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Dear Planning

**RESIDENTIAL DEVELOPMENT (OUTLINE)
PIPWELL GATE, SARACENS HEAD
MR M AYRES**

With reference to the above and your invalid application letter sent to us on the 21st June, please find attached Flood Risk Assessment as requested.

We hope this now enables you to formally acknowledge the application.

Regards
Hannah

*G R Merchant Ltd
01406 490800*

**FLOOD RISK ASSESSMENT
FOR PROPOSED
RESIDENTIAL DEVELOPMENT AT
PIPWELL GATE, SARACENS HEAD, LINCS.**

FINAL REPORT

GEOFF BEEL CONSULTANCY

JULY 2016

GCB/MERCHANT

DISCLAIMER

This document has been prepared solely as a Flood Risk Assessment in support of a planning application for proposed Residential Development at Pipwell Gate, Saracens Head, Spalding, Lincolnshire. "Geoff Beel Consultancy" accepts no responsibility or liability whatsoever for any use made of this document other than by the client "Mr M Ayres" for the purposes it was originally commissioned and prepared. All comments and opinions made are based upon information available to "Geoff Beel Consultancy" during the necessary investigative process, and the conclusions and recommendations could therefore, differ in the event of material subsequently being found erroneous, incomplete or misleading. "Geoff Beel Consultancy" therefore, accepts no liability should this prove to be the case.

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1.0 INTRODUCTION

- 1.1 An outline planning application is to be submitted by G R Merchant Ltd on behalf of Mr M Ayres for proposed residential development at Pipwell Gate, Saracens Head, Spalding, Lincs.
- 1.2 A Flood Risk Assessment is required to accompany the planning application and meet the requirements and general principles contained in the Planning Practice Guidance to the National Planning Policy Framework (NPPF).

The site, as situated, is located within Flood Zone 3, of the Environment Agency's Flood Zone Maps. The latest Agency Flood Maps have been created as a tool to raise awareness of flood risk with the public and our partner organisations, such as Local Authorities, Emergency Services and Drainage Authorities. The Maps do not take into account any flood defences.

The site however is also shown in Flood Zone 1 and outside of any Hazard Zone in year 2115 of the South Holland District Council's Strategic Flood Risk Assessment Maps (2010).

The site is also located in the South Holland IDB drainage district.

- 1.3 Geoff Beel Consultancy was appointed on 21st June 2016 to undertake a Flood Risk Assessment.

2.0 LOCATION

- 2.1 The development site is located at Pipwell Gate, Saracens Head, Spalding. The National Grid Reference of the central point of the development is TF 33702725.
- 2.2 The position and extent of the site is shown on Fig 1 - Location and Site Layout Plans - Existing at the end of the document.
- 2.3 The site, located within the South Holland Internal Drainage Board district is shown within Flood Zone 3 as detailed on the Environment Agency Flood Zone Maps and in Flood Zone 1 of the Council's Strategic Flood Risk Assessment Maps (2010) as defended by the Agency's tidal defences and the Internal Drainage Board system in year 2115.

3.0 THE SITE AND SEQUENTIAL TEST

- 3.1 The site is currently agricultural land.
- 3.2 The area of development is approximately 0.39 hectare.
- 3.3 The proposed site layout consists the construction of 4 two-storey dwellings off Pipwell Gate. Land levels are generally at 3.80m aOD.
- 3.4 The Sequential Test and Exception Test will require to be applied by the Local Planning Authority but the development may be permitted as the site is protected against both the 1 in 200 year return period tidal event and the 1 in 100 year return period fluvial event and located in Flood Zone 1 in year 2115 of the Council's Strategic Flood Risk Assessment Maps (2010).

4.0 EXISTING FLOOD ALLEVIATION MEASURES

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

The development site within the South Holland Internal Drainage Board is protected by the Wash tidal defences to the Holbeach Marsh frontage with embankment levels of a minimum of 7.00m aOD.

- 4.2 The site and the surrounding land drains by gravity to Board main drains east of the site and hence to the Holbeach River Tidal Sluice the River Welland.
- 4.3 The existing standard of drainage for the South Holland Internal Drainage Board is 1 in 50 years return period, compatible with the Department of the Environment, Food and Rural Affairs target level of service for rural drainage and flood defence works. Freeboard of 900mm is provided to the lowest land levels.
- 4.4 Current maintenance standards within the South Holland Internal Drainage Board and of the Environment Agency defences are generally very good.

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

5.0 POTENTIAL SOURCES OF FLOODING

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

- a) local blockages to IDB main drain system.
- b) storm return period of 1 in 50 years being exceeded
- c) overtopping and breaching of defences of the Wash tidal defences

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

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

Previous historic rainfall events of 1968 and 1978, estimated to be greater than 1 in 100 year events, caused no flooding to any residential properties at the time and the Boards policy is to provide a standard of drainage which satisfies PPS25 requirements of a 1 in 100 year return period for fluvial protection inclusive of the effects of climate change and developments to the arterial system enables a flexible approach to be adopted and meet the criteria for "sustainable urban drainage".

5.3 The flood embankments to the Wash tidal defences provide a 1 in 200 year return period level of protection.

The 1 in 200 year tidal event to the Holbeach Marsh frontage inclusive of climate change to 2115 is estimated to be 7.20m aOD as against existing embankment levels of a minimum of 7.00m aOD.

There is a low risk during such an event for wave and wind action to cause overtopping and/or breaching of the first line defences. However, the site is further protected by second line defences with embankment levels of 6.00m aOD. Any overtopping/breaching would therefore not reach the development site which is again further protected by existing land levels at 3.80m aOD.

5.4 More recent Tidal Hazard Mapping produced by the Environment Agency in Fig 5 of this assessment shows the site to be free of any floodwaters as a result of a breach to the tidal defences in year 2115.

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

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

- 5.6 Surface water drainage from the residential development will be to soakaways designed to BRE365 requirements and Building Regulations approval.

6.0 EXTENT OF KNOWN FLOODING

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

7.0 PROBABILITIES AND TRENDS OF FLOODING

- 7.1 The probability of this development flooding from localised drainage systems is very low.
- 7.2 The probability of the site flooding with water from any South Holland IDB main drain is less than 1% because of the standards of the existing flood defence systems, storage within existing drainage channels and the location of the site.
- 7.3 The probability of the site flooding with tidal waters from any main river system is less than 1% because of the standards of the existing flood defences and the location of the site.
- 7.4 If under very extreme events, levels of floodwater from the South Holland IDB main drains or arterial systems rose to such an extent that the site was affected, the situation would not be sudden. It is very probable that sufficient time would be available to take precautionary actions to limit the extent and potential impact of flooding.
- 7.5 The water levels in the drainage channels will tend to rise as a result of the impacts of climate change. However the existing systems and defences together with the proposed residential floor levels at 300mm above Pipwell Gate road level will be appropriate for the design life of the development (i.e. 100 years).

8.0 IMPACTS OF FLOODING

- 8.1 No significant impacts of flooding are anticipated.
- 8.2 Floor levels of the residential development will be 300mm above Pipwell Gate road levels which together with the soakaway drainage will offer additional protection against impacts arising from any extreme short duration, localised events.
- 8.3 The general location of the site within the catchment is such that if flooding occurred from any of the South Holland IDB main drain systems, then probably 2 to 3 days warning time would be available.
- 8.4 No displacement of water from the site will affect any adjoining properties as the soakaway drainage will meet the requirements of a 1 in 100 year return period storm event.
- 8.5 Safe and dry access/egress is available to and from the site onto Pipwell Gate and hence in a southerly direction to Holbeach town centre in Flood Zone 1.

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

In addition to direct and indirect flood warnings, the Environment Agency operates a 24 hour a day Floodline Service providing advice and information on flooding, contact tel no: 0845 988 1188.

9.0 RESIDUAL RISK – EXTREME EVENTS

- 9.1 The residual risk from extreme events is very low on this site, because of its location, within the South Holland IDB area and its location 5.50kms from The Wash tidal defences with secondary defences between the marsh frontage and the site.
- 9.2 The site is in Flood Zone 1 according to NPPF classification, the site actually has a very low risk of flooding due to the current standards of drainage and flood defence and land levels. The site is not located within a Functional Flood Plain of any 'main river' or 'main drain'. The Environment Agency Flood Zone Maps have been produced irrespective of existing flood defences and standards of protection.
- 9.3 South Holland District Council in conjunction with the Environment Agency and the local IDB's within the Council area have carried out a Strategic Flood Risk Assessment (2010) of the whole District by appointed Consulting Engineers.

The Strategic Flood Risk Assessment (2010) has produced more definitive Flood Risk Maps than those published by the Environment Agency and at the same time has analysed flood return periods of all tidal and fluvial defences to account for the effects of climate change.

Breach scenarios of embankments failing and/or being overtopped have also been carried out to establish Flood Risk Zones. As a result of the Strategic Flood Risk Assessment (2010) the site is outside any Hazard Zone and defended by tidal defences and tidal doors inclusive of climate change up to 2115.

10.0 CONCLUSIONS AND RECOMMENDATIONS

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

- The proposed development is in a Defended Floodplain. It is located in the Passive Floodplain protected by defences to a 1 in 200 year return period, (1.0%)
- The site is in Flood Zone 1 with the actual risk of site flooding from any Environment Agency river system being very low (less than 0.5%).
- Although the site is located within an Internal Drainage District with a minimum standard of drainage of 1 in 50 years, this accords with Defra guidelines for rural development. Freeboard to design water level of 900mm to lowest land level is available for events greater than 1 in 50 years providing further storage within the drainage channels.
- On site rainwater from the development impermeable area will be discharged to soakaway drainage to BRE365 design requirements with Building Regulations approval.
- Residential floor levels of the development will be 300mm above adjoining Pipwell Gate road levels.



Enter a postcode or place name:

Other topics for this area...

Flood Map for Planning (Rivers and Sea)

Nottingham, Lincolnshire

Flood Map for Planning (Rivers and Sea)

X: 534.383 Y: 327.087 Z: 120.000

Map legend

Click on the map to see what Flood Zone (National Planning Policy Guidance definitions) the proposed development is in.

- ✓ Flood Map for Planning (Rivers and Sea)

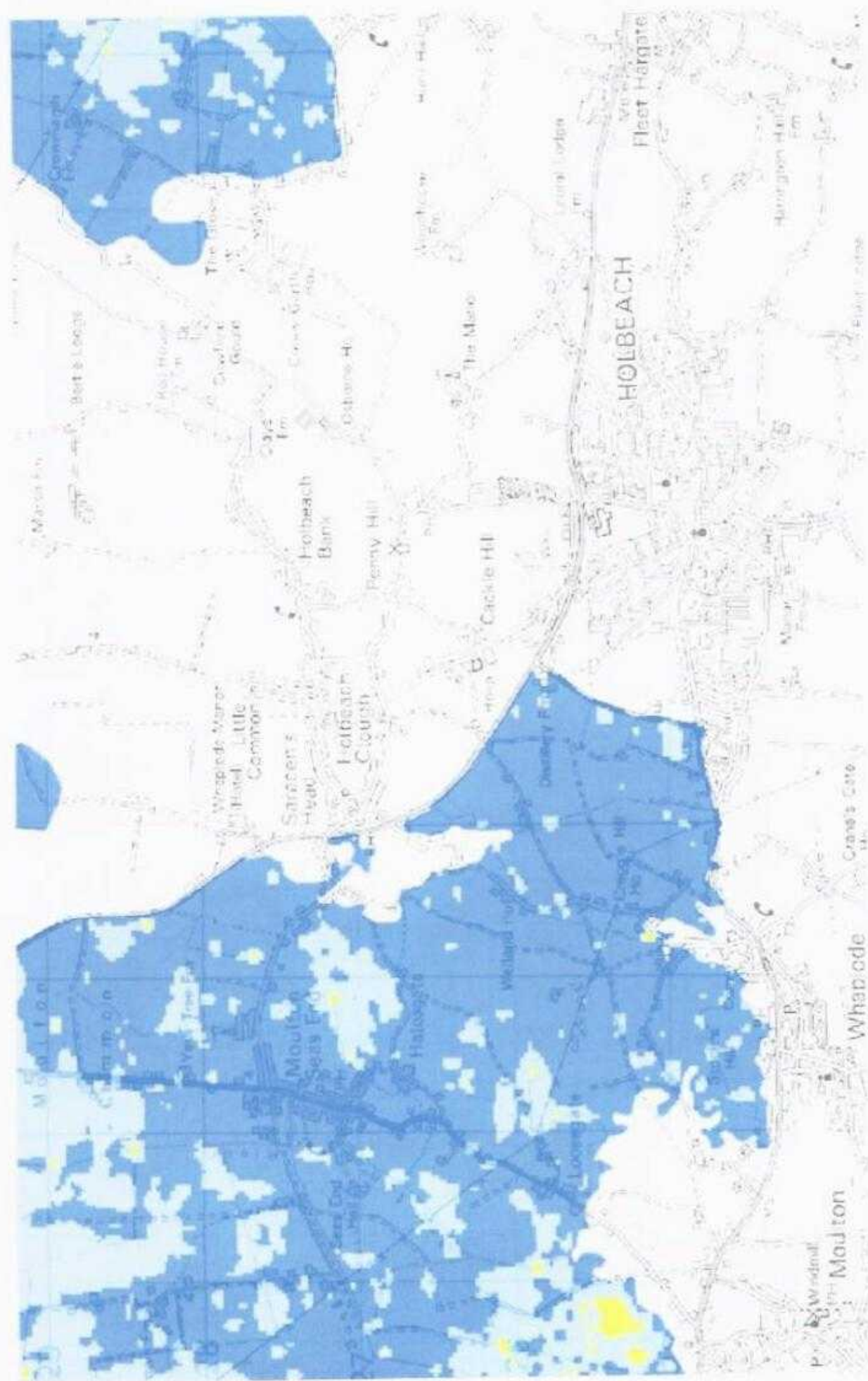
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2000

☒ Other national associations

organisations 





★ Modelled Breach Locations

Max Hazard	Max Depth (m)	Max Velocity (m/s)	Scenario year	Scenario Annual Chance	GCN Number
Less than 0.25 Less than 0.25 Between 0.25 and 1.25 Between 1.25 and 2.0 Greater than 2.0	0.25 - 0.50 0.50 - 1.0 1.0 - 1.5 1.5 - 2.0 2.0 +	0.25 - 0.5 0.5 - 1.0 1.0 - 1.5 1.5 - 2.0 2.0 +	July 2016	2115	GCN-2016-16226
Less than 0.25 Less than 0.25 Between 0.25 and 1.25 Between 1.25 and 2.0 Greater than 2.0	0.25 - 0.50 0.50 - 1.0 1.0 - 1.5 1.5 - 2.0 2.0 +	0.25 - 0.5 0.5 - 1.0 1.0 - 1.5 1.5 - 2.0 2.0 +	July 2016	2115	GCN-2016-16226

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 local surges or flood flows may all give different results.

The map only considers the consequences of a breach. It does not make any assumptions 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.

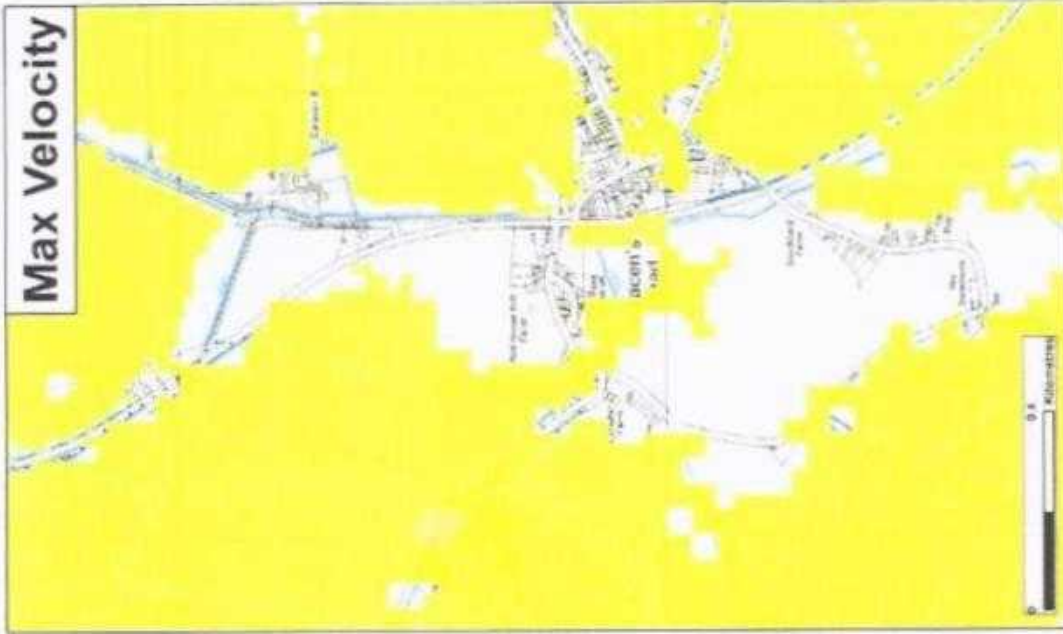
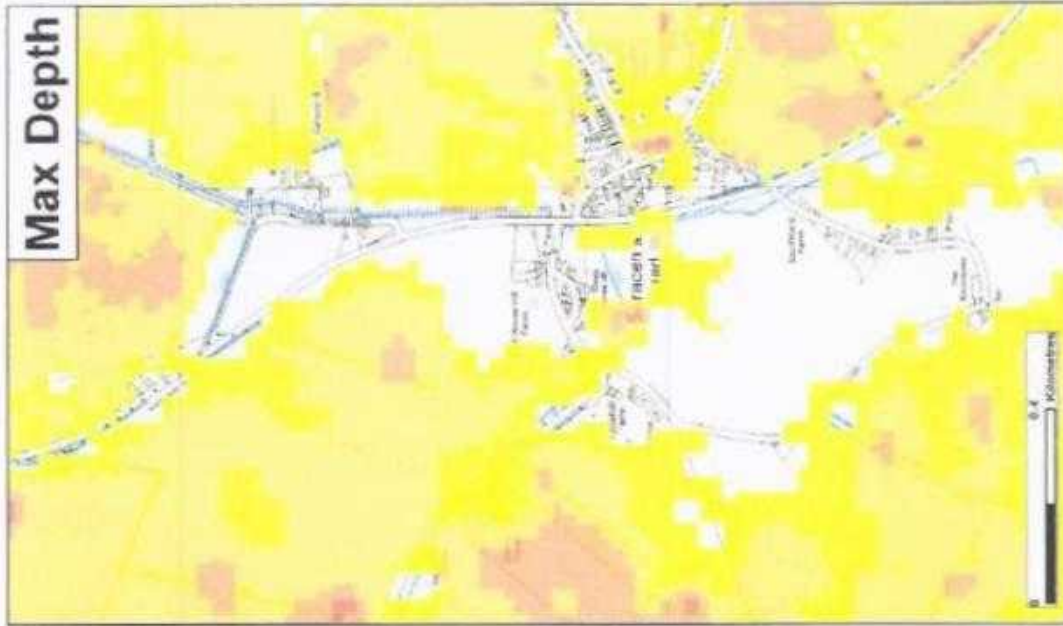
General Enquiries: 01223 506 506. Working Days: calls will be put up to the per minute from BT Standard Landline. Mobile and other providers: 01223 506 506.



Lincolnshire and Northamptonshire Tidal Breaching Hazard Mapping

Map Created on: 17/07/2016

This map is produced by the Environment Agency. It is based on the best available information and is not a guarantee of accuracy. It is not intended to be used for legal purposes. It is not intended to be used for legal purposes. It is not intended to be used for legal purposes.



★ Modelled Breach Locations					
In ter red	July 2015	Scenario year	2115	Scenario Annual Chance (1 in 1000)	CCN Number
see also the accompanying plan 'Location of Modelled Breaches'					
Max Hazard see Risk to People: F122081					
 Less than 0.75 (Low Hazard)					
 Between 0.75 and 1.25 (Medium Hazard for Gullies)					
 Between 1.25 and 2.0 (High Hazard for Main)					
 Greater than 2.0 (Danger for All)					
			Max Depth (m)		Max Velocity (m/s)
			 0 - 0.25	 0 - 0.3	
			 0.25 - 0.50	 0.3 - 1.0	
			 0.50 - 1.0	 1.0 - 1.5	
			 1.0 - 2.0	 1.5 - 2.5	
			 2.0 +	 2.5 +	
			CCN-2015-16320		

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.

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General Enquiries No. 01753 544 544. Weekend Enquiries call us by phone to help you decide from 9am to 5pm on weekdays. Email: enquiries@chngd.org.uk

