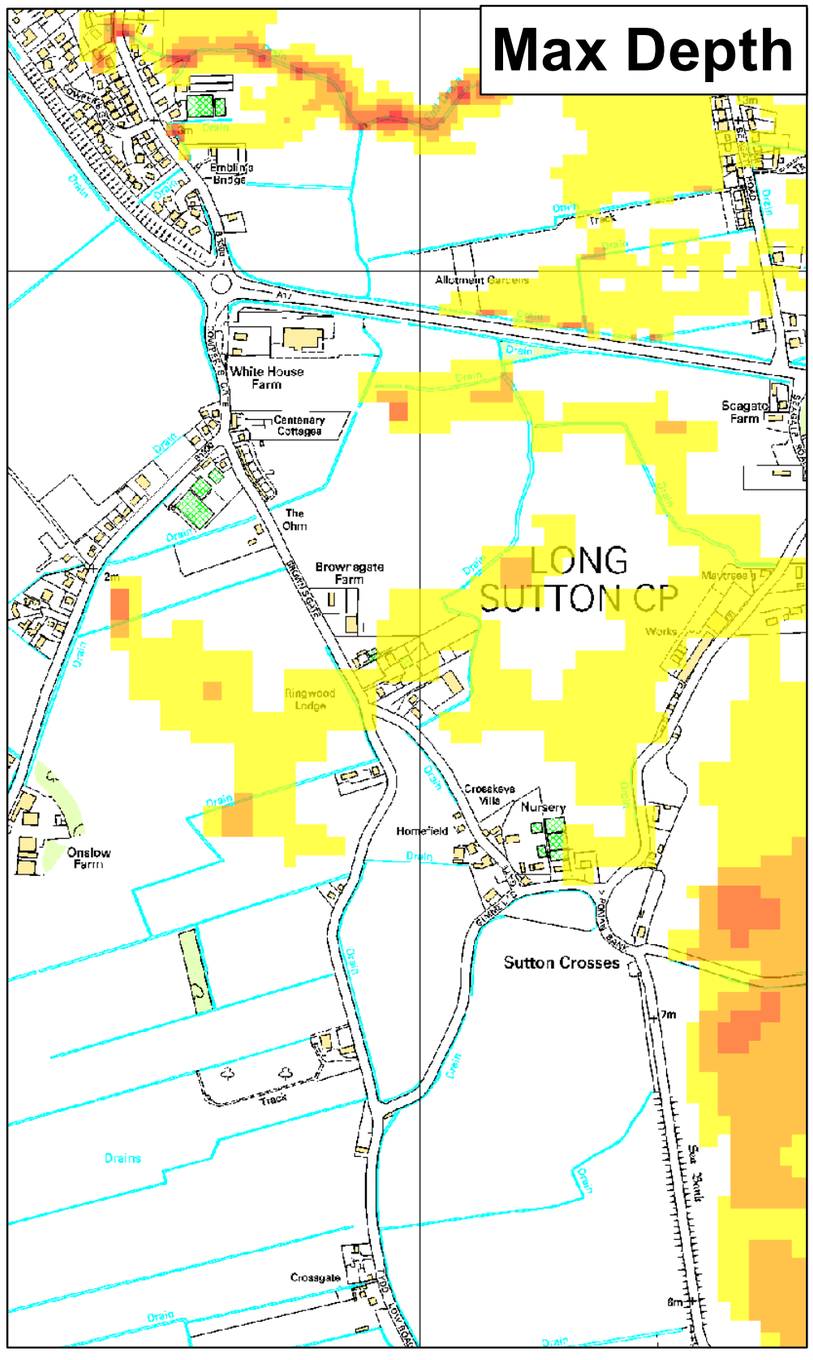
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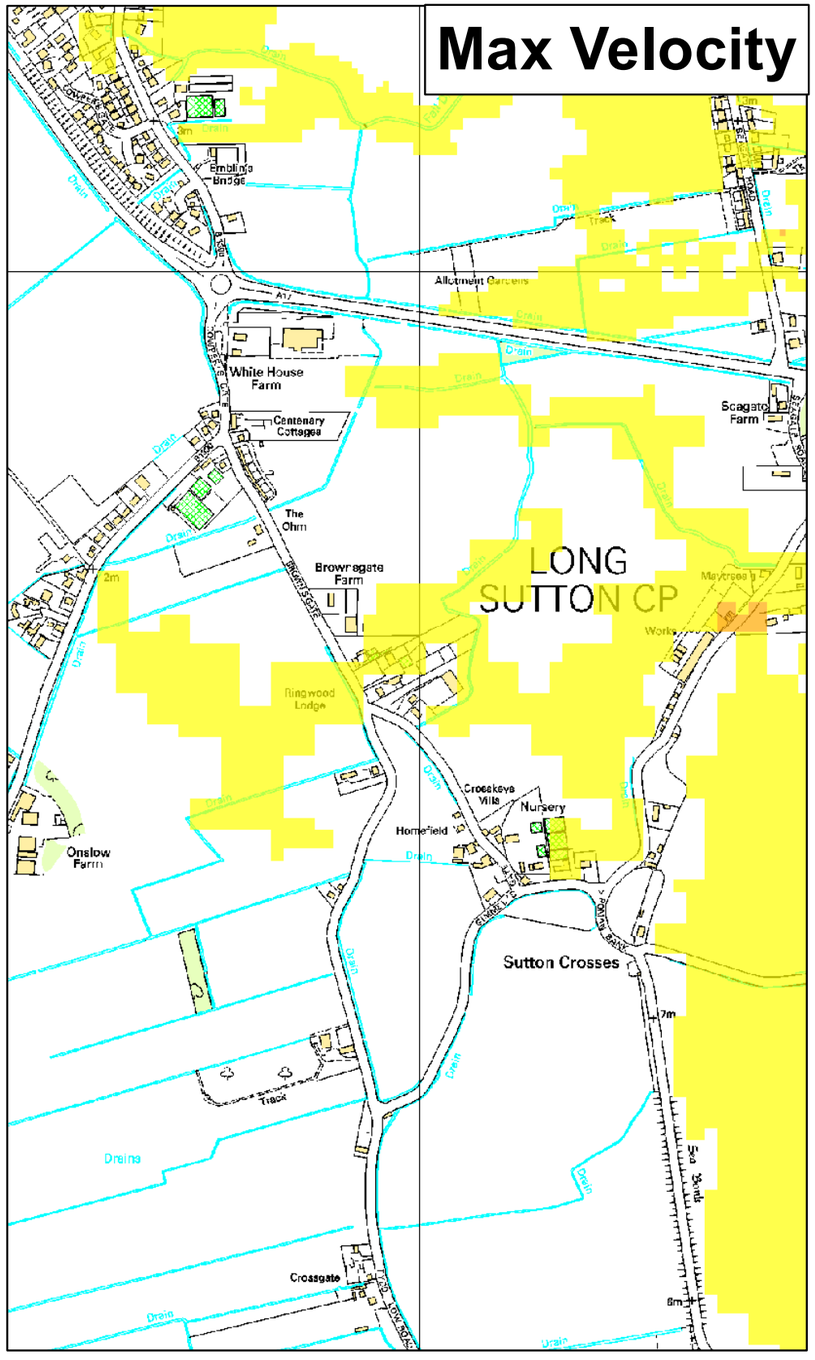
Lincolnshire and Northamptonshire Tidal Breaching Hazard Mapping

Map Centred on TF 42980 21342

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★ Modelled Breach Locations - see also the accompanying plan "Location of Modelled Breaches"

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(Flood Risk to People : FD2320)

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- Between 0.75 and 1.25 (Danger for Some)
- Between 1.25 and 2.0 (Danger for Most)
- Greater than 2.0 (Danger for All)

Max Depth (m)

- 0 - 0.25
- 0.25 - 0.50
- 0.50 - 1.0
- 1.0 - 1.6
- 1.6 +

Max Velocity (m/s)

- 0 - 0.3
- 0.3 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 +

Date Printed	June 2021	Scenario year	2006	Scenario Annual Chance	0.1% (1 in 1000)	CCN Number	CCN-2021-218623

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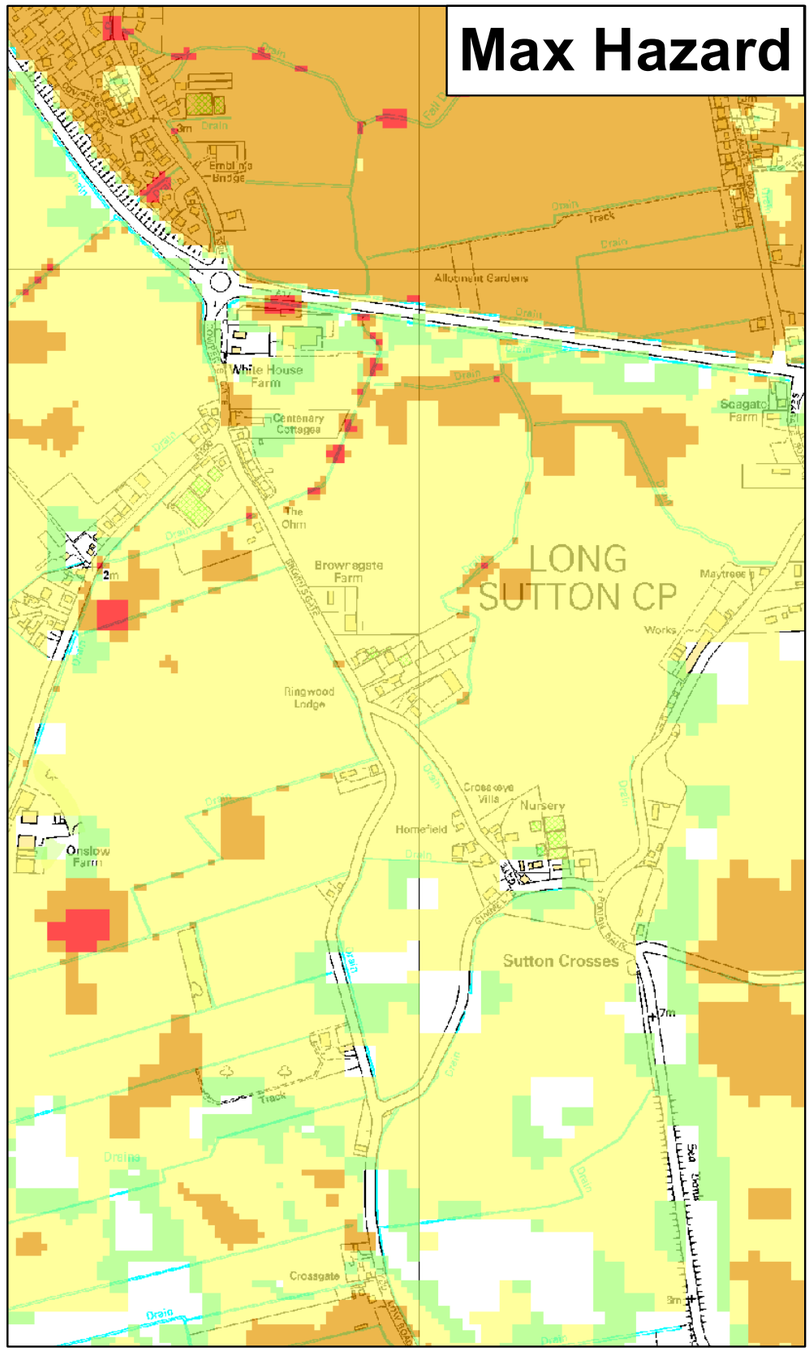
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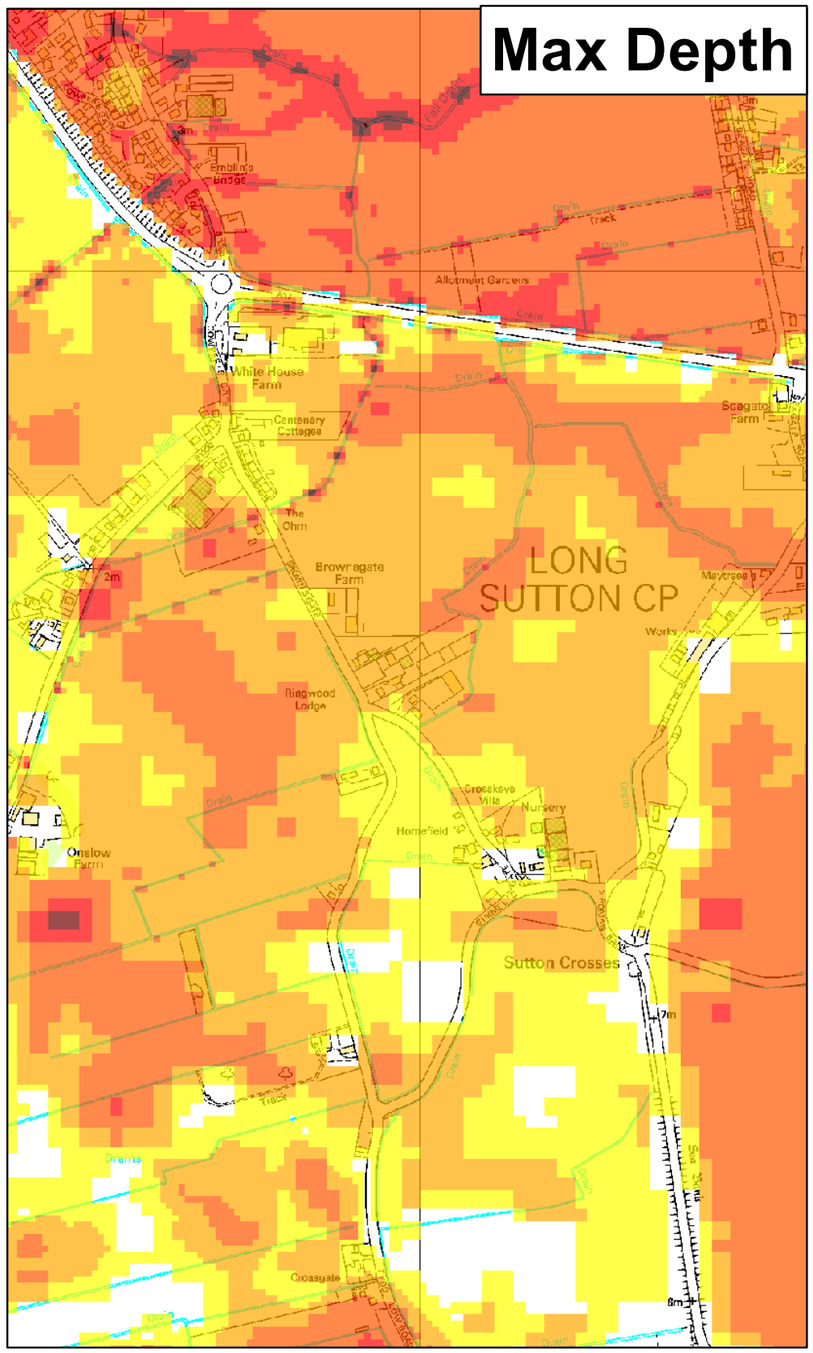
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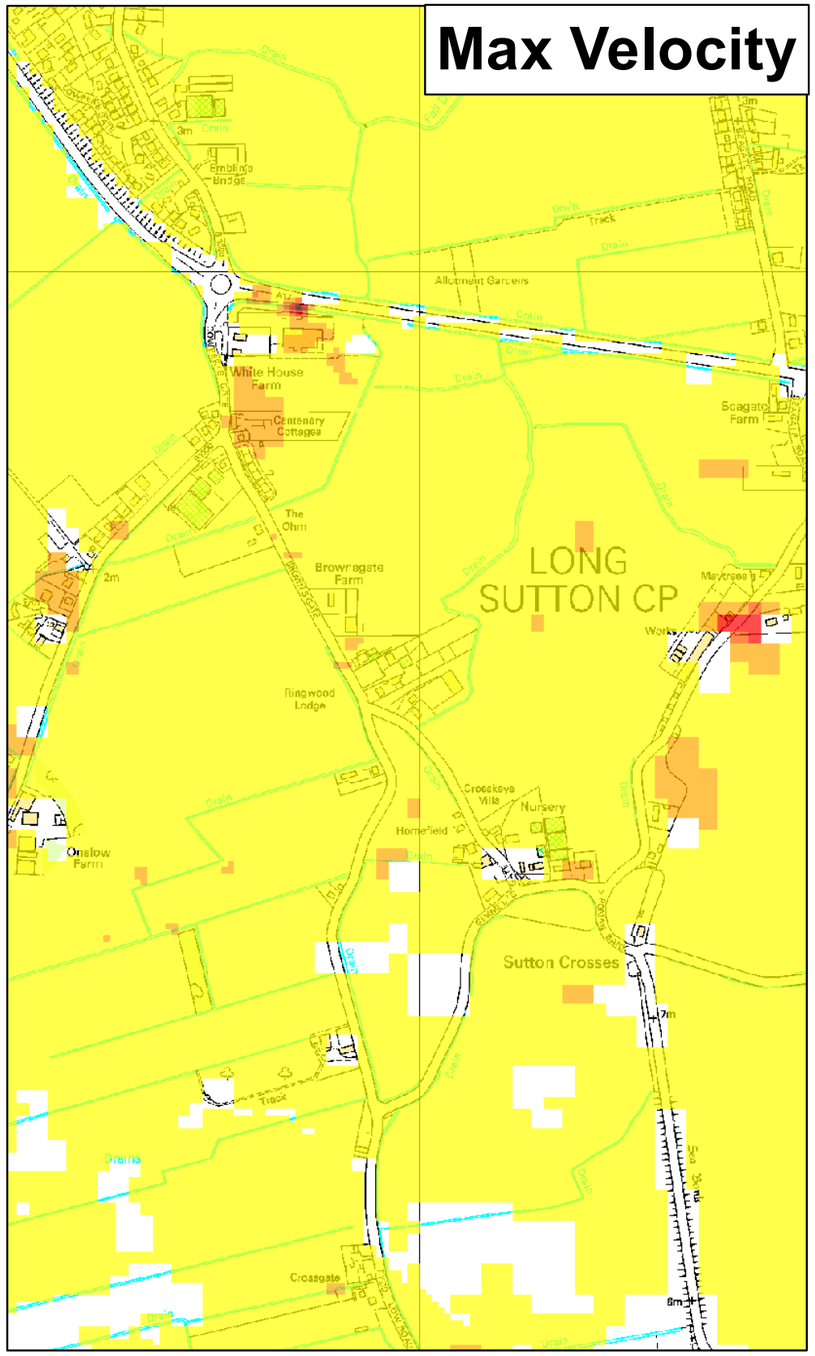
Lincolnshire and Northamptonshire Tidal Breaching Hazard Mapping

Map Centred on TF 42980 21342

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- 1.0 - 1.6
- 1.6 +

Max Velocity (m/s)

- 0 - 0.3
- 0.3 - 1.0
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Date Printed	June 2021	Scenario year	2115	Scenario Annual Chance	0.5% (1 in 200)	CCN Number	CCN-2021-218623

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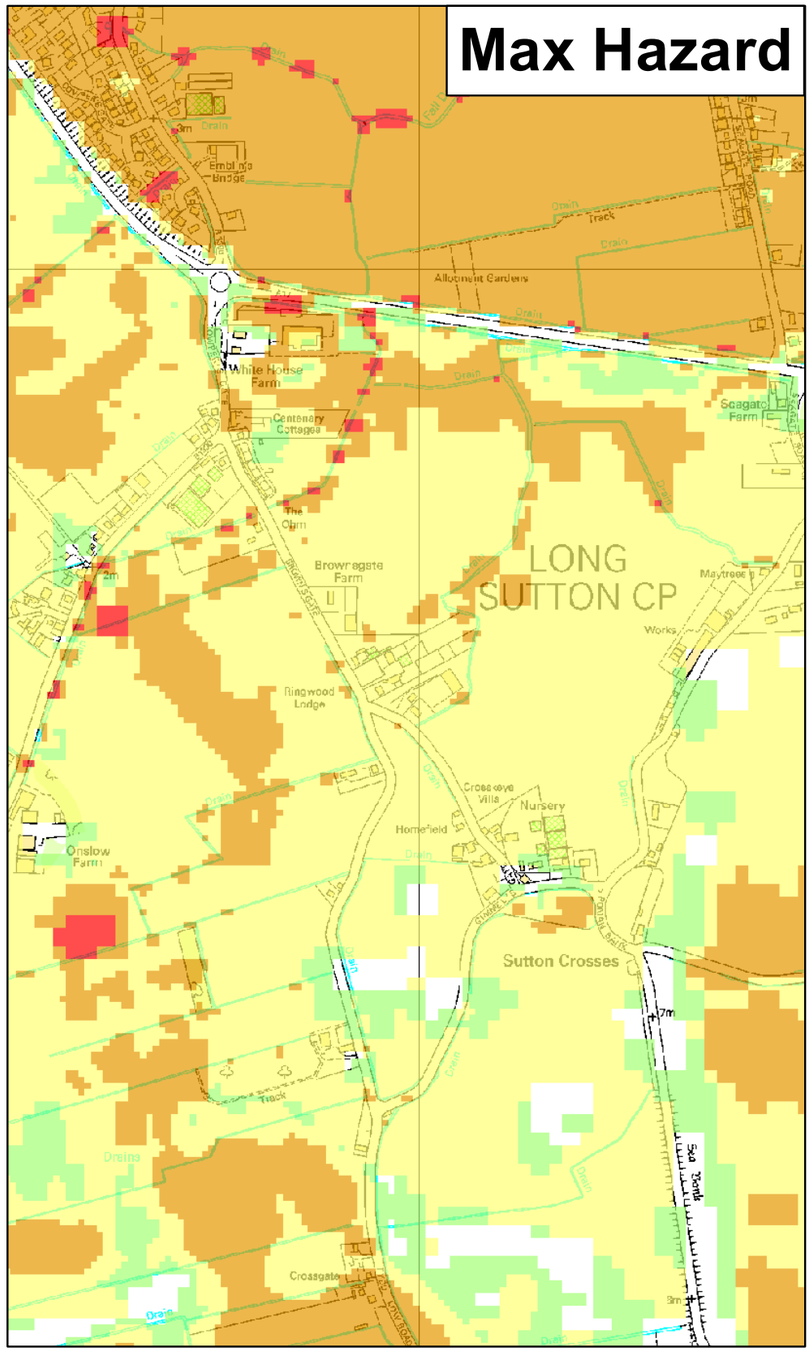
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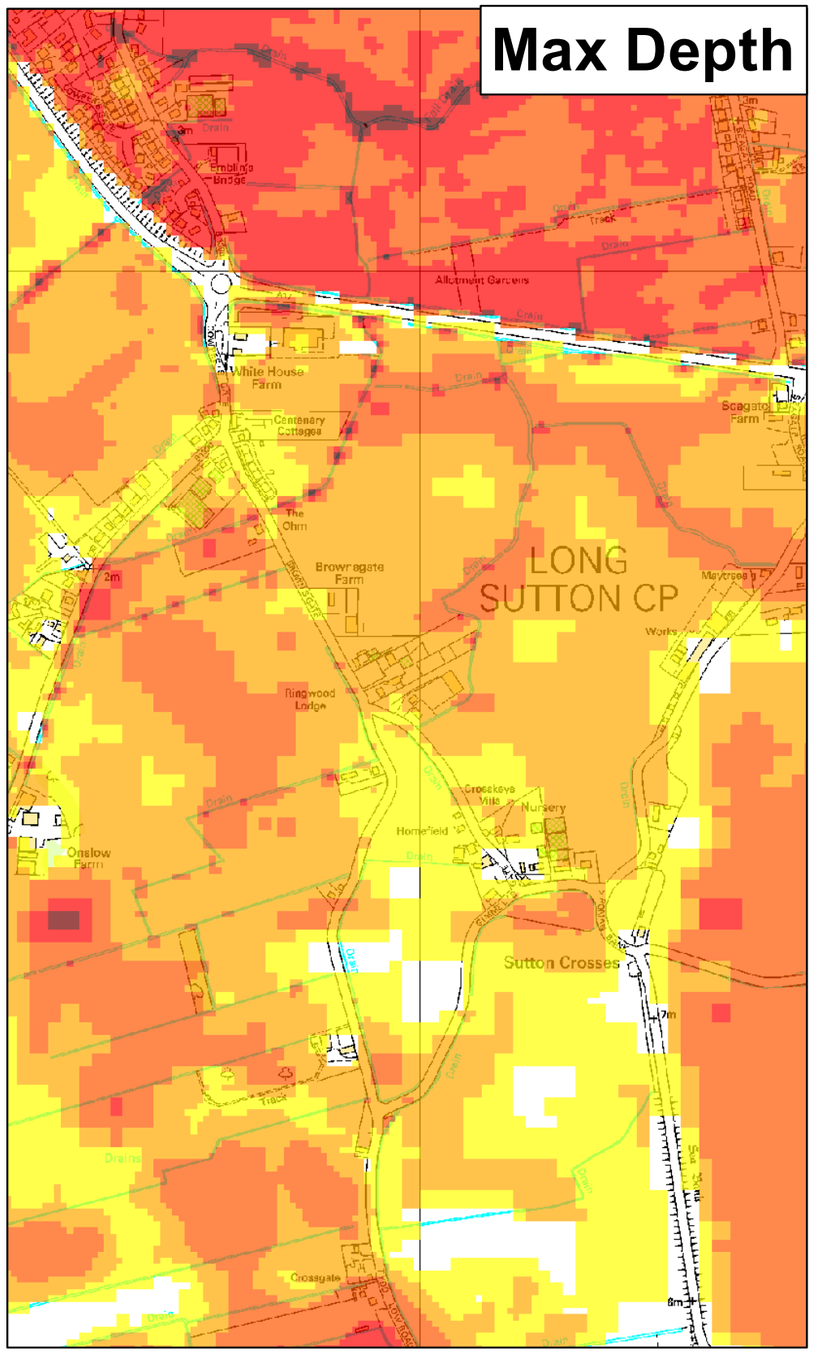
Environment Agency

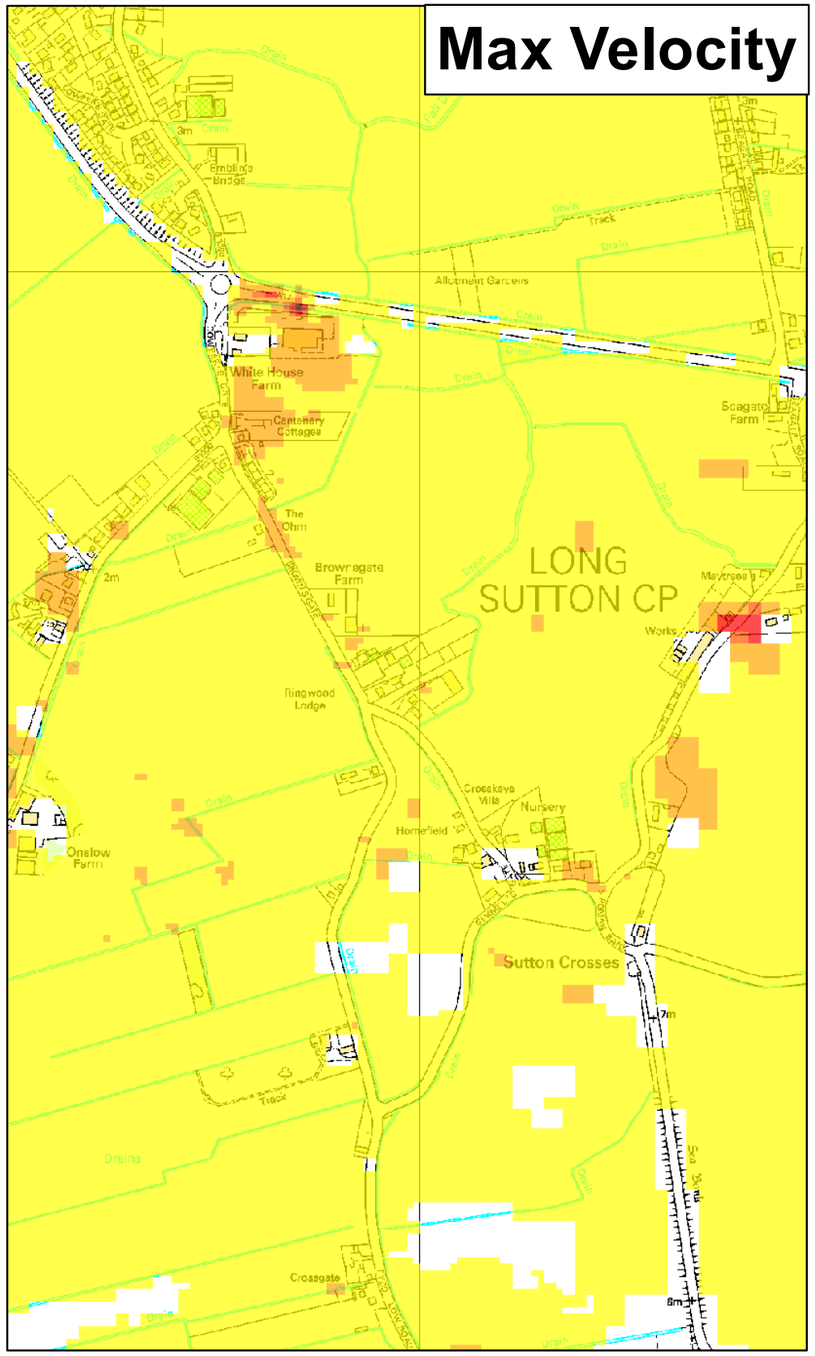
Lincolnshire and Northamptonshire Tidal Breaching Hazard Mapping

Map Centred on TF 42980 21342

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- 1.0 - 1.6
- 1.6 +

Max Velocity (m/s)

- 0 - 0.3
- 0.3 - 1.0
- 1.0 - 1.5
- 1.5 - 2.5
- 2.5 +

Date Printed	June 2021	Scenario year	2115	Scenario Annual Chance	0.1% (1 in 1000)	CCN Number	CCN-2021-218623

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Environment Agency

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