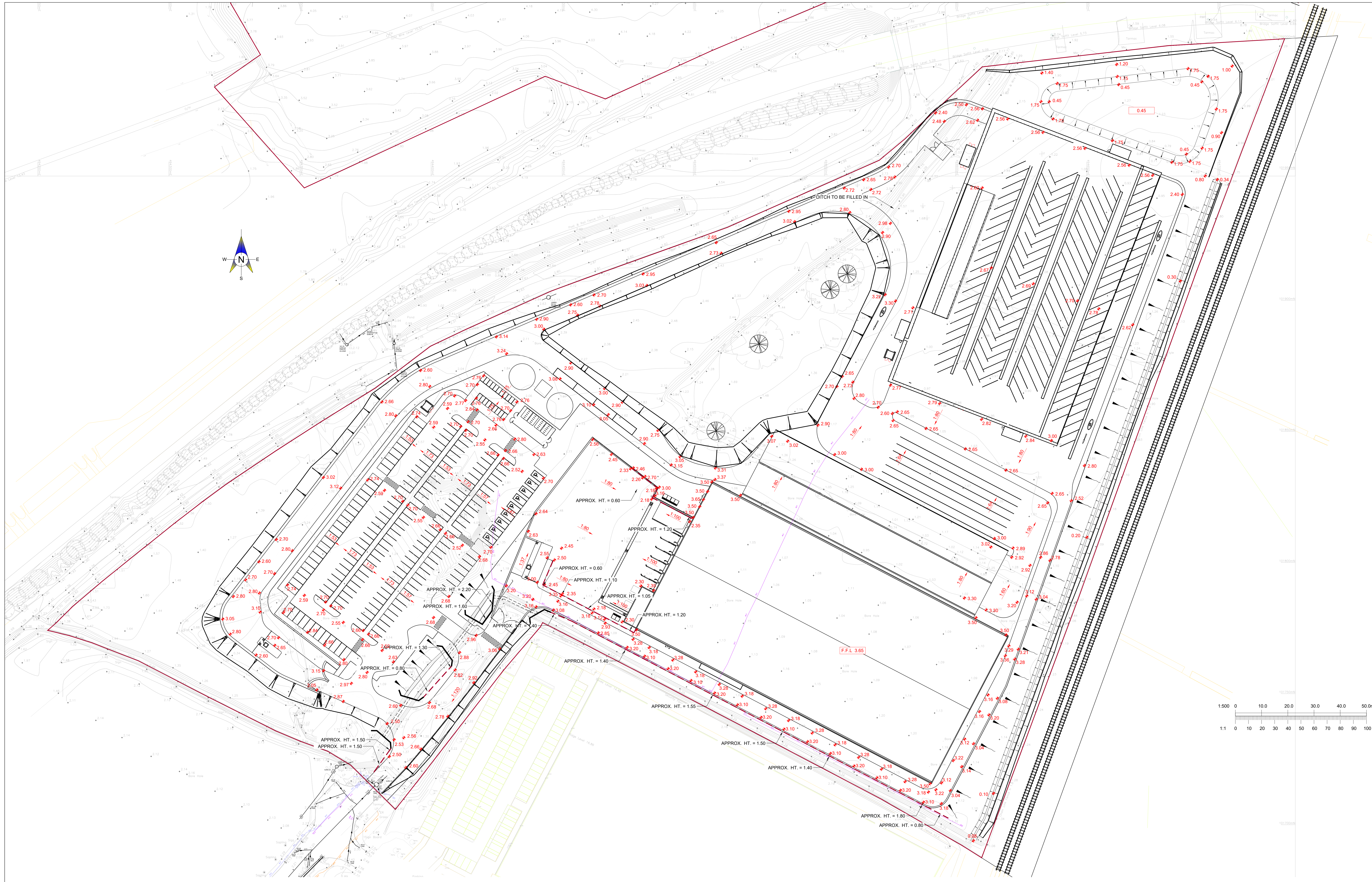
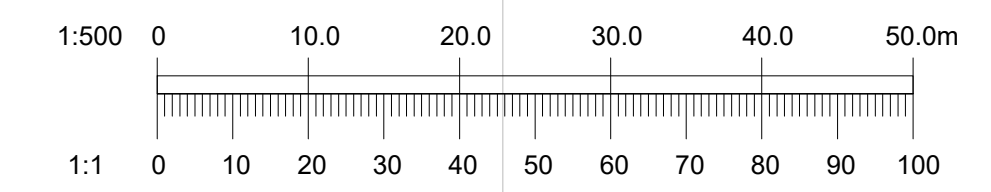




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Original drawings only to be taken from this drawing. All dimensions to be checked on site. Consultants to be informed immediately of any discrepancies before work proceeds.
1. If this drawing has been received electronically it is the recipients responsibility to print the document to the correct scale.
 2. All dimensions are in (m) unless otherwise noted.
 3. All levels are in meters above datum unless otherwise noted.
 4. This drawing is to be read in conjunction with all the relevant Engineers', Services Engineers, Manufacturers & Architects drawings and specifications.
 5. Final finished levels can be +/- 500mm from those shown.
 6. Existing levels taken from incomplete topographical survey dated May 2015.
 7. All levels next to kerb line are low side of kerb levels.
 8. Levels layout based on assumption that cover to certain drainage pipe soffits is as low as 600mm (pipes to be protected by concrete encasement).
 9. Levels may vary +/- 500mm from shown.
- ◆ 4.00 PROPOSED SITE LEVEL
- 1.40 EXISTING LEVEL
- 1.40 PROPOSED SITE GRADIENT
--- RETAINING WALL



P4	07.05.21	JM	SITE LAYOUT UPDATED.					
P3	23.04.21	JM	LEVELS ADDED. RET. WALLS SHOWN.					
P2	23.04.21	JM	LAYOUT UPDATED. SITE LOWERED.					
P1	22.03.21	JM	ISSUE FOR DISCUSSION.					
REV	DATE	BY	DESCRIPTION					
REVISIONS								
CLIENT								
LYSANDER ASSOCIATES LTD								
PROJECT TITLE								
OLDLANDS FARM, BOGNOR								
DRAWING TITLE								
PROPOSED LEVELS								

Appendix F – Consultation Response

Isobel,

Please find attached a plan showing the location of the flooding photos. I may need to send two emails as the photos are large files.

Hope this helps.

Regards,

[REDACTED]

[REDACTED]

Highways, Transport and Planning
Place Services
West Sussex County Council

 CALL  IM  EMAIL

[REDACTED]

[Report a problem with a road or pavement](#) or [raise a highways related enquiry](#)

Follow us at  [@WSHighways](#)

From: Isobel Randall [<mailto:Isobel.Randall@deltasimons.com>]

Sent: 21 October 2020 13:47

To: [REDACTED]

Subject: RE: 20-1543.02 Bognor Regis, Oldlands Farm

Hi [REDACTED]

Thank you for the information. That would be great if you could follow up.

Kind Regards,

Isobel Randall

Graduate - Water Services

Suite 4A, 1 Portland St, Manchester M1 3BE

www.deltasimons.com

<https://www.deltasimons.com/services/water-services/>



Birmingham Bristol Dublin Leeds Lincoln London **Manchester** Newcastle Norwich Nottingham

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From: [REDACTED]
Sent: 21 October 2020 09:39
To: Isobel Randall <Isobel.Randall@deltasimons.com>
Subject: RE: 20-1543.02 Bognor Regis, Oldlands Farm

Isobel,

Last winter was one of the wettest on record, so it was not surprising that areas within Flood Zone 2 were covered in water. The area in question is linked to the Lidsey Rife (see attached plan) which outfalls into the sea at Felpham. This outfall, twice a day, becomes tide locked resulting in the local rife network backing up and flooding the flood plain during very wet periods.

Re. any photos I have, I will send them over tomorrow.

Hope this helps.

Regards,

[REDACTED]

[REDACTED]

Highways, Transport and Planning
Place Services
West Sussex County Council

 CALL  IM  EMAIL

[REDACTED]

E-mail: [REDACTED]

[Report a problem with a road or pavement](#) or [raise a highways related enquiry](#)

Follow us at  [@WSHighways](#)

From: Isobel Randall [<mailto:Isobel.Randall@deltasimons.com>]
Sent: 20 October 2020 17:42
To: [REDACTED]
Subject: RE: 20-1543.02 Bognor Regis, Oldlands Farm

Hi [REDACTED]

In addition to this, could you provide any pertinent information of the flood last winter such as the cause, impact, and details of any action taken to mitigate risks of these events reoccurring in the future?

Kind Regards,

Isobel Randall
Graduate - Water Services

Suite 4A, 1 Portland St, Manchester M1 3BE
www.deltasimons.com
<https://www.deltasimons.com/services/water-services/>



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From: Isobel Randall
Sent: 20 October 2020 17:15
To: [REDACTED]
Subject: RE: 20-1543.02 DBN4 Bognor Regis, Oldlands Farm

Hi [REDACTED]

Thanks for your response regarding the below- please could you potentially provide those photographs or any additional details (i.e. the source of the flooding) you have of the flooded Site?

Kind Regards,

Isobel Randall
Graduate - Water Services

Suite 4A, 1 Portland St, Manchester M1 3BE
www.deltasimons.com
<https://www.deltasimons.com/services/water-services/>



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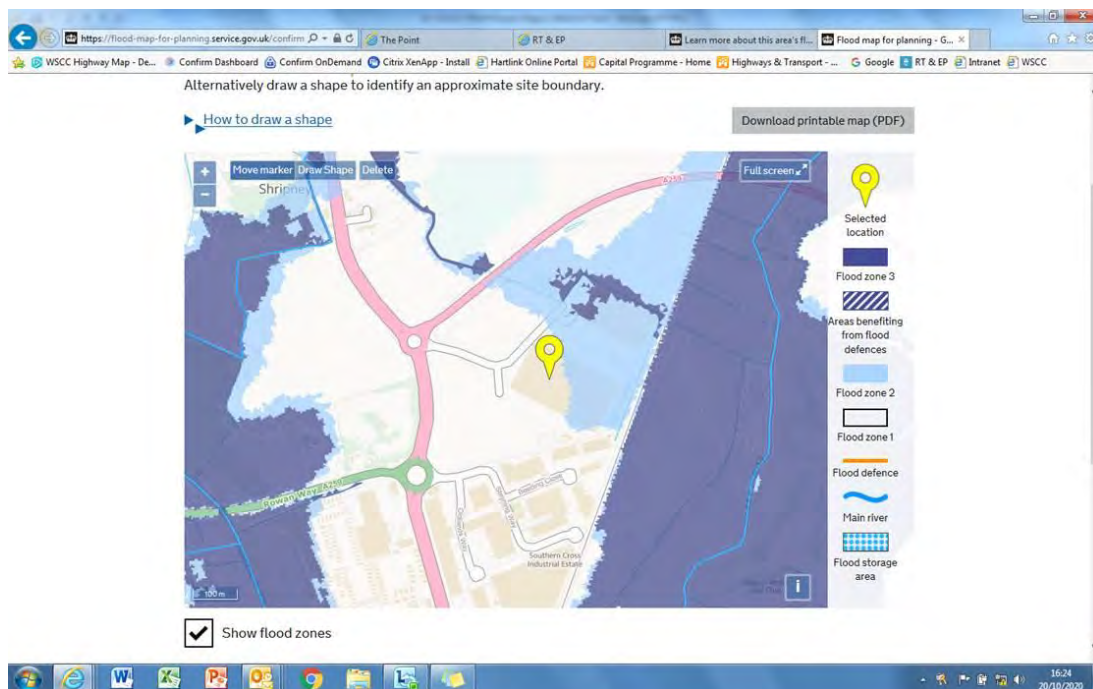
Delta-Simons Environmental Consultants Ltd, 3 Henley Office Park, Doddington Road, Lincoln LN6 3QR.
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From: [REDACTED] **On Behalf Of** Flood Risk Management

Sent: 20 October 2020 16:29

Subject: RE: 20-1543.02 DBN4 Bognor Regis, Oldlands Farm

Further to your recent enquiry.
The area is shown to be at risk of flooding on the current EA mapping. See below:



Oddly this is completely different to the mapping in your original email??
I'm also aware that last winter 2019/20 this area was completely flooded. I have photos shows this at home.

Hope this helps.

Regards,

[REDACTED]

[REDACTED]

Highways, Transport and Planning
Place Services
West Sussex County Council

 CALL  IM  EMAIL

[REDACTED]

[Report a problem with a road or pavement](#) or [raise a highways related enquiry](#)

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[REDACTED]

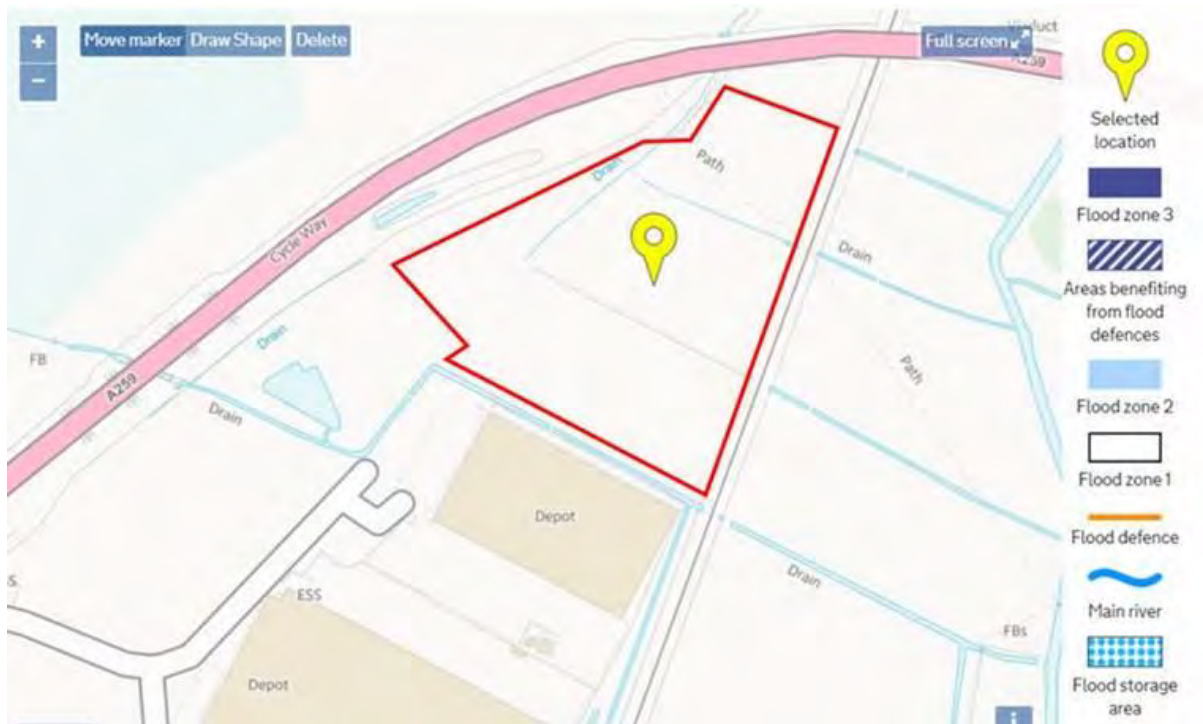
Sent: 23 September 2020 15:31
To: Flood Risk Management
Cc: Isobel Randall; [REDACTED]
Subject: 20-1543.02 DBN4 Bognor Regis, Oldlands Farm

Good Afternoon,

I am completing a Flood Risk Assessment for an industrial unit development at Oldlands Farm Cottages, Bognor Regis, PO22 9NN (See location plan below).

Please can you advise in the following in addition to that provided by the EA:

- 1) Do you have any information relating to current or historic instances of fluvial, groundwater, surface water and sewer (foul and surface) flooding at or near this location?
- 2) Any further information that you are able to provide which may assist us with a Flood Risk Assessment at the site would be appreciated.



Kind regards



www.deltasimons.com



[Birmingham](#) [Bristol](#) [Dublin](#) [Leeds](#) [Lincoln](#) [London](#) [Manchester](#) [Newcastle](#) [Norwich](#) [Nottingham](#)

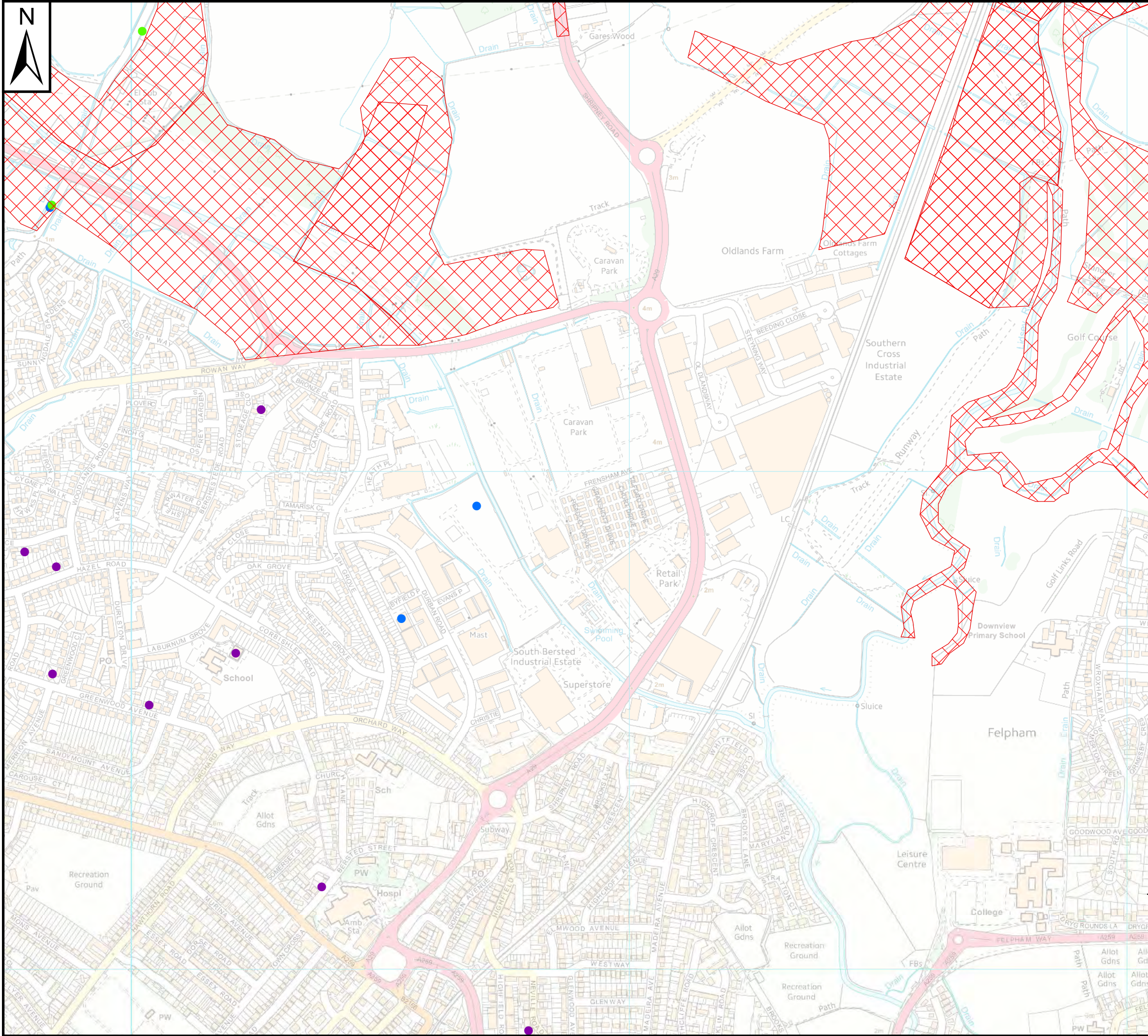
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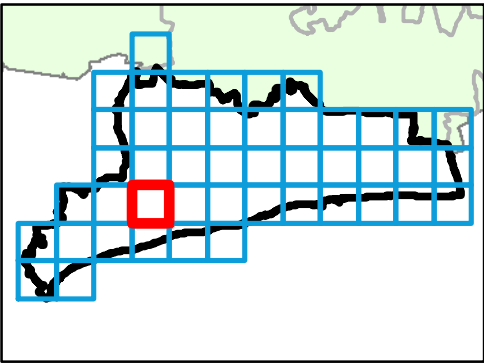
Notes

The Historic Flooding Map shows the recorded incidents and flood outlines provided by Arun District Council, West Sussex County Council, Southern Water and Environment Agency. Historical flood extent was obtained from the Environment Agency.

Flooding incidents provided have been categorised based upon the details provided in the records. Unknown flood points could not be determined from the information provided, and therefore could be from a number of sources.

Please note that not all historical records may be shown on this map, and that it is therefore advised you contact Arun District Council for updated information post 2015.

Key Plan



Legend

- Arun District SFRA boundary
- Historic flood outline
- Fluvial
- Surface Water
- Failure
- Unknown
- Coastal
- Tidal

Source of flooding



REF	Date	Comments
A	June 2016	-
B		
C		

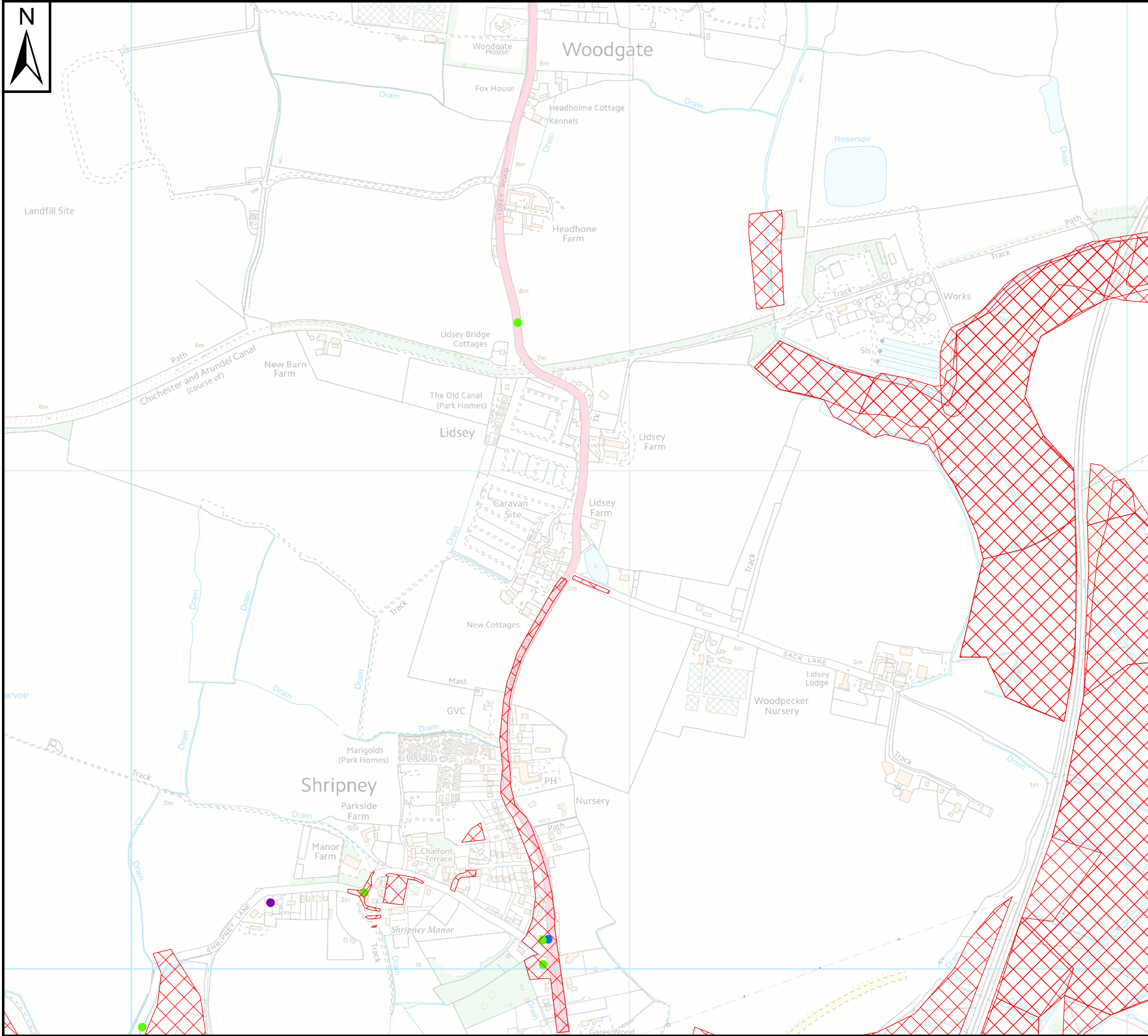
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ARUN DISTRICT COUNCIL LEVEL 1 SFRA: APPENDIX H HISTORIC FLOODING RECORDS

Sheet No: 11 of 46 Index Number: ADC_11

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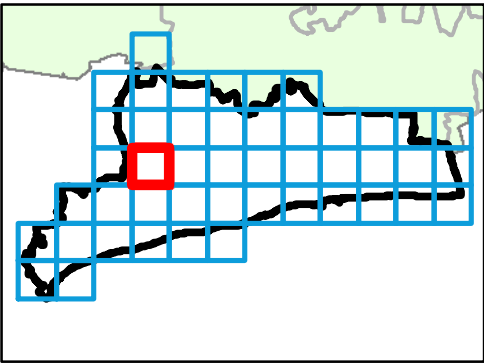
Notes

The Historic Flooding Map shows the recorded incidents and flood outlines provided by Arun District Council, West Sussex County Council, Southern Water and Environment Agency. Historical flood extent was obtained from the Environment Agency.

Flooding incidents provided have been categorised based upon the details provided in the records. Unknown flood points could not be determined from the information provided, and therefore could be from a number of sources.

Please note that not all historical records may be shown on this map, and that it is therefore advised you contact Arun District Council for updated information post 2015.

Key Plan



Legend

- Arun District SFRA boundary
- Historic flood outline
- Fluvial
- Coastal
- Tidal
- Surface Water
- Failure
- Unknown

Source of flooding



REF	Date	Comments
A	June 2016	-
B		
C		

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ARUN DISTRICT COUNCIL LEVEL 1 SFRA: APPENDIX H HISTORIC FLOODING RECORDS

Sheet No: 21 of 46 Index Number: ADC_21

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Appendix G – Historic Flood Mapping



LEGEND

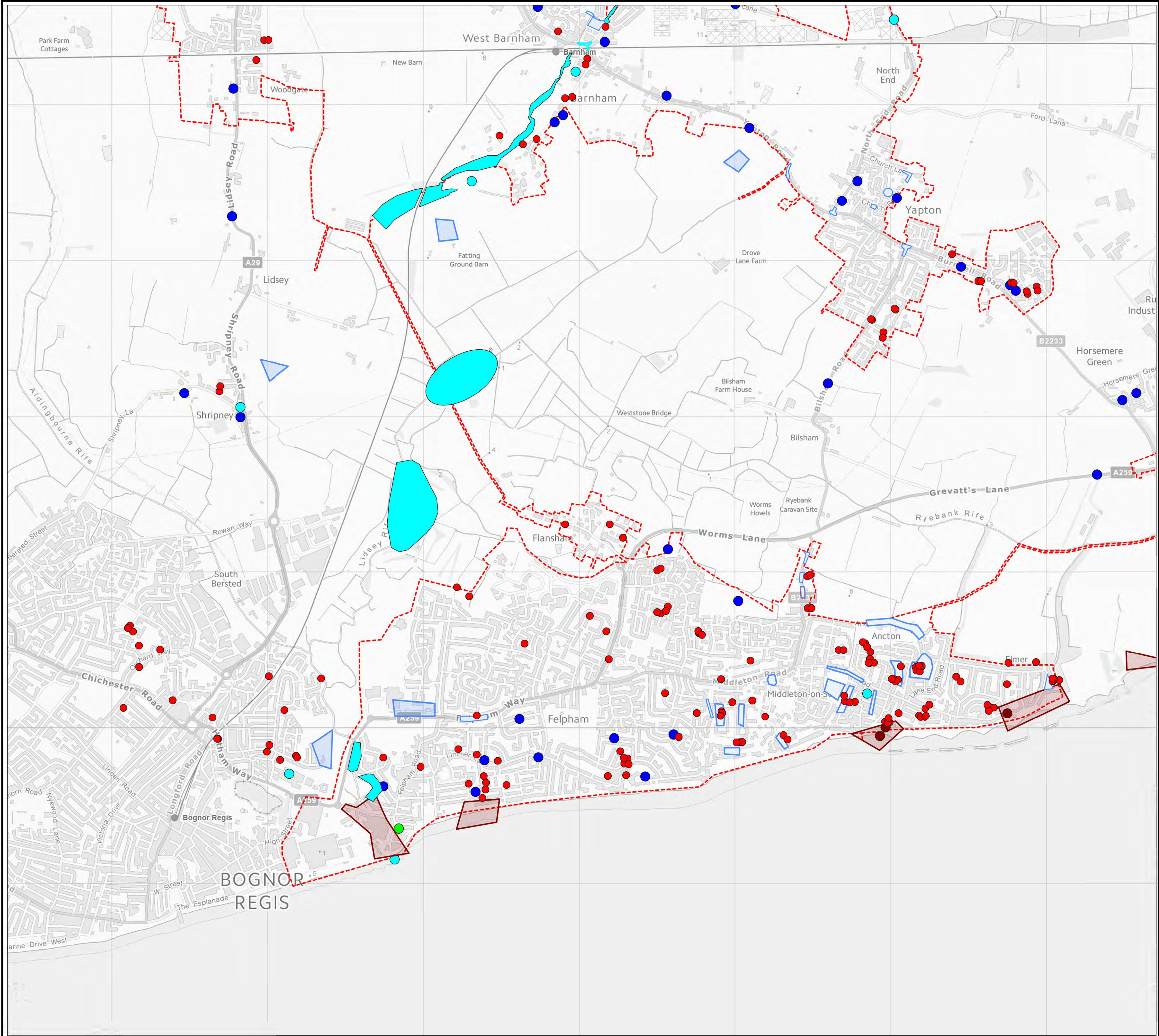
- Developable Area
- EA Historic Flood Outline
- FCS / Fill Extraction Area

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TITLE:
EA Historic Flood Map
Oldlands Farm, Bognor Regis, PO22 9NN

DRAWN BY: AB	SCALE (@A4): 1:6000	PROJECT NO: 20-1543.06
CHECKED BY: AP	REVISION: -	FIGURE NO:
DATE: 20 May 2021	G1	



- Coastal Flooding
- Fluvial Flooding
- Surface Water Flooding
- Tidal Flooding
- Sewer Flooding (Hydraulic Overload) last 5 yrs (centroid of postcode).
- Fluvial Flooding (Zone)
- Ground Water Flooding (Zone)
- Surface Water Flooding (Zone)
- Surface Water & Fluvial Flooding (Zone)
- Coastal Flooding (Zone)
- SWMP Study Boundary

ATKINS

Consulting Engineers,
Woodcote Grove,
Ashley Road,
Epsom, Surrey, England,
KT18 5BW

Fax (01372) 740055
Tel. (01372) 726140



Project title
Lidsey Surface Water Management Plan (SWMP)

Drawing title
**Historic Flooding
Appendix A - Plan 3 (South)**

Original Scale	Drawn JJ	Checked WR	Auth'd MM
	Date 04/14	Date 04/14	Date 04/14

Drawing Number	Rev
Report Appendix.	

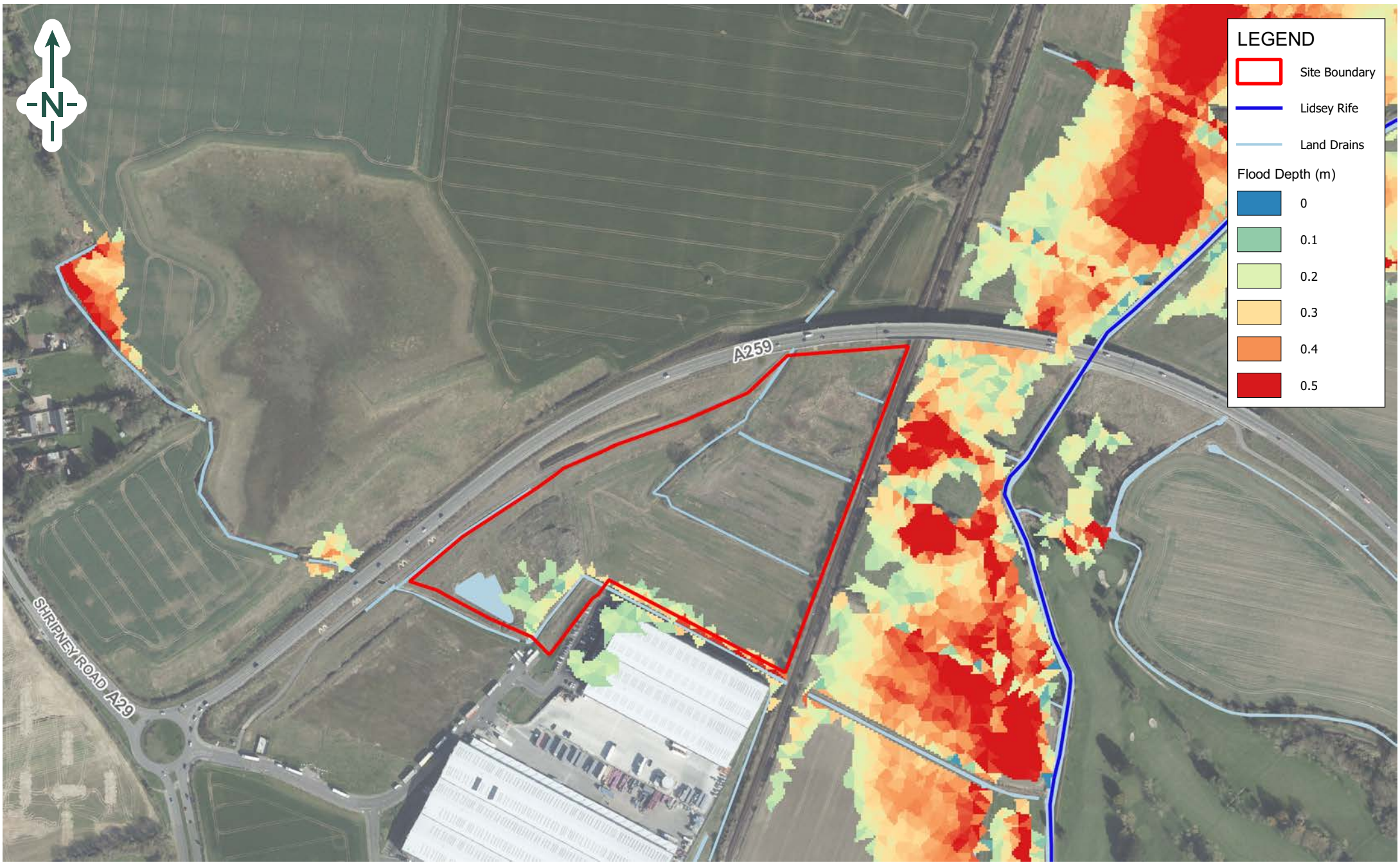
Appendix H – EA 2015 Model Fluvial Flood Extent and Depth Outputs



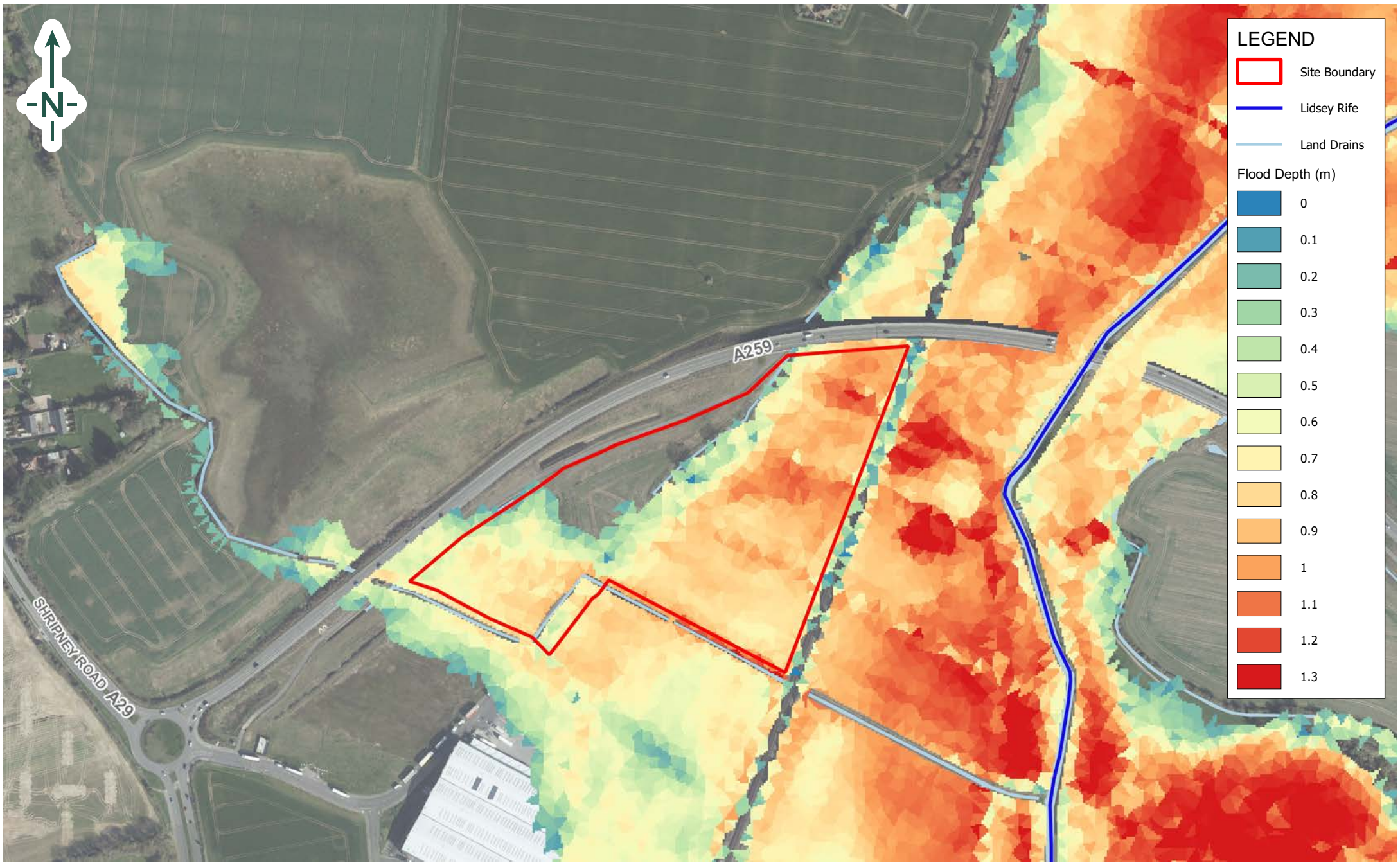
LEGEND

- Site Boundary
- Lidsey Rife
- Land Drains
- Flood Depths (m)
 - 0
 - 0.1
 - 0.2
 - 0.3
 - 0.4
 - 0.5

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LEGEND

Site Boundary

Lidsey Rife

Land Drains

Flood Depth (m)

0

0.1

0.2

0.3

0.4

0.5

0.6

0.7

0.8

0.9

1

1.1

1.2

1.3

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Appendix I – EA 2015 Model Combined Fluvial and Tidal Flood Extent and Depth Outputs



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TITLE:

EA Modelled Flood Extent and Depths Combined (Fluvial and Tidal)- 5% AEP (Defended)
Oldlands Farm, Bognor Regis, PO22 9NN

DRAWN BY:

AB

SCALE (@A4):

1:4500

PROJECT NO:

20-1543.06

CHECKED BY:

AP

REVISION:

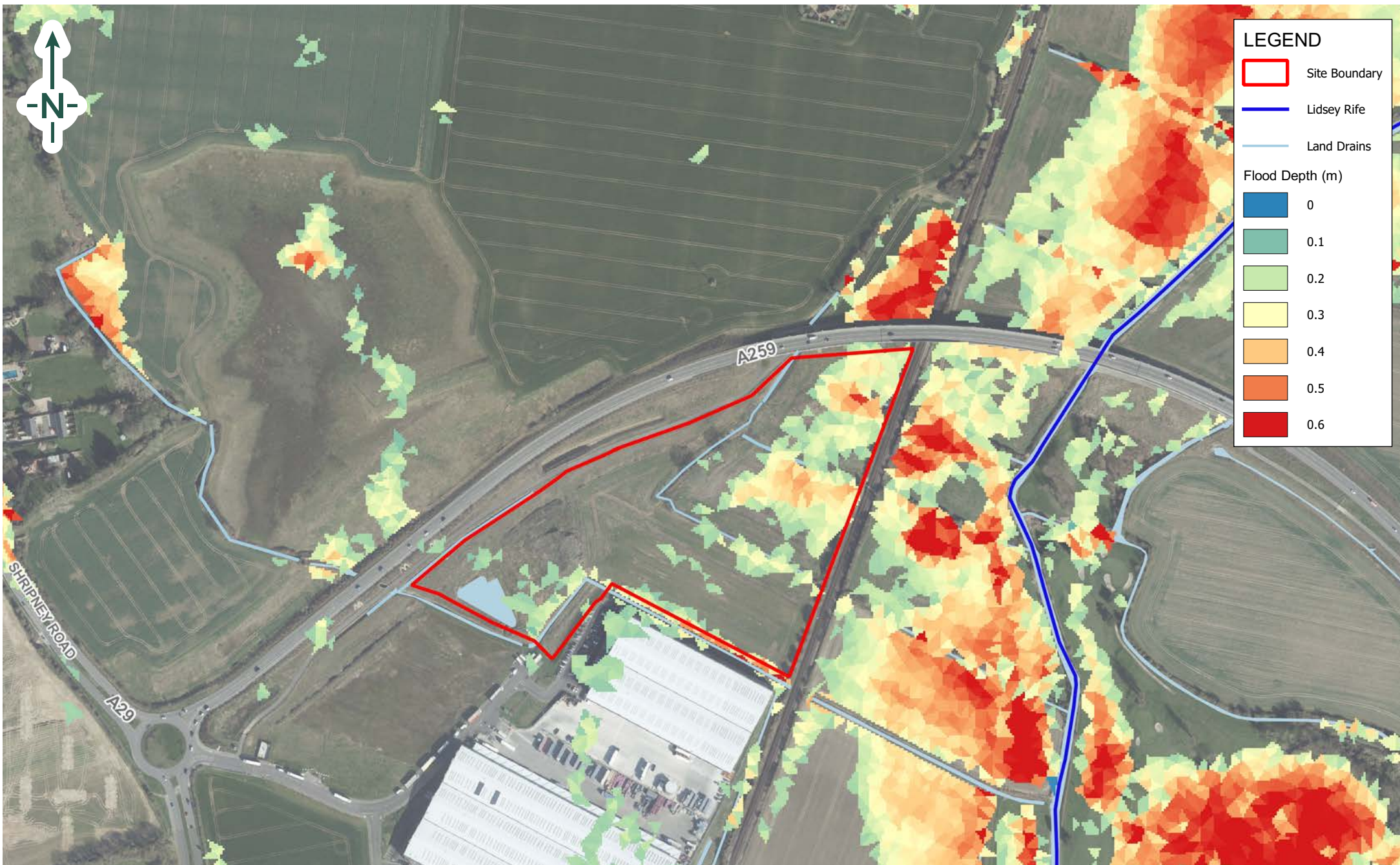
-

FIGURE NO:

DATE:

07 May 2021

11



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TITLE:

EA Modelled Flood Extent and Depths Combined (Fluvial and Tidal)- 1% AEP (Defended)
Oldlands Farm, Bognor Regis, PO22 9NN

DRAWN BY:

AB

SCALE (@A4):

1:4500

PROJECT NO:

20-1543.06

CHECKED BY:

AP

REVISION:

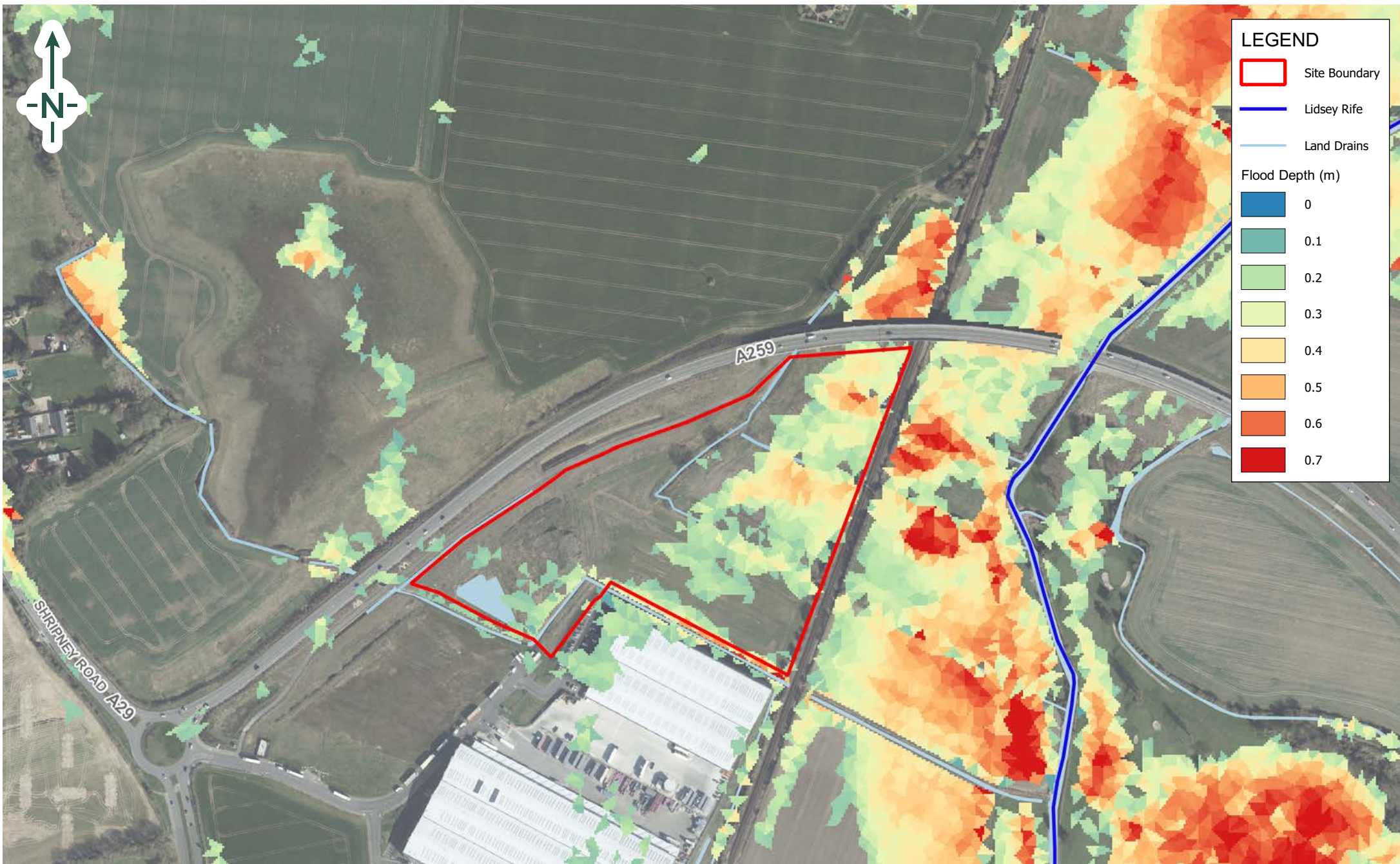
-

FIGURE NO:

12

DATE:

07 May 2021



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TITLE:

EA Modelled Flood Extent and Depths Combined (Fluvial and Tidal)- 1% AEP (Un defended)
Oldlands Farm, Bognor Regis, PO22 9NN

DRAWN BY:

AB

SCALE (@A4):

1:4500

PROJECT NO:

20-1543.06

CHECKED BY:

AP

REVISION:

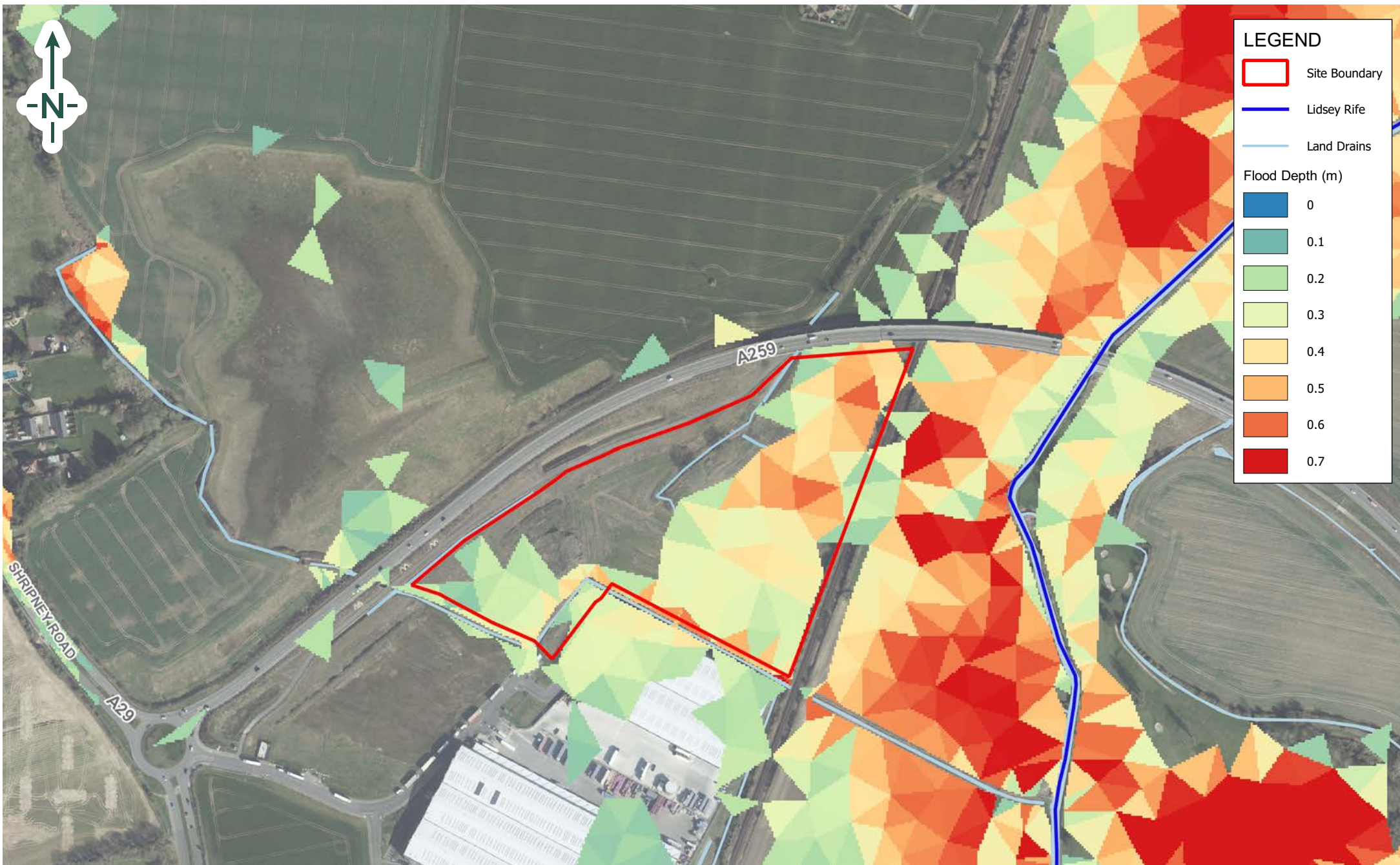
-

FIGURE NO:

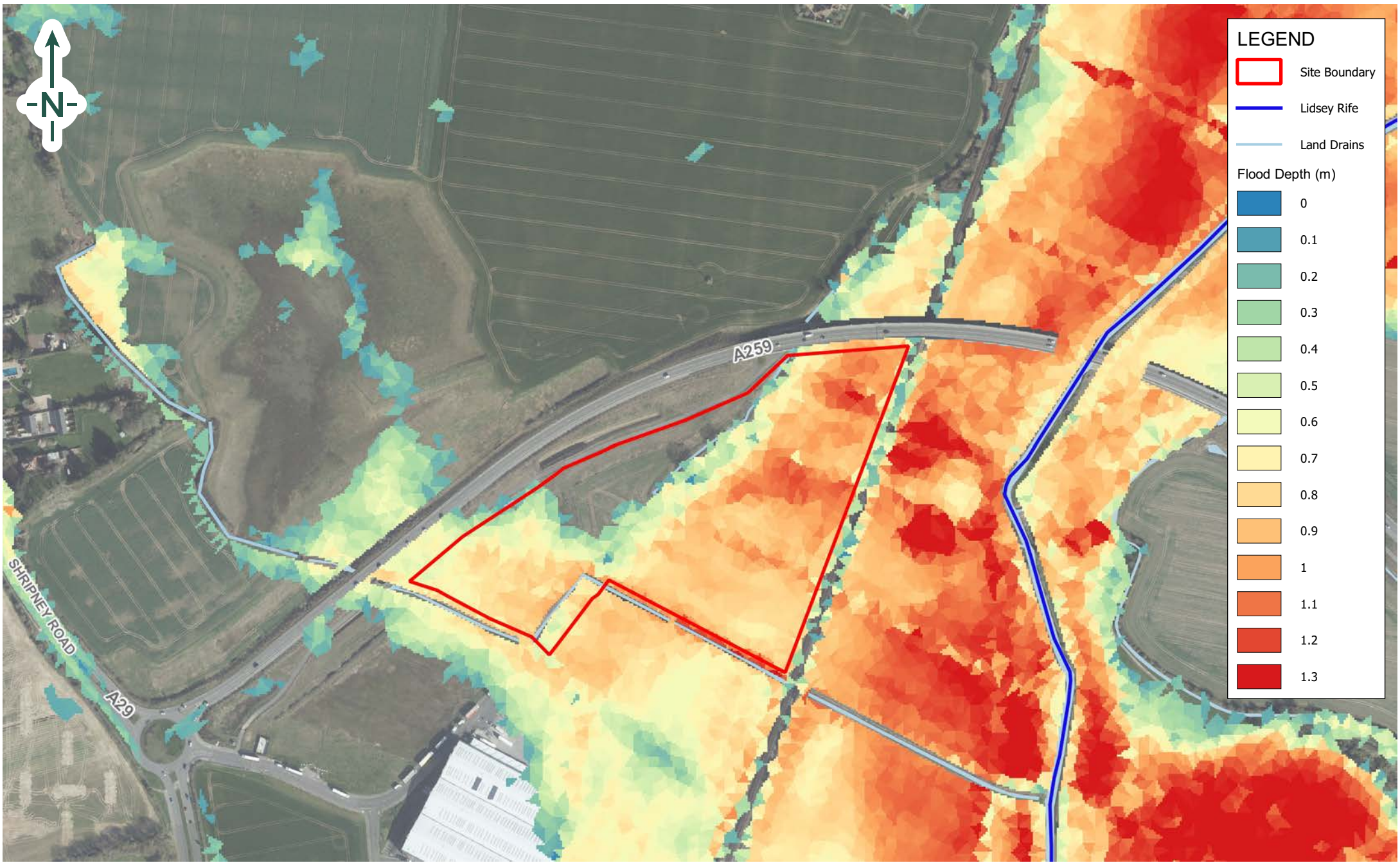
DATE:

07 May 2021

I3



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LEGEND

Site Boundary

Lidsey Rife

Land Drains

Flood Depth (m)

0

0.1

0.2

0.3

0.4

0.5

0.6

0.7

0.8

0.9

1

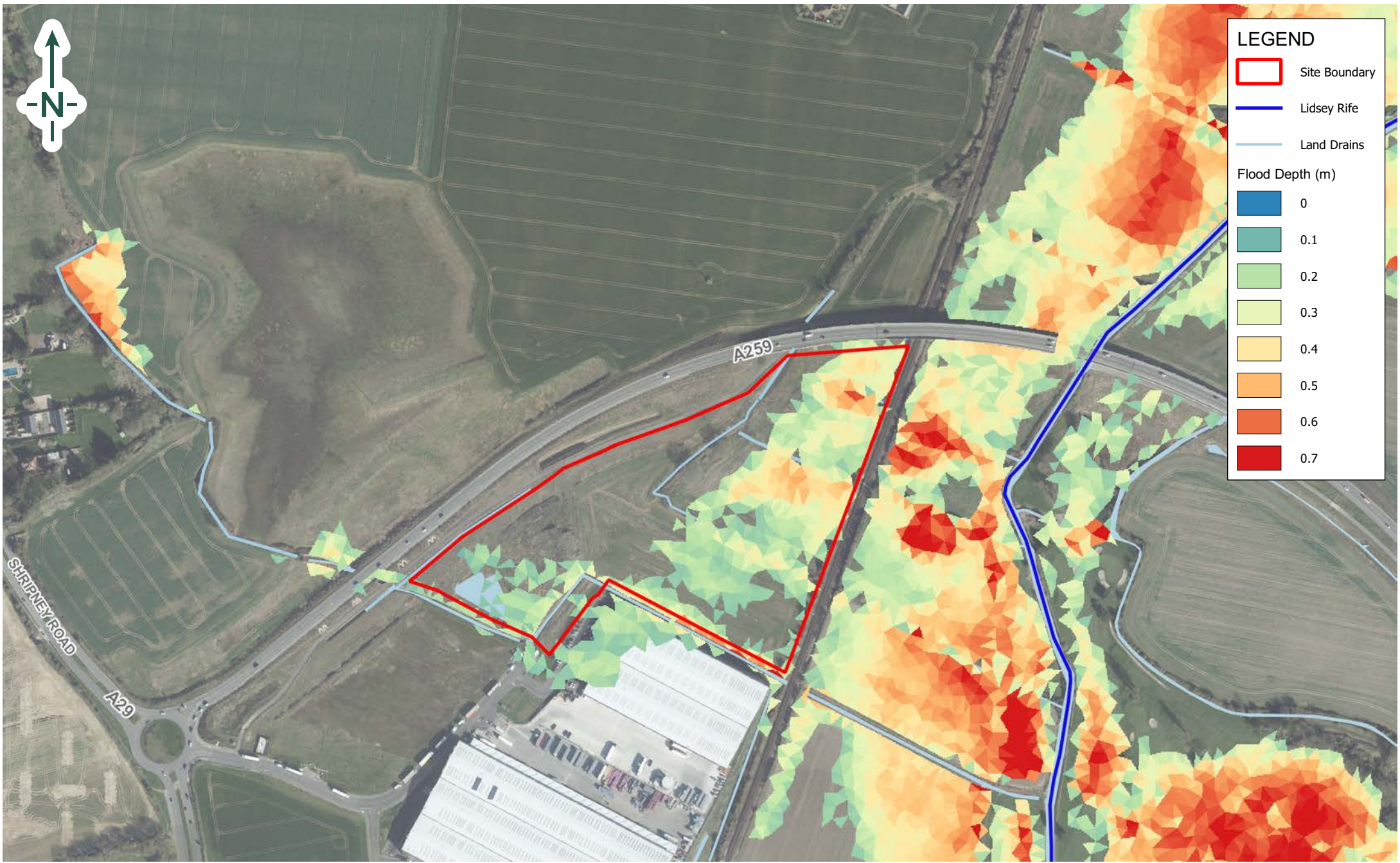
1.1

1.2

1.3

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Appendix J – EA 2017 Model Fluvial Flood Extent and Depth Outputs (Climate Change)



LEGEND

Site Boundary

Lidsey Rife

Land Drains

Flood Depth (m)

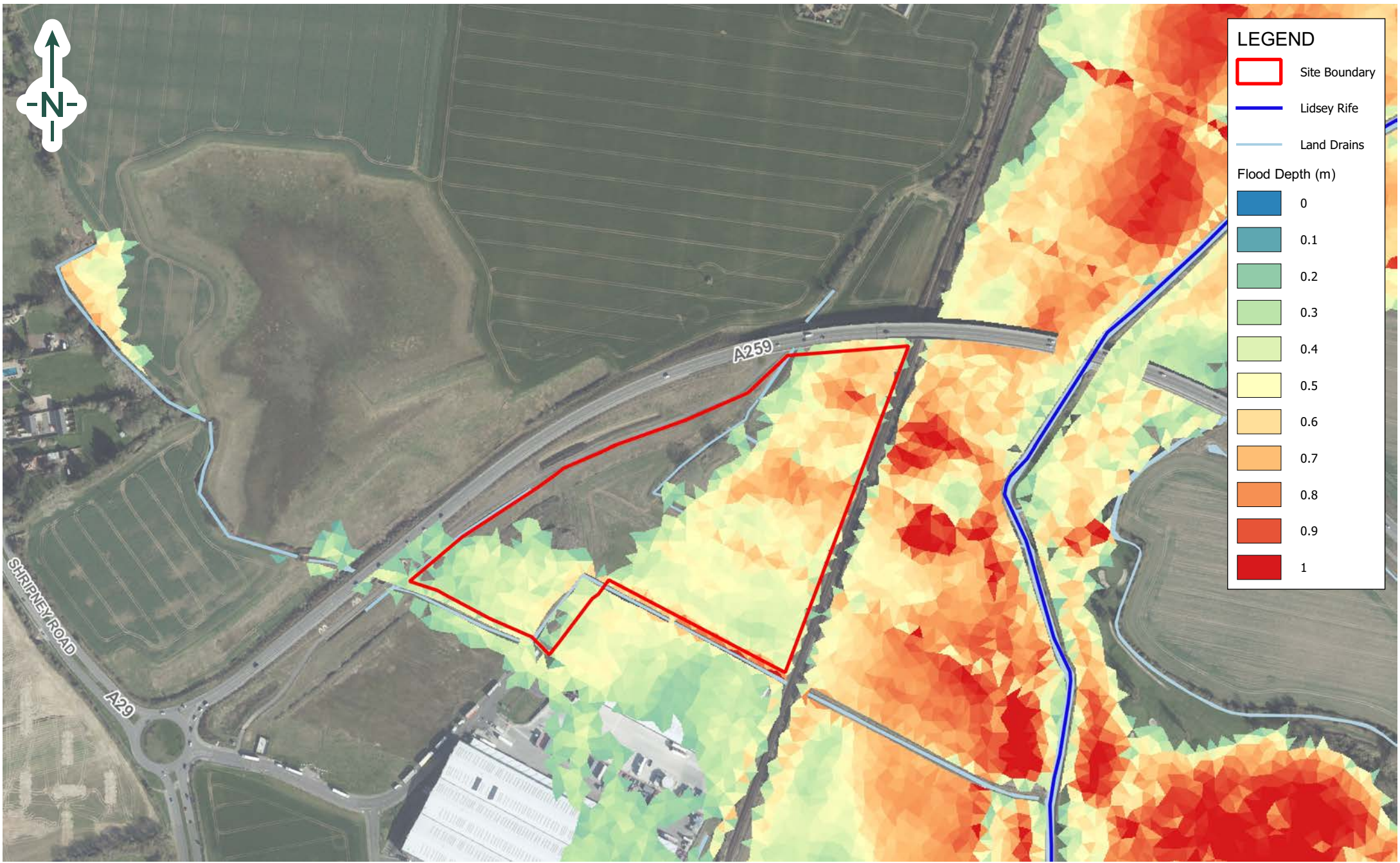
	0
	0.1
	0.2
	0.3
	0.4
	0.5
	0.6
	0.7

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TITLE:
EA Modelled Flood Extent and Depths - 1% AEP + 35% CC (Defended)
Oldlands Farm, Bognor Regis, PO22 9NN

DRAWN BY: AB	SCALE (@A4): 1:4500	PROJECT NO: 20-1543.06
CHECKED BY: AP	REVISION: -	FIGURE NO:
DATE: 07 May 2021		J1



LEGEND

Site Boundary

Lidsey Rife

Land Drains

Flood Depth (m)

0

0.1

0.2

0.3

0.4

0.5

0.6

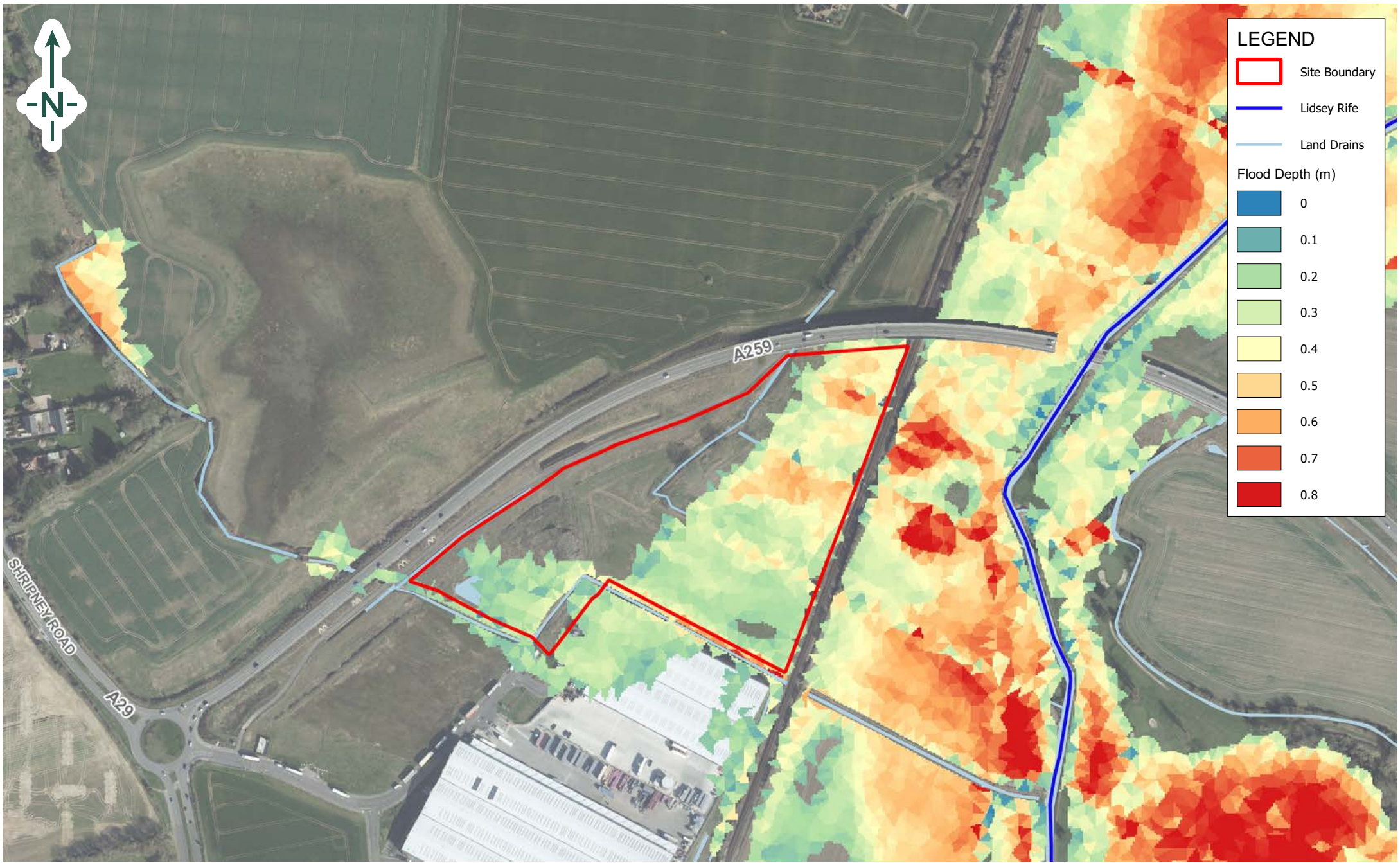
0.7

0.8

0.9

1

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LEGEND

Site Boundary

Lidsey Rife

Land Drains

Flood Depth (m)

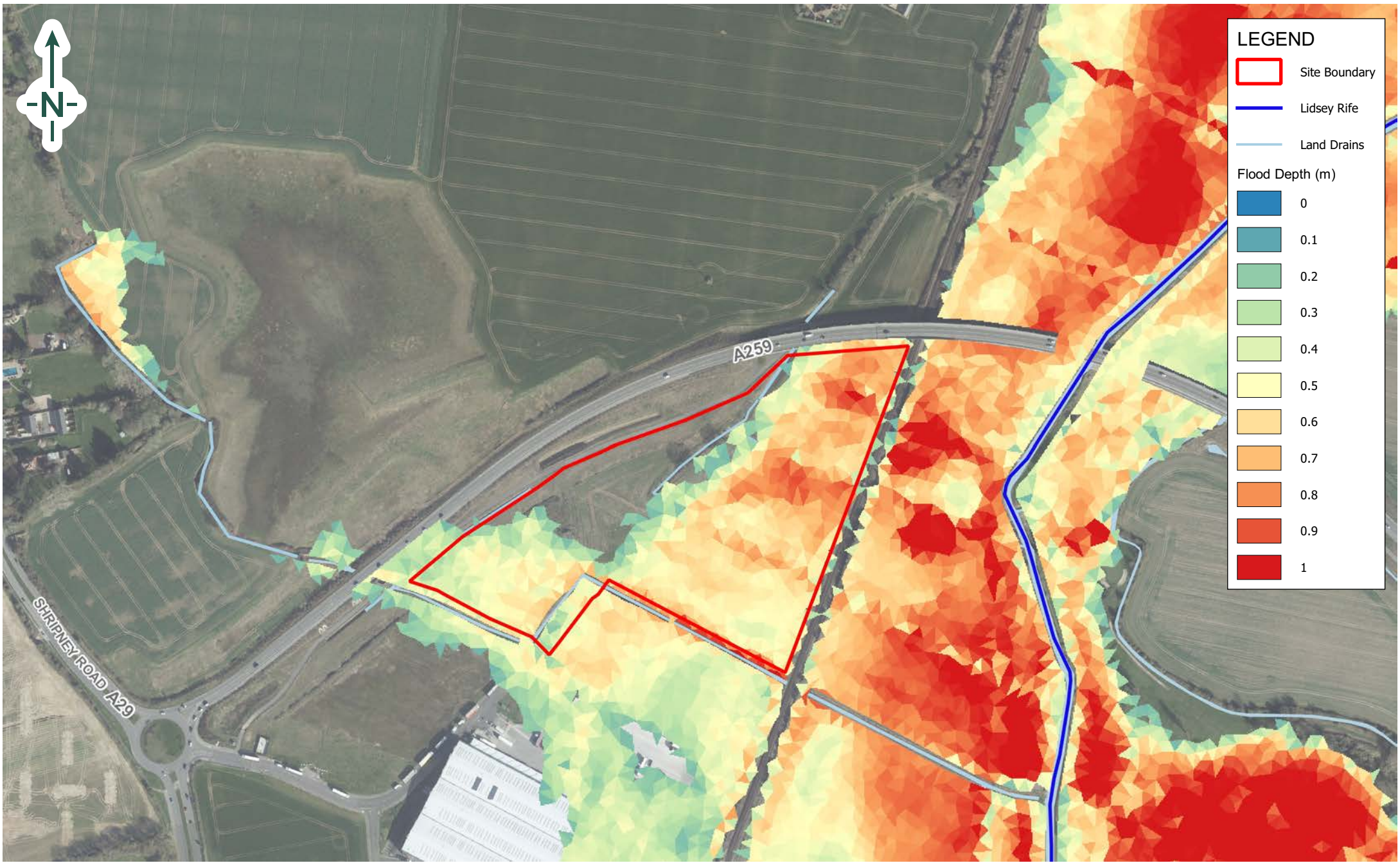
	0
	0.1
	0.2
	0.3
	0.4
	0.5
	0.6
	0.7
	0.8

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TITLE:
EA Modelled Flood Extent and Depths - 1% AEP + 45% CC (Defended)
Oldlands Farm, Bognor Regis, PO22 9NN

DRAWN BY: AB	SCALE (@A4): 1:4500	PROJECT NO: 20-1543.06
CHECKED BY: AP	REVISION: -	FIGURE NO: J3
DATE: 07 May 2021		



LEGEND

Site Boundary

Lidsey Rife

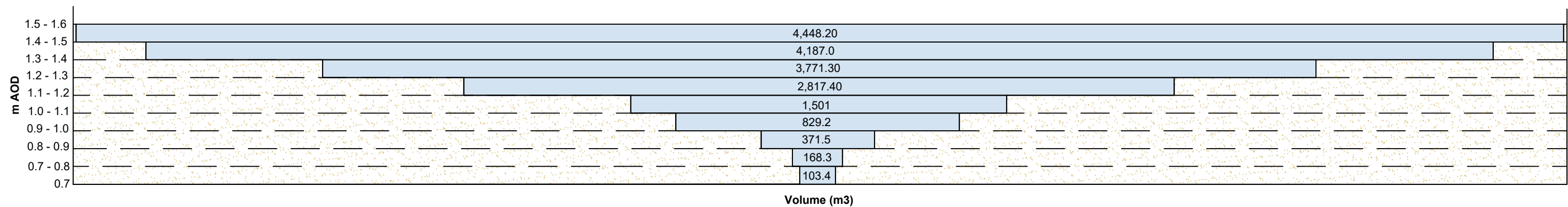
Land Drains

Flood Depth (m)

	0
	0.1
	0.2
	0.3
	0.4
	0.5
	0.6
	0.7
	0.8
	0.9
	1

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Appendix K – Flood Compensatory Storage Cross Section



NOTES

All dimensions in cubic meters and all levels in metres above ordnance datum unless shown otherwise

The cross sectional drawing and FCS design is indicative only and should be refined during the detailed design stage as the development progresses and the design evolves.

Appendix L – Culvert Assessment Calculations

Calculated by:	Anoop Bains
Site name:	Oldland Farm
Site location:	Bognor Regis

This is an estimation of the greenfield runoff rates that are used to meet normal best practice criteria in line with Environment Agency guidance "Rainfall runoff management for developments", SC030219 (2013), the SuDS Manual C753 (Ciria, 2015) and the non-statutory standards for SuDS (Defra, 2015). This information on greenfield runoff rates may be the basis for setting consents for the drainage of surface water runoff from sites.

Site Details

Latitude:	50.80835° N
Longitude:	0.6598° W
Reference:	15784952
Date:	Mar 30 2021 15:57

Runoff estimation approach

IH124

Site characteristics

Total site area (ha):	6.28
-----------------------	------

Methodology

Q _{BAR} estimation method:	Calculate from SPR and SAAR
SPR estimation method:	Calculate from SOIL type

Soil characteristics

	Default	Edited
SOIL type:	3	3
HOST class:	N/A	N/A
SPR/SPRHOST:	0.37	0.37

Hydrological characteristics

	Default	Edited
SAAR (mm):	720	720
Hydrological region:	7	7
Growth curve factor 1 year:	0.85	0.85
Growth curve factor 30 years:	2.3	2.3
Growth curve factor 100 years:	3.19	3.19
Growth curve factor 200 years:	3.74	3.74

Notes

(1) Is $Q_{\text{BAR}} < 2.0 \text{ l/s/ha}$?

When Q_{BAR} is $< 2.0 \text{ l/s/ha}$ then limiting discharge rates are set at 2.0 l/s/ha .

(2) Are flow rates $< 5.0 \text{ l/s}$?

Where flow rates are less than 5.0 l/s consent for discharge is usually set at 5.0 l/s if blockage from vegetation and other materials is possible. Lower consent flow rates may be set where the blockage risk is addressed by using appropriate drainage elements.

(3) Is $\text{SPR/SPRHOST} \leq 0.3$?

Where groundwater levels are low enough the use of soakaways to avoid discharge offsite would normally be preferred for disposal of surface water runoff.

Greenfield runoff rates

	Default	Edited
Q _{BAR} (l/s):	18.65	18.65
1 in 1 year (l/s):	15.85	15.85
1 in 30 years (l/s):	42.88	42.88
1 in 100 year (l/s):	59.48	59.48
1 in 200 years (l/s):	69.73	69.73

This report was produced using the greenfield runoff tool developed by HR Wallingford and available at www.uksuds.com. The use of this tool is subject to the UK SuDS terms and conditions and licence agreement, which can both be found at www.uksuds.com/terms-and-conditions.htm. The outputs from this tool are estimates of greenfield runoff rates. The use of these results is the responsibility of the users of this tool. No liability will be accepted by HR Wallingford, the Environment Agency, CEH, Hydrosolutions or any other organisation for the use of this data in the design or operational characteristics of any drainage scheme.

Input Data:

Area: 0.75

SAAR: 720

SPR: 0.4

QBAR: 18.65

Hydrometric Area: 7

**Results**

Pipe Size (mm)	150	225	300	450	600	750	900	1200	1500
Gradient (m/m) (S)	0.0067	0.0044	0.0033	0.0022	0.0017	0.0013	0.0011	0.0008	0.000667
Area (m2)	0.02	0.04	0.07	0.16	0.28	0.44	0.64	1.13	1.77
Perimeter (m)	0.47	0.71	0.94	1.41	1.88	2.36	2.83	3.77	4.71
R	0.0375	0.05625	0.075	0.1125	0.15	0.1875	0.225	0.3	0.375
Q	0.01	0.03	0.05	0.12	0.22	0.35	0.52	0.98	1.58
V	0.61	0.65	0.68	0.73	0.77	0.80	0.82	0.86	0.90
Capacity	No Capacity	No Capacity	No Capacity	No Capacity	No Capacity	No Capacity	No Capacity	Capacity	Capacity

Box Culvert Height (mm)	0.5	0.75	0.5	0.75	0.625	1	0.75	1.25	1.25
Box Culvert Width (mm)	1	1	1.25	1.25	1.375	1.375	1.5	1.7	1.5
Gradient (m/m) (S)	0.0022	0.0022	0.0022	0.0017	0.0017	0.0017	0.0017	0.0013	0.0013
Area (m2)	0.50	0.75	0.63	0.94	0.86	1.38	1.13	2.13	1.88
Perimeter (m)	3.00	3.50	3.50	4.00	4.00	4.75	4.50	5.90	5.50
R	0.17	0.21	0.18	0.23	0.21	0.29	0.25	0.36	0.34
Q	0.48	0.84	0.62	0.97	0.84	1.64	1.22	2.62	2.23
V	0.95	1.13	1.00	1.03	0.98	1.19	1.08	1.23	1.19
Capacity	No Capacity	No Capacity	No Capacity	Capacity	No Capacity	Capacity	Capacity	Capacity	Capacity