



MetroWest+

Portishead Branch Line (MetroWest Phase 1)

TR040011

Applicant: North Somerset District Council

6.25, Environmental Statement, Volume 4, Appendix 17.1, Flood Risk Assessment, Part 2 of 17

Appendix B Part 1 of 2, Environment Agency flood maps and modelled flood levels information (Portishead to Pill)

The Infrastructure Planning (Applications: Prescribed Forms and Procedure)

Regulations 2009, regulation 5(2)(a)

Planning Act 2008

Author: CH2M



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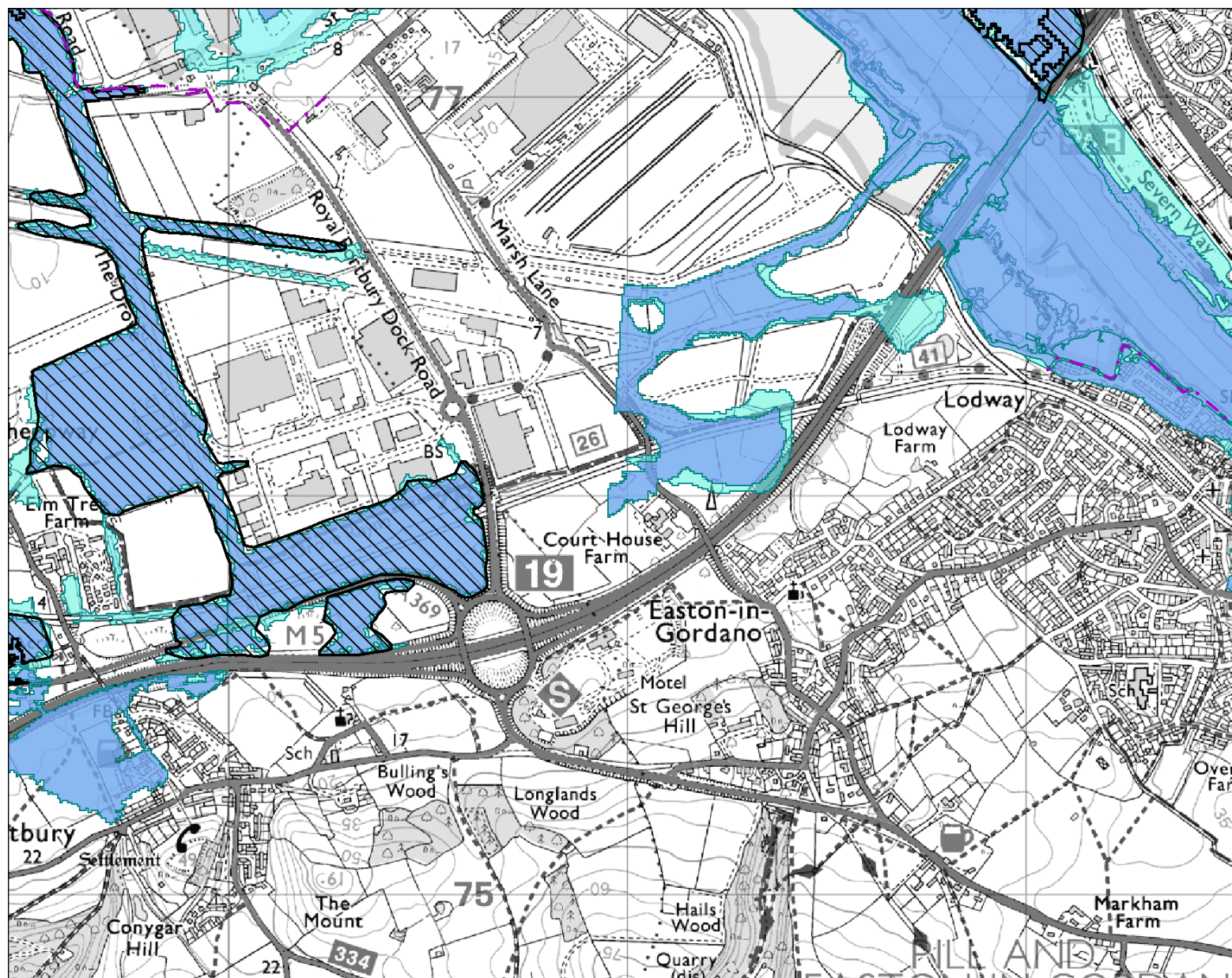
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Document history

Project	Portishead Branch Line (MetroWest Phase 1) Development Consent Order Scheme
Planning Inspectorate Scheme Reference	TR040011
Volume and Application Document Reference	6, 6.25
Document title	Environmental Statement, Volume 4, Appendix 17.1, Flood Risk Assessment, Part 2 of 17 Appendix B Part 1 of 2, Environment Agency flood maps and modelled flood levels information (Portishead to Pill)
Regulation Number	Regulation 5(2)(a)
Applicant	North Somerset District Council
Lead Author	RB at CH2M

Version	Date	Status of Version
Rev: 01	12/11/19	Application Issue

SW/6012 - map centred on ST 51000 76000 - created 02/05/2014



Scale 1:15,000



Flood Map for Planning (Rivers and Sea)

- Flood Map - Defences
- Areas Benefiting from Flood Defences
- Flood Map - Flood Storage Areas
- Flood Map - Flood Zone 3
- Flood Map - Flood Zone 2

Flood Map for Planning (Rivers and Sea) (assuming no defences)

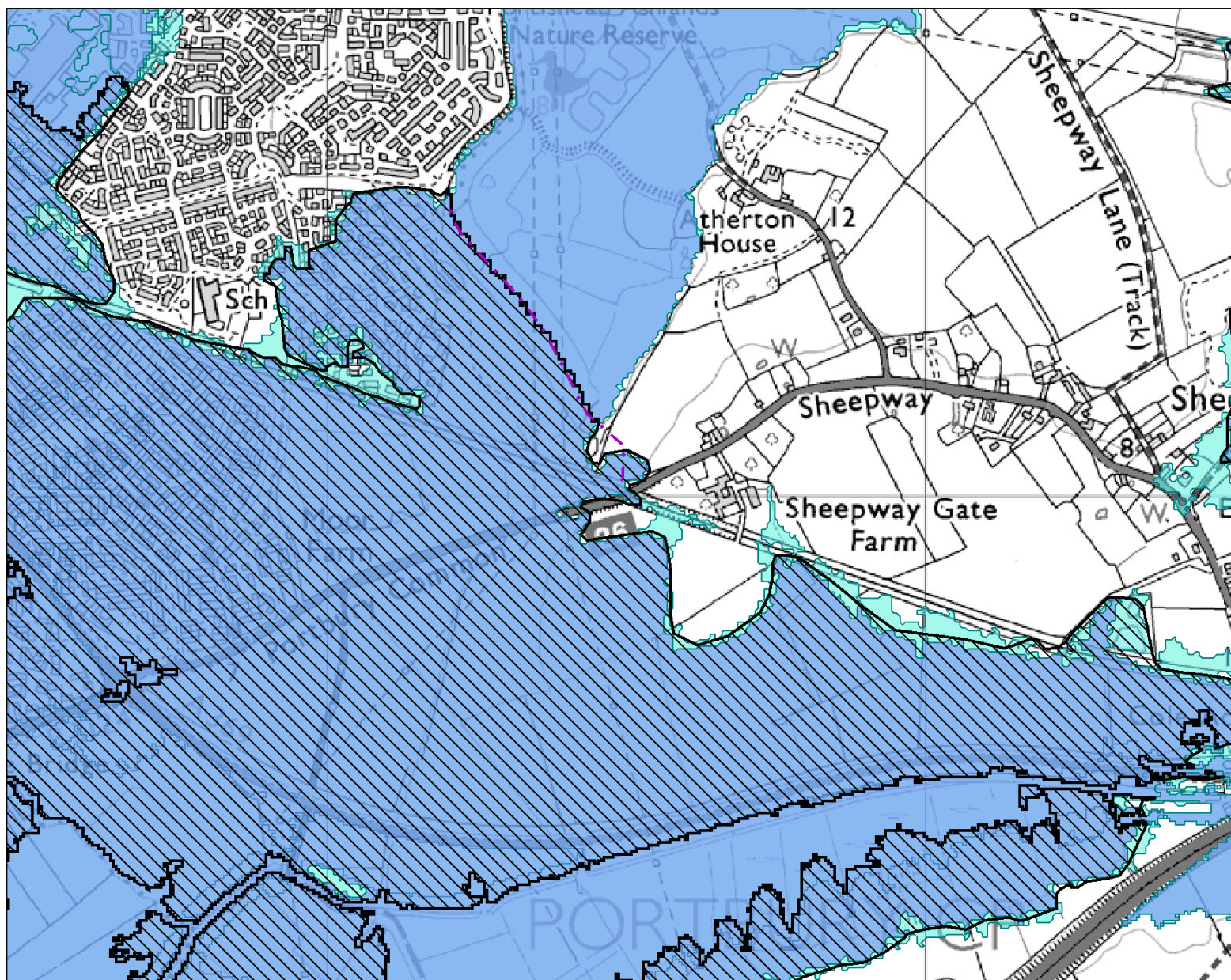
Flood Zone 3 shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
- or from a river with a 1 in 100 or greater chance of happening each year.

Flood Zone 2 shows the extent of an extreme flood from rivers or the sea with up to a 1 in 1000 chance of occurring each year.

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SW/6012 - map centred on ST 48500 76000 - created 02/05/2014



Scale 1:10,001



Flood Map for Planning (Rivers and Sea)

- Flood Map - Defences
- Areas Benefiting from Flood Defences
- Flood Map - Flood Storage Areas
- Flood Map - Flood Zone 3
- Flood Map - Flood Zone 2

Flood Map for Planning (Rivers and Sea) (assuming no defences)

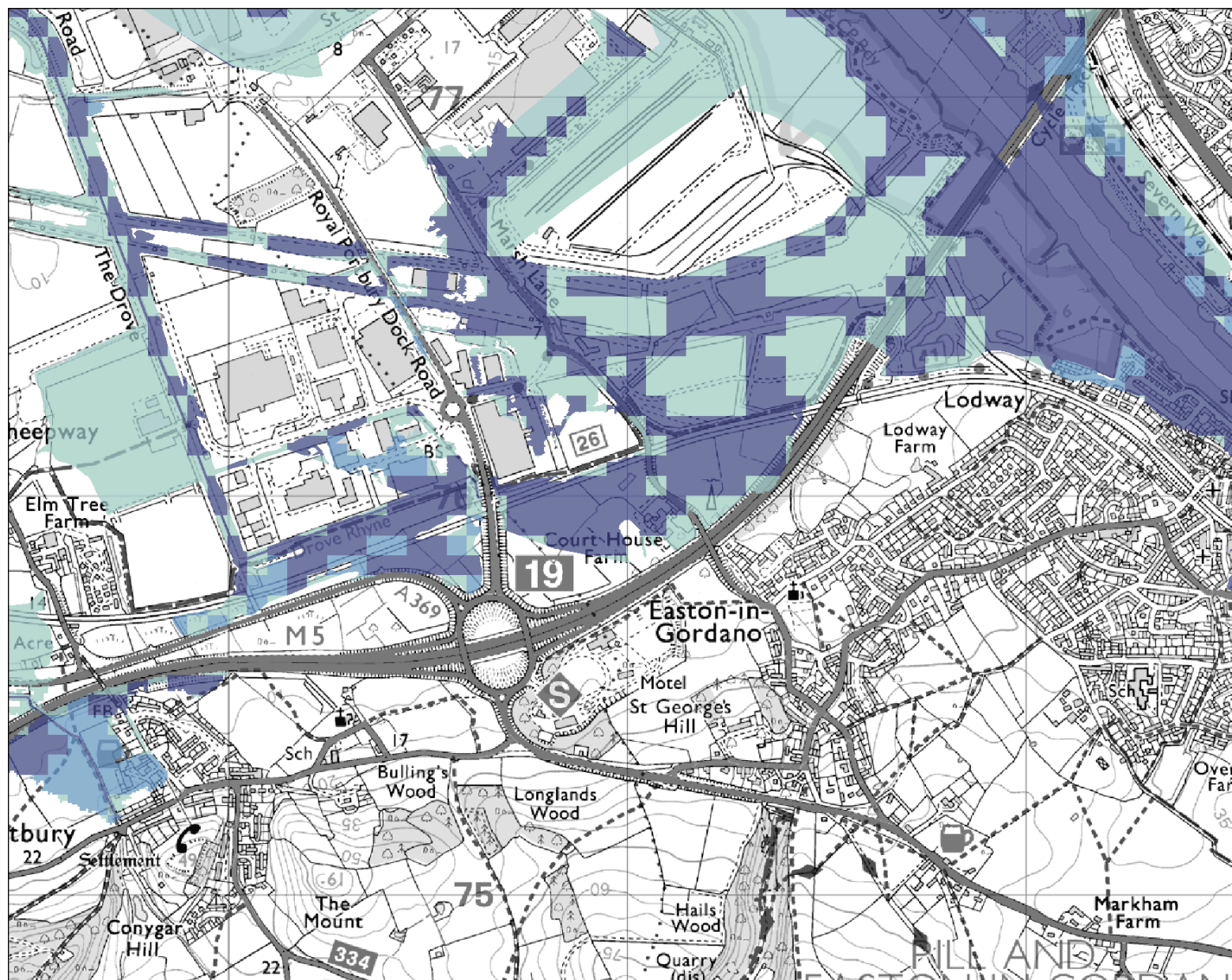
Flood Zone 3 shows the area that could be affected by flooding:

- from the sea with a 1 in 200 or greater chance of happening each year
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SW/6012 - map centred on ST 51000 76000 - created 02/05/2014

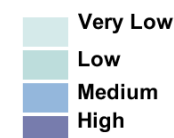


Scale 1:15,000



Likelihood of Flooding from Rivers and the Sea

National Flood Risk Assessment (NaFRA)



Likelihood of Flooding from Rivers and the Sea (taking into account defences)

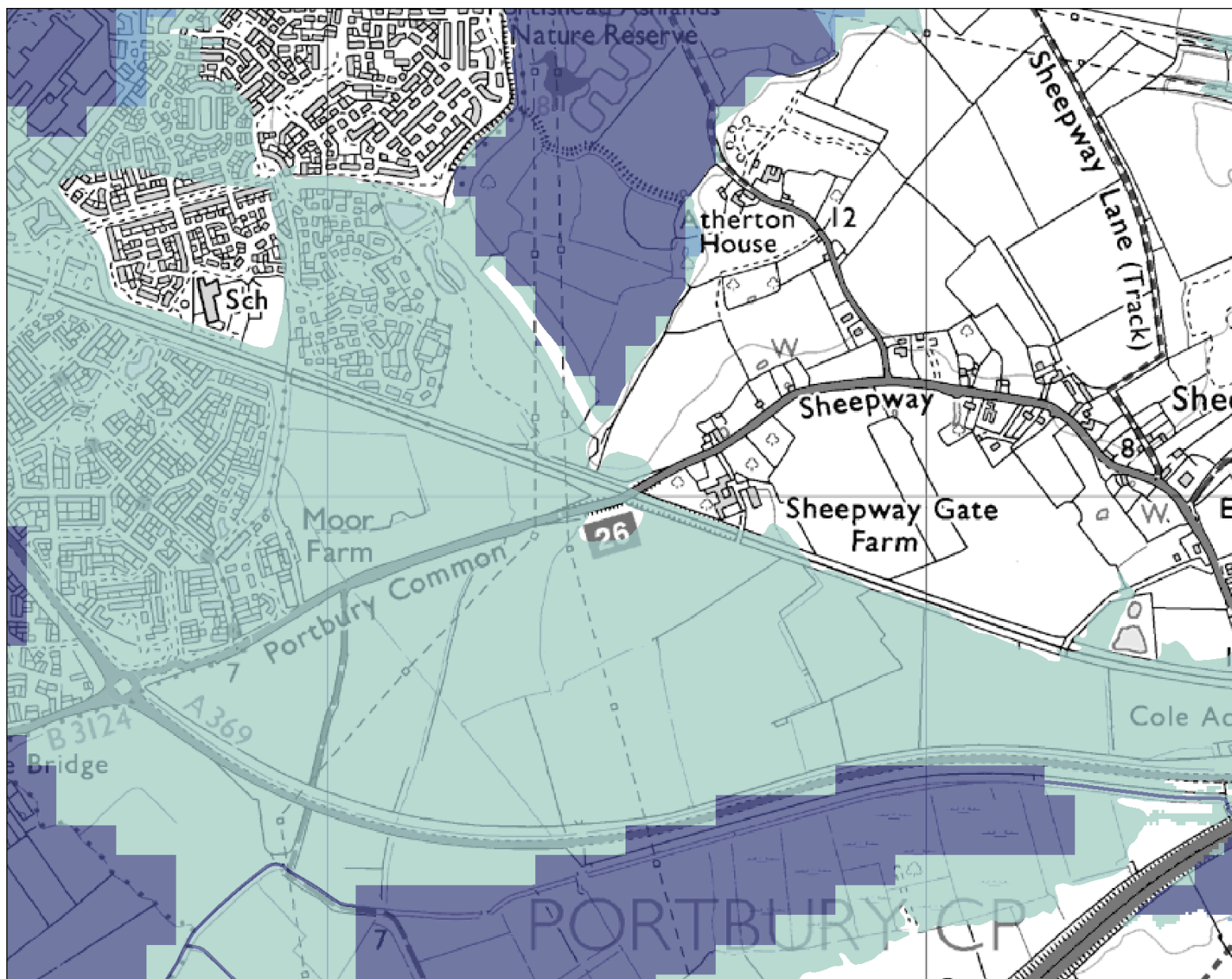
- High: Greater than or equal to 1 in 30 (3.3%) chance in any given year
- Medium: Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance in any given year.
- Low: Less than 1 in 100 (1%) but greater than or equal to 1 in 1,000 (0.1%) chance in any given year
- Very Low: Less than 1 in 1,000 (0.1%) chance in any given year

This information is shown on the Risk of Flooding from Rivers & the Sea map on our website.

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SW/6012 - map centred on ST 48500 76000 - created 02/05/2014

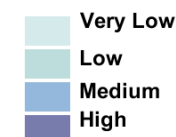


Scale 1:10,001



Likelihood of Flooding from Rivers and the Sea

National Flood Risk Assessment (NaFRA)



Likelihood of Flooding from Rivers and the Sea (taking into account defences)

- High: Greater than or equal to 1 in 30 (3.3%) chance in any given year
- Medium: Less than 1 in 30 (3.3%) but greater than or equal to 1 in 100 (1%) chance in any given year.
- Low: Less than 1 in 100 (1%) but greater than or equal to 1 in 1,000 (0.1%) chance in any given year
- Very Low: Less than 1 in 1,000 (0.1%) chance in any given year

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Scale: 1:30,000



Legend

Recorded flood outline

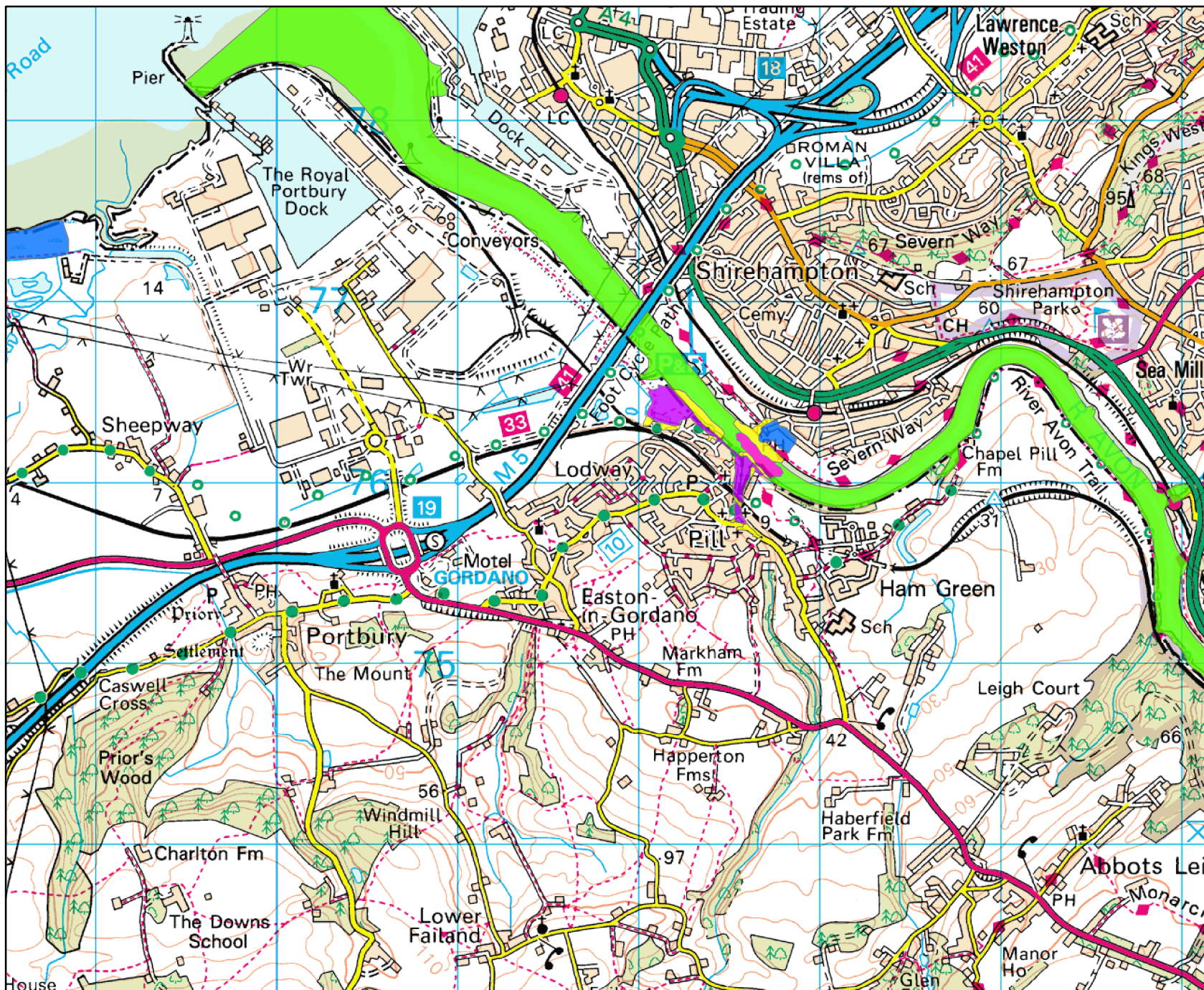
Start date

- █ 03/06/1982
- █ 04/12/1960
- █ 10/02/1989
- █ 13/12/1981
- █ 26/02/1990

Historic Flood Events

Please see the attached sheet for more information on the individual flood events, such as: dates, source and cause of flooding.

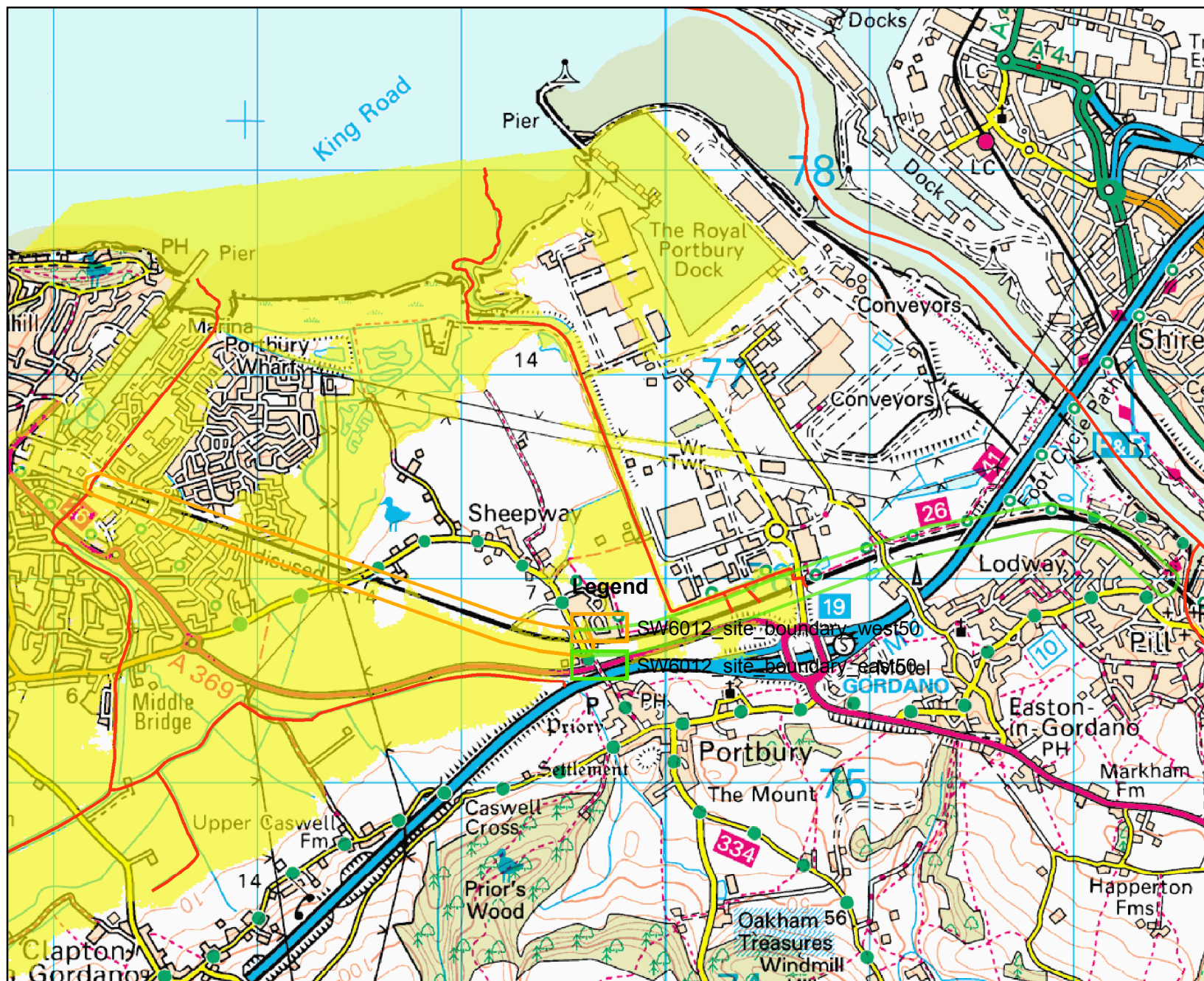
These events and outlines are taken from our Historic Flood Records. We cannot guarantee that it is an exhaustive list of all past flood events in this location.



SW6012

Start Date	End Date	Flood Event Code	Name	Comments	Source of Flooding	Cause of Flooding
04/12/1960	05/12/1960	22444	EA112_Clifton_Suspension_Bristol	Historic flood map ST57SE shows Avon just out of bank from Clifton Suspension Bridge to M5 road bridge. No record of Properties affected.	main river	channel capacity exceeded (no raised defences)
04/12/1960	05/12/1960	22287	EA112_Avon_M5_Avonmouth	Visual Historic Map ST57NW shows minor flooding from from around M5 to Avonmouth, no record of flooding to Industrial and or Residential properties.	main river	channel capacity exceeded (no raised defences)
13/12/1981	13/12/1981	26073	EA112_Avon_Shirehampton_1981	Bristol City Engineers report reported location of properties flooded. Ref BARA flood event file 008	main river	channel capacity exceeded (no raised defences)
13/12/1981	15/12/1981	25427	EA112_Coastal_Portbury_1981	Extent of flooding of land and Paper Mill/paper bag factory is based on engineers site visit report and flood event outline of the 1981 Flood Event at the time.	unknown	overtopping of defences
03/06/1982	03/06/1982	15900	EA112_Tidal_Shirehampton_Station Road	Bristol City engineer report indicated properties including The Lamplighters PH flooded in Station Road	main river	channel capacity exceeded (no raised defences)
10/02/1989	11/02/1989	26368	EA112_Avon_Pill_1989	Drawing 2011/11/004 located in BARA Flood Event File 010 and CDView, shows the extent of the flooding. Note that only 3 properties were confirmed as flooded but numerous others indicated as vulnerable	main river	overtopping of defences
26/02/1990	27/02/1990	26380	EA112_Feb_Avon_Pill_1990	Drawing 2011/11/043 identifies the areas of Pill - Avon Road, Mariners Parade, Pump Square, Bank Place and Watchhouse Road identified as flooded.	main river	overtopping of defences
26/02/1990	28/02/1990	24853	EA112_PortburyDitch_Portishead	Consultant report indicated extent of flooding including flood levels at no's 23 and 24 Victoria Square. File Ref Portbury Ditch catchment box	main river	channel capacity exceeded (no raised defences)
26/02/1990	27/02/1990	24854	EA112_Feb_Avon_Shirehampton	Drawing 2011/11/043 identifies properties flooded in Station Road plus the Lamplighters PH at Shirehampton, Bristol following NRA staff flood reconnaissance..	main river	overtopping of defences

0.1% AEP (Un defended) Tidal Depth Grid centred on Portbury (Ref SW/6012) created on 27/05/2014



Scale: 1:27,307



Legend

- SW6012_site_boundary_west50
- SW6012_site_boundary_east50
- Main River

Portbury_Q1000_Un defended_D.asc

Value

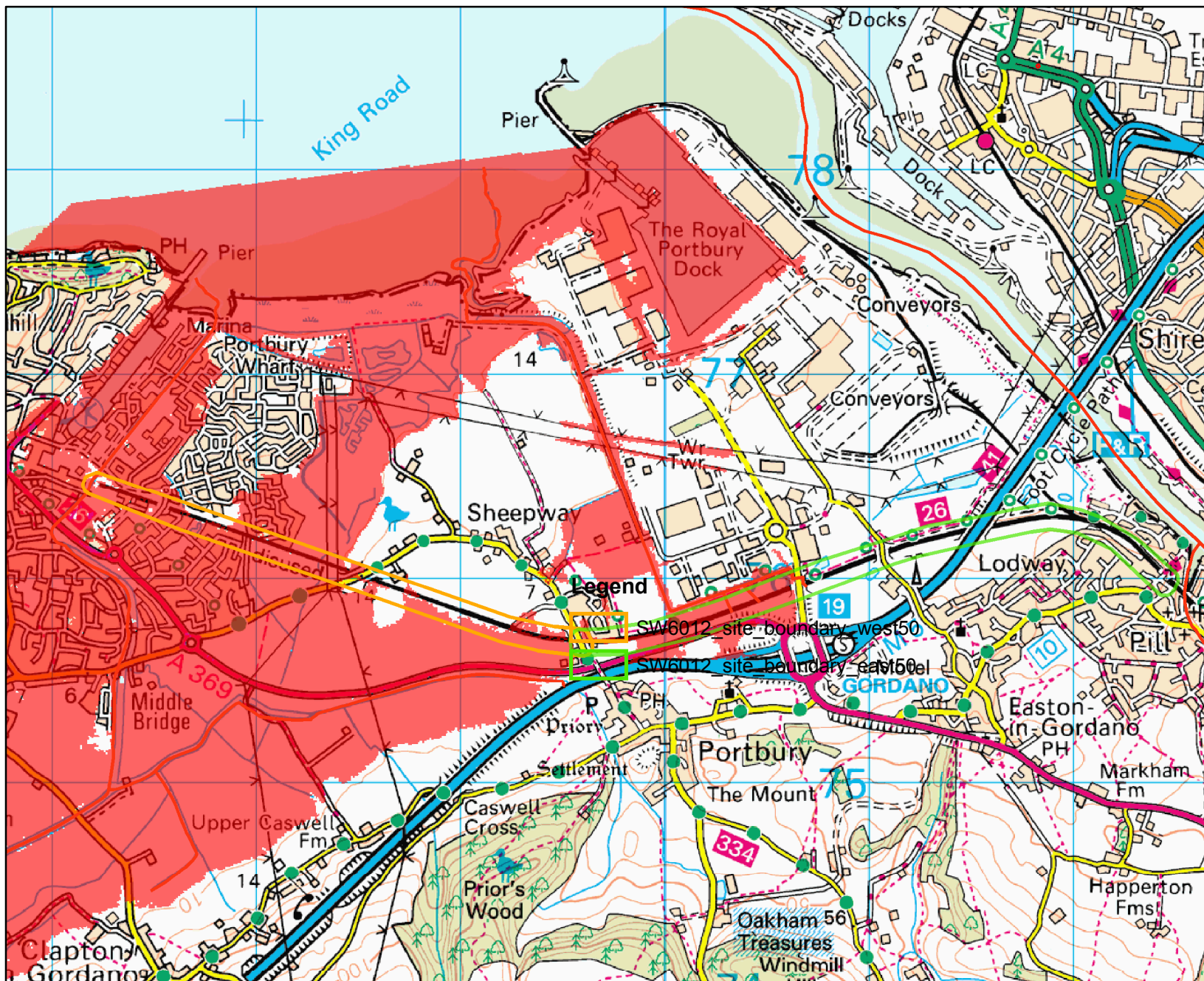
- High : 3.40 m
- Low : 1.17 m

0.1% AEP Tidal Depths

These depths are taken from our North Coast Tidal Mapping study 2012 and are based on 2008 tidal extreme water levels which have now been superseded by "Coastal Flood Boundary Conditions for UK Mainland and Islands", 2011. The modelling is based on a 50m grid and is fit for purpose for Flood Zone mapping, however it should only be used as an indicative guide to flood depth inundation for site specific FRAs.

AEP = Annual Exceedance Probability
- e.g. 0.1% AEP has a 0.1% chance of occurring in any one year (1:1000 chance)

0.1% AEP (Un defended) Tidal Level Grid centred on Portbury (Ref SW/6012) created on 27/05/2014



Scale: 1:27,307



Legend

- SW6012_site_boundary_west50
- SW6012_site_boundary_east50
- Main River

Portbury_Q1000_Un defended_H.asc

Value

- High : 3.40 m
- Low : 1.17 m

0.1% AEP Tidal Levels

These depths are taken from our North Coast Tidal Mapping study 2012 and are based on 2008 tidal extreme water levels which have now been superseded by "Coastal Flood Boundary Conditions for UK Mainland and Islands", 2011. The modelling is based on a 50m grid and is fit for purpose for Flood Zone mapping, however it should only be used as an indicative guide to flood depth inundation for site specific FRAs.

AEP = Annual Exceedance Probability
- e.g. 0.1% AEP has a 0.1% chance of occurring in any one year (1:1000 chance)

0.5% AEP (Defended) Tidal Depth Grid centred on Portbury (Ref SW/6012) created on 27/05/2014



Scale: 1:27,307



Legend

- SW6012_site_boundary_west50
- SW6012_site_boundary_east50
- Main River

Portbury 0.5% AEP Defended Tide_D.a Value

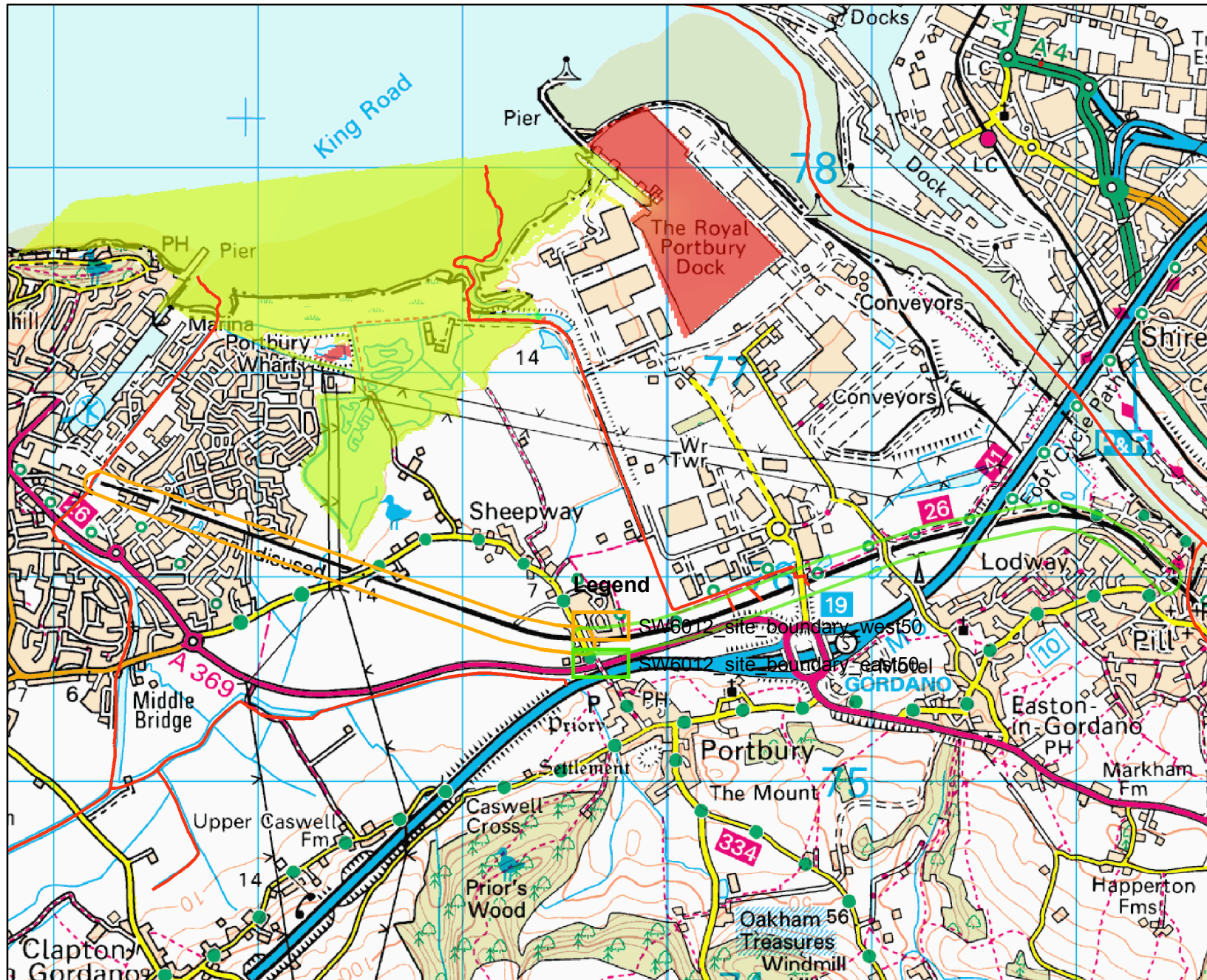
- High : 23.43 m
- Low : 0 m

0.5% AEP Tidal Depths

These depths are taken from our North Coast Tidal Mapping study 2012 and are based on 2008 tidal extreme water levels which have now been superseded by "Coastal Flood Boundary Conditions for UK Mainland and Islands", 2011. The modelling is based on a 50m grid and is fit for purpose for Flood Zone mapping, however it should only be used as an indicative guide to flood depth inundation for site specific FRAs.

AEP = Annual Exceedance Probability
- e.g. 0.5% AEP has a 0.5% chance of occurring in any one year (1:200 chance)

0.5% AEP (Defended) Tidal Level Grid centred on Portbury (Ref SW/6012) created on 27/05/2014



Scale: 1:27,307



Legend

- SW6012_site_boundary_west50
- SW6012_site_boundary_east50
- Main River

Portbury 0.5% AEP Defended Tide_H.a Value

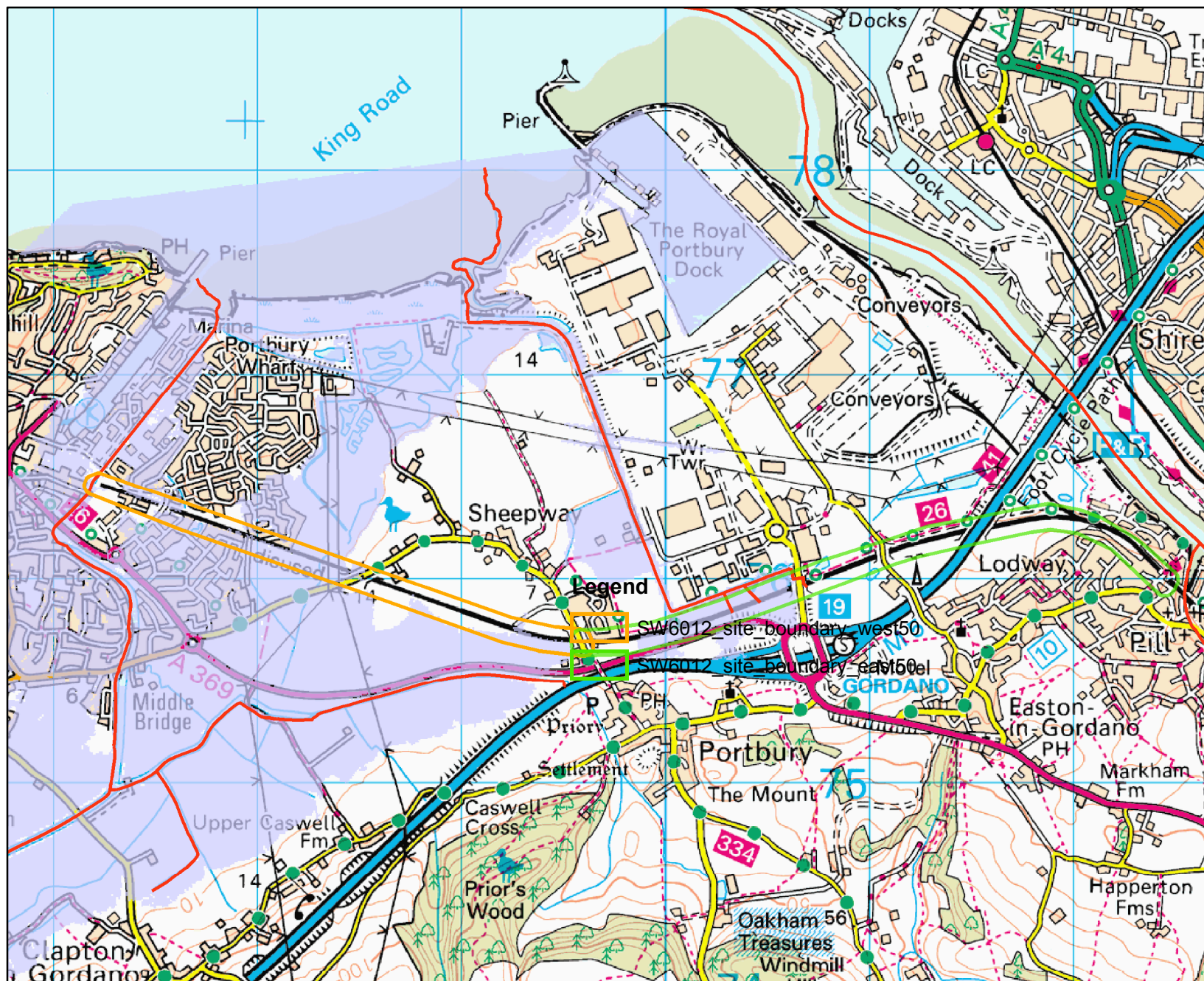
- High : 10.61 m
- Low : 2.33 m

0.5% AEP Tidal Levels

These depths are taken from our North Coast Tidal Mapping study 2012 and are based on 2008 tidal extreme water levels which have now been superseded by "Coastal Flood Boundary Conditions for UK Mainland and Islands", 2011. The modelling is based on a 50m grid and is fit for purpose for Flood Zone mapping, however it should only be used as an indicative guide to flood depth inundation for site specific FRAs.

AEP = Annual Exceedance Probability
- e.g. 0.5% AEP has a 0.5% chance of occurring in any one year (1:200 chance)

0.5% AEP (Undefended) Tidal Depth Grid centred on Portbury (Ref SW/6012) created on 27/05/2014



Scale: 1:27,307



Legend

- SW6012_site_boundary_west50
- SW6012_site_boundary_east50
- Main River

Portbury_Q200_Undefended_D.asc

Value

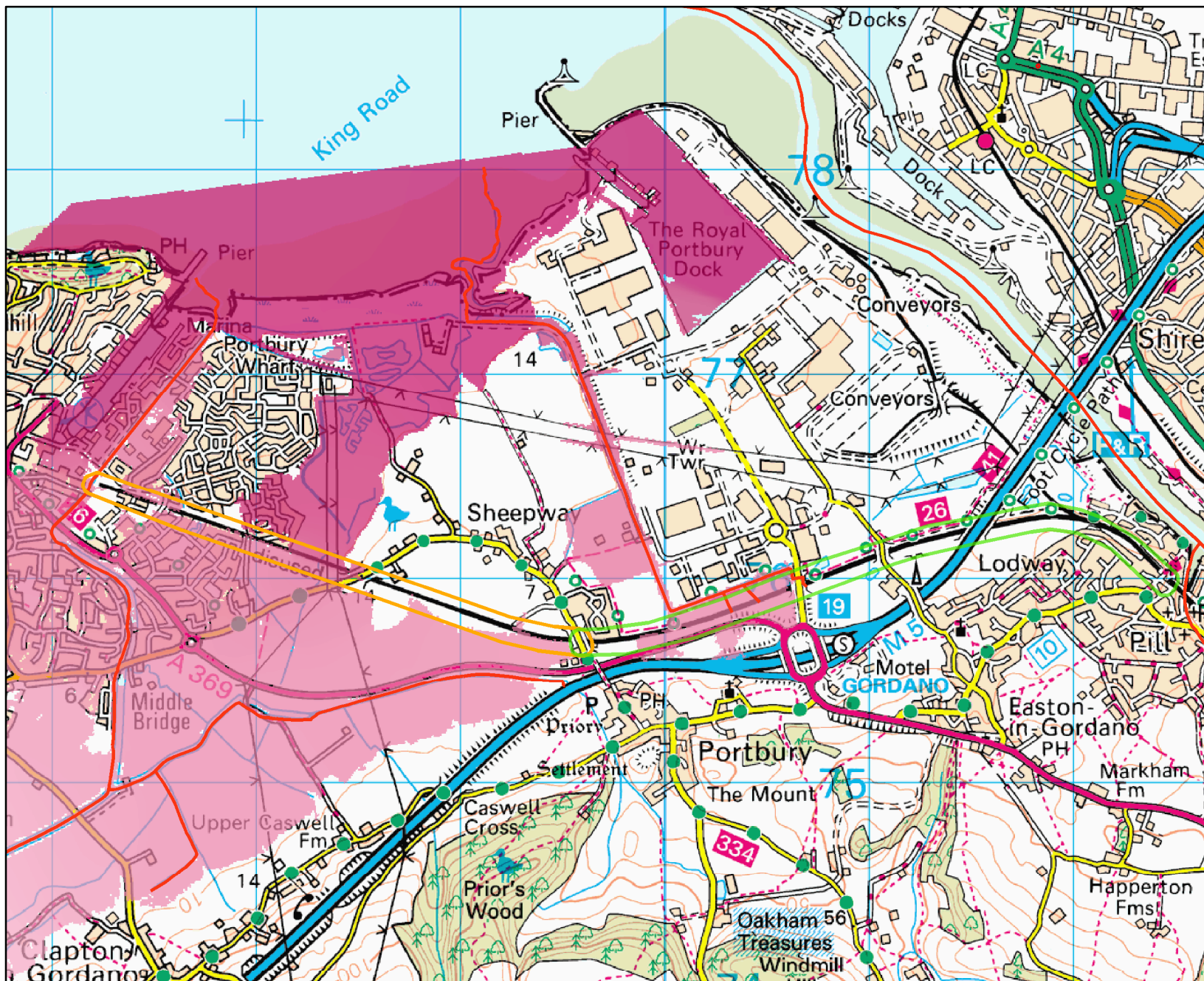
- High : 3.40 m
- Low : 1.18 m

0.5% AEP Tidal Depths

These depths are taken from our North Coast Tidal Mapping study 2012 and are based on 2008 tidal extreme water levels which have now been superseded by "Coastal Flood Boundary Conditions for UK Mainland and Islands", 2011. The modelling is based on a 50m grid and is fit for purpose for Flood Zone mapping, however it should only be used as an indicative guide to flood depth inundation for site specific FRAs.

AEP = Annual Exceedance Probability
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0.5% AEP (Un defended) Tidal Level Grid centred on Portbury (Ref SW/6012) created on 27/05/2014



Scale: 1:27,307



Legend

- SW6012_site_boundary_east50
- SW6012_site_boundary_west50
- Main River

Portbury_0.5%AEP_Un defended_Hase Value

- High : 9.15 m
- Low : 5.83 m

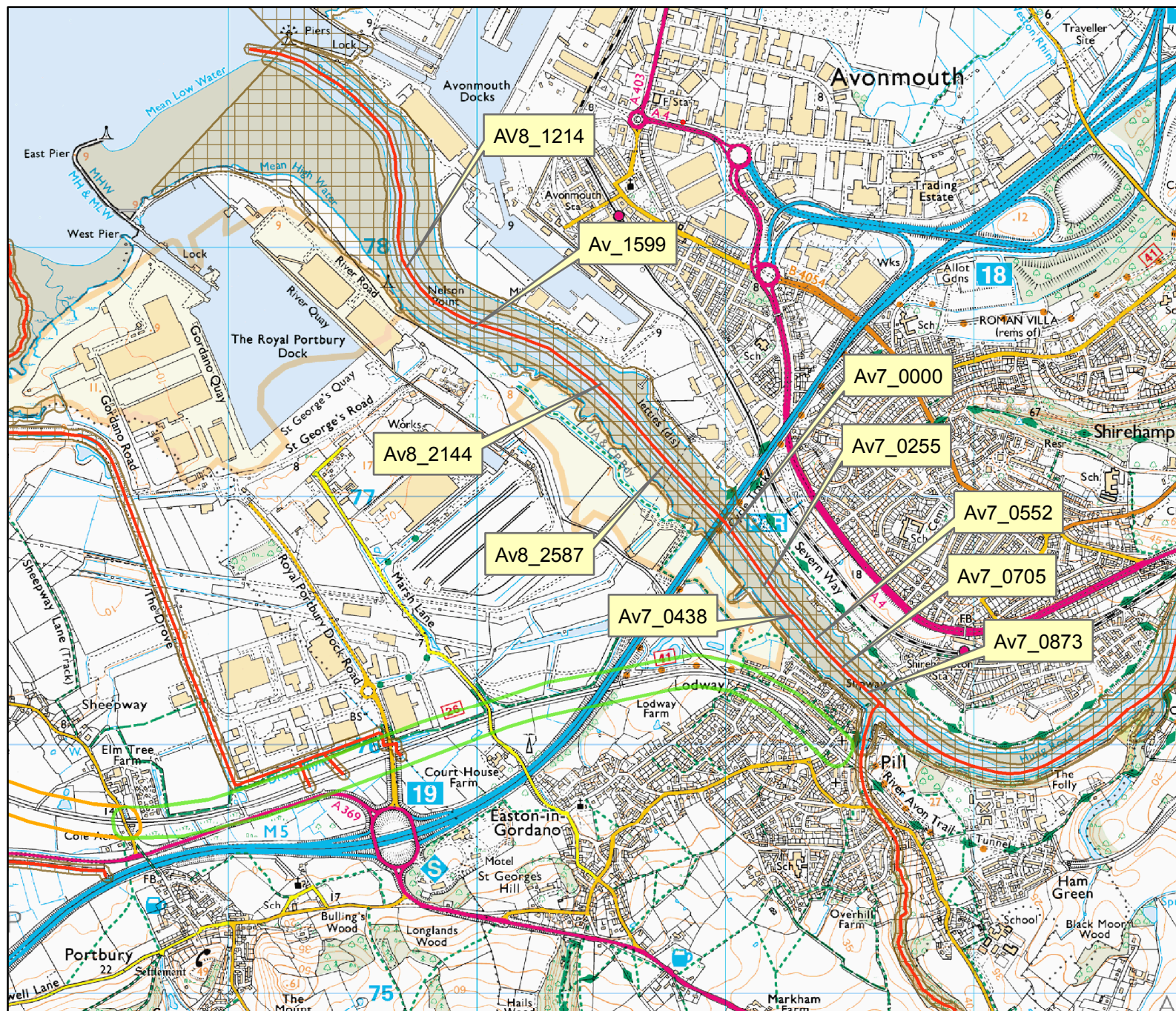
0.5% AEP Tidal Levels

These depths are taken from our North Coast Tidal Mapping study 2012 and are based on 2008 tidal extreme water levels which have now been superseded by "Coastal Flood Boundary Conditions for UK Mainland and Islands", 2011. The modelling is based on a 50m grid and is fit for purpose for Flood Zone mapping, however it should only be used as an indicative guide to flood depth inundation for site specific FRAs.

AEP = Annual Exceedance Probability
- e.g. 0.5% AEP has a 0.5% chance of occurring in any one year (1:200 chance)

WATERCOURS	NODE	Q20_FLO	Q20_LEV	Q20CC_FLO	Q20CC_LEV	Q75_FLO	Q75_LEV	Q100_FLO	Q100_LEV	Q100CC_FLO	Q100CC_LEV	X	Y
River Avon	Av7_0000	1033.61	7.10	1207.12	8.12	1083.49	7.11	1119.13	7.11	1258.43	8.11	352018	176853
River Avon	Av7_0255	1007.16	7.11	1177.34	8.13	1056.91	7.12	1091.45	7.12	1230.04	8.12	352165	176645
River Avon	Av7_0438	988.26	7.12	1156.44	8.14	1038.26	7.12	1071.52	7.13	1210.17	8.13	352283	176506
River Avon	Av7_0552	976.66	7.12	1143.36	8.14	1026.77	7.12	1059.11	7.13	1197.70	8.13	352374	176434
River Avon	Av7_0705	961.67	7.12	1126.46	8.14	1011.96	7.13	1043.09	7.13	1181.49	8.14	352464	176310
River Avon	Av7_0873	944.61	7.13	1107.23	8.15	994.31	7.13	1024.22	7.14	1161.67	8.14	352593	176200
River Avon	Av8_1214	1268.00	7.06	1460.46	8.06	1314.11	7.06	1353.80	7.06	1502.32	8.06	350706	177925
River Avon	Av8_1599	1207.86	7.06	1394.18	8.07	1253.67	7.07	1291.28	7.07	1438.50	8.07	350998	177675
River Avon	Av8_2144	1132.62	7.08	1313.06	8.09	1179.82	7.08	1215.16	7.08	1360.37	8.09	351499	177465
River Avon	Av8_2587	1075.67	7.09	1252.63	8.10	1124.45	7.10	1160.54	7.10	1301.91	8.10	351773	177112

WATERCOURS	NODE	Q100_FLO	Q100_LEV	Q1000_FLO	Q1000_LEV	TQ200_LEV	TQ1000_LEV	X	Y
River Avon	Av7_0000	1119.20	7.11	1223.65	7.11	9.14	9.46	352018	176853
River Avon	Av7_0255	1091.51	7.12	1197.91	7.11	9.15	9.47	352165	176645
River Avon	Av7_0438	1071.61	7.13	1179.79	7.12	9.15	9.47	352283	176506
River Avon	Av7_0552	1059.22	7.13	1168.83	7.12	9.15	9.47	352374	176434
River Avon	Av7_0705	1043.21	7.13	1154.89	7.13	9.15	9.47	352464	176310
River Avon	Av7_0873	1024.28	7.14	1134.87	7.13	9.15	9.47	352593	176200
River Avon	Av8_1214	1353.85	7.06	1506.75	7.06	9.12	9.44	350706	177925
River Avon	Av8_1599	1291.33	7.07	1463.31	7.06	9.12	9.44	350998	177675
River Avon	Av8_2144	1215.16	7.08	1317.36	7.08	9.13	9.45	351499	177465
River Avon	Av8_2587	1160.62	7.10	1263.48	7.09	9.14	9.46	351773	177112



Scale: 1:22,551



Legend

- SW6012_site_boundary_east50
- SW6012_site_boundary_west50
- Main River
- Bank Top ePlanning Tool

Modelled Flood Level Nodes

A table that references the node locations/unique identifiers is also attached, giving associated flood levels, NGRs and further information for the river channel and model.

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