

**FLOOD RISK ASSESSMENT FOR
PROPOSED RESIDENTIAL DEVELOPMENT
AT 34 LITTLE LONDON,
SPALDING, Lincs.**

FINAL REPORT

GEOFF BEEL CONSULTANCY

JUNE 2014

GCB/WARRICK

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1.0 INTRODUCTION

- 1.1 A full planning application is to be submitted by Julian Warrick Architectural Design Consultant on behalf of Seagate Homes Ltd for proposed residential development at 34 Little London, Spalding, Lincs.
- 1.2 Planning approval requires a Flood Risk Assessment to accompany the application to meet the requirements and general principles contained in Paragraph 9 of the Technical Guidance of the National Planning Policy Framework (NPPF) and for approval by the Environment Agency.

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

The site is also shown within a defended area and in Flood Zone 1 of the South Holland District Council's Strategic Flood Risk Assessment Maps (2010) and located in the Welland and Deepings Internal Drainage Board district.

- 1.3 Geoff Beel Consultancy was appointed on 28th May 2014 to undertake a Flood Risk Assessment.

2.0 LOCATION

- 2.1 The development site is redundant commercial premises at 34 Little London, Spalding. The National Grid Reference of the central point of the site is TF 23752115.
- 2.2 The position and extent of the site are shown on Fig 1 – Block & Location Plans at the end of the document.
- 2.3 The site, located within the Welland and Deepings Internal Drainage Board district is shown within Flood Zone 3 as detailed on the Environment Agency Flood Zone Maps and in a defended area and Flood Zone 1 of the Council's Strategic Flood Risk Assessment Maps (2010).

3.0 THE SITE AND SEQUENTIAL TEST

- 3.1 The site is redundant commercial premises.
- 3.2 The area of development is approximately 0.27 hectare.
- 3.3 The proposed site layout consists the construction of fourteen two storey dwellings with shared access to London Road.

- 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 the 1 in 100 year fluvial event by a combination of defences, pumping stations and sluice gates meeting the requirements of NPPF.

The site is shown in Flood Zone 1 of the South Holland Strategic Flood Risk Assessment and therefore the Sequential Test is met.

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 and Practice 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 embankments is considered to be small.
- 4.2 The site is located within the Welland and Deepings Internal Drainage Board protected by the River Welland defences to the 1 in 100 year return period flood event. The nearest 'main drain' open watercourse, the Little London Pipeline is located within the site. Road level of London Road on the site frontage is 3.35m aOD whilst existing land levels are generally at 3.00m aOD.
- 4.3 The site and surrounding land drains to the Little London Pipeline and hence the Hills Drain to the South Drove Drain some 1750 metres upstream of Pode Hole Pumping Station. The Pode Hole Pumping Station discharges into the Vernatts Drain which ultimately flows into the tidal River Welland.
- 4.4 The Vernatts Drain is an embanked high level carrier conveying the surface water run-off from some 16165 hectares of land into the tidal River Welland at Surfleet Seas End.

The Welland and Deepings IDB have recently completed a three year programme to raise and strengthen the Vernatts Drain embankments to accommodate with 450mm freeboard, the design flood level of 3.96m aOD, estimated to be a 1 in 100 year return period event.

- 4.5 The South Drove Drain forms part of the comprehensive system of gravity and part pumped drainage providing an outfall from land and property situated between Spalding and Market Deeping.
- 4.6 Current maintenance standards within the Welland and Deepings Internal Drainage Board 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.

4.7 The fluvial River Welland is located approximately 250m east of the site with a standard of protection of 1 in 100 years return period. The Crowland and Cowbit Washes are situated upstream on the opposite bank of the River Welland offering integrated protection to Spalding and the surrounding district.

4.8 Fluvial flood levels of the River Welland at Little London Road Bridge are as follows:

	Present	Present + Climate Change
1%	4.39	4.68
0.1%	4.40	4.68

4.9 Maintenance standards of the Environment Agency's main rivers and defences are well maintained and regularly inspected for their asset condition.

5.0 POTENTIAL SOURCES OF FLOODING

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

- a) local blockages to existing IDB main drain system.
- b) storm return period of 1 in 50 years being exceeded
- c) failure of Pode Hole Pumping Station
- d) overtopping and breaching of the fluvial River Welland 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 Welland and Deepings 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.

It may be recommended by the Welland & Deepings IDB for an additional manhole to be constructed on the Little London Pipeline to safeguard against any blockage occurring giving rise to localised surface water flooding.

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

Previous historic rainfall events of 1968 and 1978, estimated to be greater than 1 in 100 year events, caused no flooding to any residential properties at the time and the Boards policy is to provide a standard of drainage which satisfies NPPF requirements of a 1 in 100 year return period for fluvial protection inclusive of the effects of climate change and development. The Boards policy regarding the connection of future developments to the arterial system enables a flexible approach to be adopted and meet the criteria for “sustainable urban drainage”. The probability of the site flooding from this potential source is also considered to be low.

- 5.3 The possible overtopping and breaching of the fluvial River Welland flood defences which may affect the site under extreme conditions is also considered to be very low. The standard of defence of 1 in 100 years would not be exceeded as the site frontage is protected by the Deepings High Bank and floodwaters would not affect the development site, as there is 620mm freeboard above the 1 in 100 year flood level inclusive of climate change.

The site is shown outside the extent of any floodwaters on both the Actual Depth and Residual Depth maps in year 2115 of the South Holland Strategic Flood Risk Assessment.

It is therefore proposed that floor levels of the development are to be 300mm above existing land level at 3.35m aOD to be compatible with London Road carriageway to safeguard against the remote possibility of overtopping of the River Welland defences and any risk of localised surface water flooding.

- 5.5 The developer should ensure that the eventual occupiers of the properties 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 contacting 0845 988 1188 and the occupiers should register with the Floodline Direct Warnings Service to receive any future flood warnings.

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. It is also intended to construct floor levels 300mm above existing land level at 3.35m aOD and to be compatible with London Road carriageway level.

- 7.2 The probability of the site flooding with water from any Welland and Deepings river system 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. Similarly the same standard is provided by the Environment Agency's main river and defences.
- 7.3 If under very extreme events, levels of floodwater from any Environment Agency or Welland and Deepings river 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.
- 7.4 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 proposed floor levels at 3.35m aOD will be appropriate for the design life of the development (i.e. 100 years).
- 7.5 Safe and dry access to and from the site would be available onto London Road and into Spalding Town Centre where land is in Flood Zone 1.

8.0 IMPACTS OF FLOODING

- 8.1 No significant impacts of flooding are anticipated.
- 8.2 Floor levels of the development will be at 3.35m aOD offering additional protection against impacts arising from any extreme short duration, localised events. Surface water drainage will be discharged to IDB requirements and Building Regulations approval.
- 8.3 The general location of the site within the catchment is such that if flooding occurred from any of the Environment Agency or Welland and Deepings river 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 and agricultural land.

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 a pumped sub-catchment of the Welland and Deepings IDB area and its location west of the River Welland fluvial defences.
- 9.2 Although within Flood Zone 3 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 of the whole District by appointed Consulting Engineers.

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

Breach scenarios of embankments or defences failing and/or being overtopped have also been carried out to establish Flood Risk Zones. The site is shown to be outside of any Hazard Zone.

- 9.4 As a result of the Strategic Flood Risk Assessment the South Drove Drain has been determined as providing protection against a 1 in 100 year return period event.

10.0 CONCLUSIONS AND RECOMMENDATIONS

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

- The proposed development is not in a Functional Floodplain. It is located in the Passive Floodplain protected by River Welland defences to a 1 in 100 year return period.
- Although the site is in Flood Zone 3, the actual risk of site flooding from any Environment Agency river system is very low. The site is shown in Flood Zone 1 of the South Holland District Council's Strategic Flood Risk Assessment Maps (2010).
- 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.
- Floor levels will be 300mm above existing ground levels at 3.35m aOD with flood resilient techniques incorporated into the design and construction of the proposed dwellings.
- On site surface water drainage will be discharged to IDB requirements and Building Regulations approval.
- Future occupiers of the properties should register with the Environment Agency's Floodline Warnings Direct service.
- Formal Land Drainage Byelaw Consent will be required from the Welland & Deepings IDB for any development within 9,00m of the Little London Pipeline and for surface water discharge arrangements.

DRAWING KEY

[illegible]

The depiction of a wall, fence or hedge does not necessarily represent a legal boundary. It is the client's responsibility to confirm legal boundaries with the vendor.

All trees measured on site have a general spread value attached. Heights of trees are approximate only.

When previously agreed, all workers exiting an area have been given a warning, and the area has been secured by vehicles or other sufficient obstructions.

If applicable, mandate covers will be flashed unless the significantly obstructs the flow of traffic or vehicular access.

Mandate covers will not be flashed if this were to present any health or safety risk to staff or the public. Inexplicable or cracked covers will also not be flashed.

At all times, all workers are instructed only and have not been provided unless indicated.

For safety reasons, pipe sizes and directions are estimated from above ground and are therefore approximate.

All drawing units, levels and dimensions are in meters, unless otherwise stated.

The data used for the computation of horizontal and vertical control for this survey was recorded using our survey grade GNSS receivers.

This data was provided by Letta Ossegelema-Jones and her colleagues at the correction service. Therefore primary survey control is based on OSG35(02)

A scale factor of 1 has been applied to this survey which has been based on station 1 and referenced to station 2.

plotting on paper may lead to a variety of scaling risks/errors due

Therefore any dimensions scaled from a paper reproduction of this survey should be treated with caution.

This drawing must be used in conjunction with all other relevant documentation.

REVISIONS/UPDATES & ASSOCIATED DETAILS		
Dwg No	Details	Date



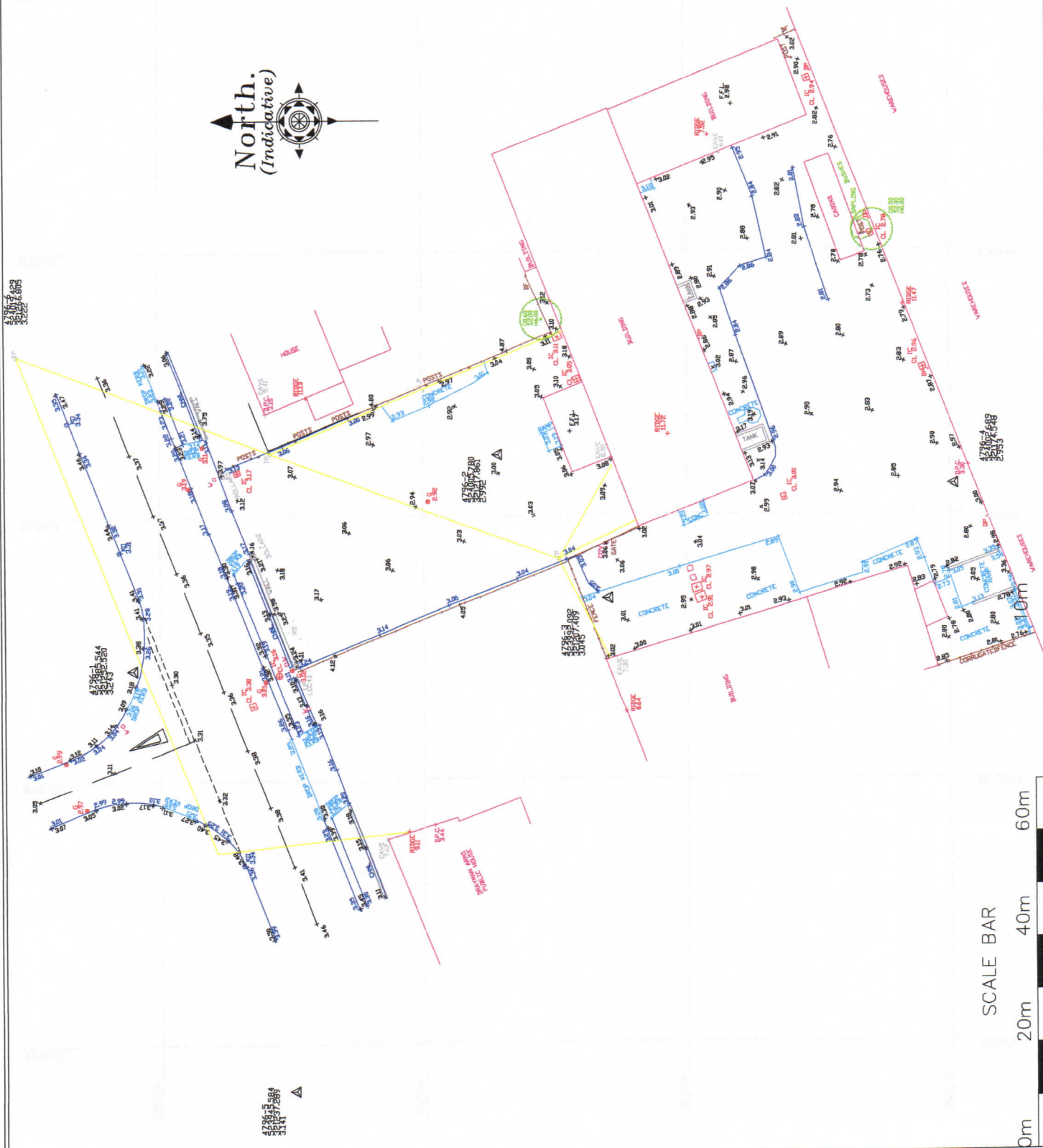
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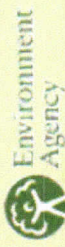
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SURVEY OF LAND AT 34
LITTLE LONDON ROAD
SPALDING, Lincs

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DRAWING NUMBER 4796-1		DRAWN BY CS
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Other topics for this area...

Flood Map for Planning (Rivers and Sea)

Flood Map for Planning (Rivers and Sea)

Other maps Data search Text only version

X: 524,103;Y: 320,912 at scale 1:10,000

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)

☒ Flood Map for Planning (Rivers and Sea)

Flood Zone 3

Flood Zone 2

Flood defences (Not all may be shown*)

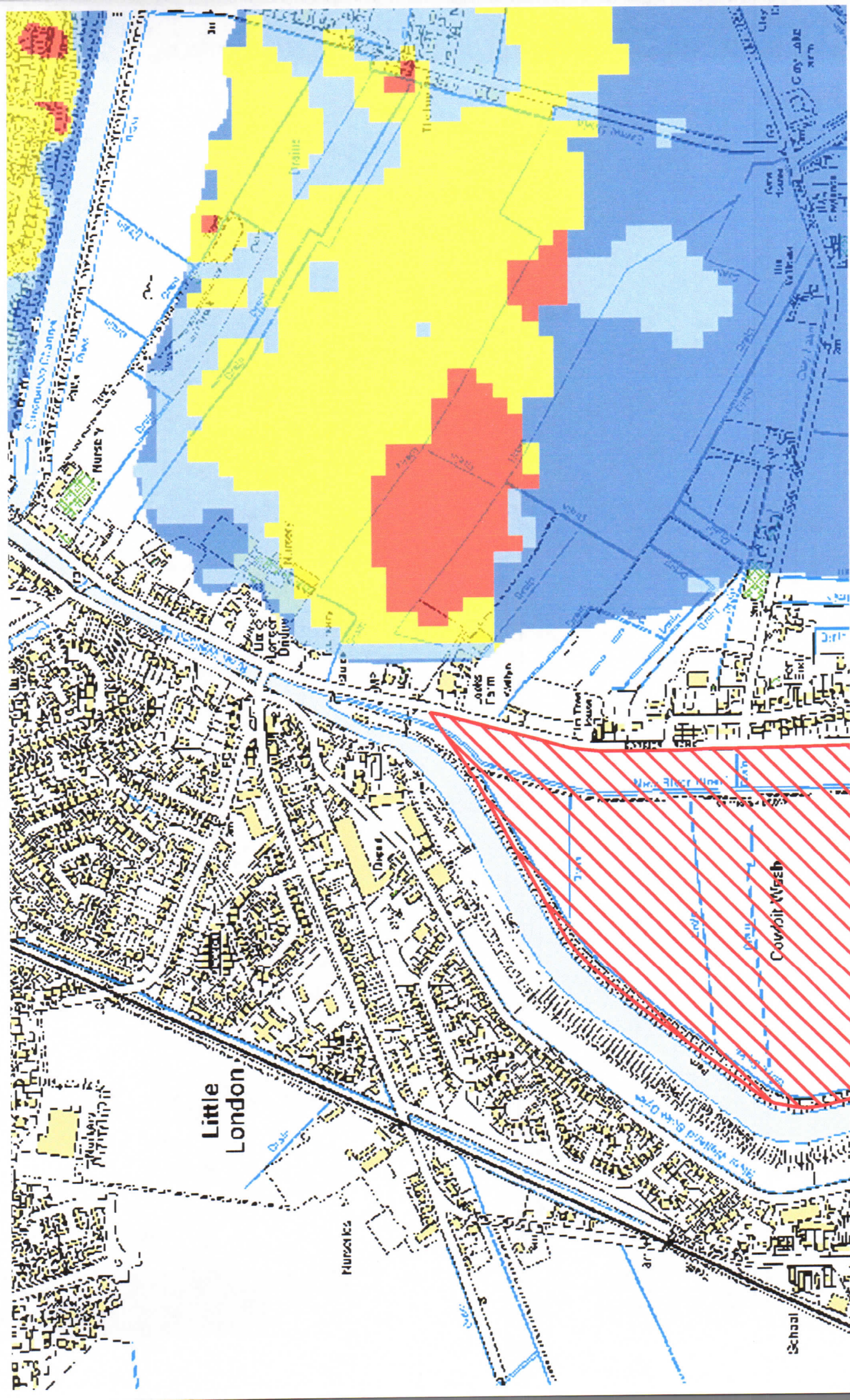
Areas benefiting from flood defences (Not all may be shown*)

Main rivers

Customers in Wales - From 1 April 2013 Natural Resources Wales (NRW) has taken over the responsibilities of the Environment Agency in Wales.
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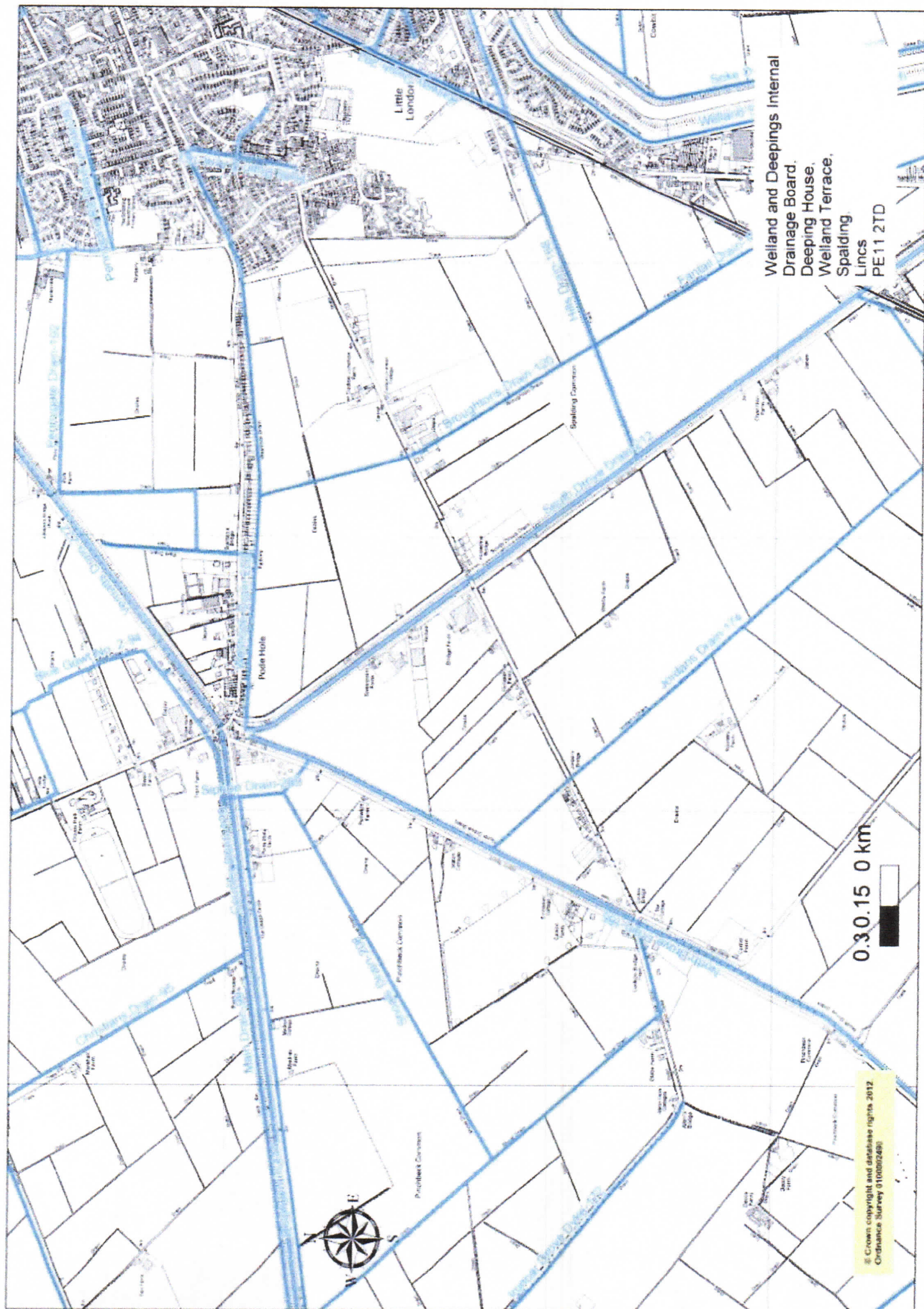
<http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=524500.0&y=322500.0&topic=floodmap&ep=map&scale=9&location=Spalding, Lincolnshire&lang=en&la...> 16/06/2014

Actual Depths 2115



This map illustrates the flood risk in the Little London area, which is situated along the River Thames. The map uses a color-coded system to indicate the level of flood risk: red for high risk, yellow for medium risk, and blue for low risk. The River Thames is shown as a prominent feature, with various drains and waterways branching off from it. Key locations marked on the map include the 'Little London Bridge', 'Nursery', 'Cowbit Wash', and 'New River Drain'. The map also shows the 'Little London' area, which is a mix of residential and industrial buildings. The text 'Little London' is printed in the bottom left corner of the map.

Little
London



Welland and Deepings Internal
Drainage Board,
Deeping House,
Welland Terrace,
Spalding
Lincs
PE11 2TD

0.30.15 0 km

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