

P507 - LAND WEST OF WARMINSTER, WILTSHIRE

MODELLING OF THE SOUTH WERE, WEST WERE AND THE WERE – NON-TECHNICAL SUMMARY

1. Introduction

- 1.1. A Flood Risk Assessment (FRA) was prepared by PFA Consulting Ltd in December 2014 in support of planning application reference 15/01800/OUT.
- 1.2. Since completion of the FRA additional information relating to the South and West Were has come to light. The Environment Agency's consultation response, dated 31 March 2015 (ref WX/2015/127525/01-L01) raised a "holding objection" to the planning application and stated the following:-

"For a site of this size, especially given the nature of the proposed development, we would expect to see a more comprehensive appraisal of flood risk arising from the ordinary watercourses (and any other identified source of flooding) in the vicinity of the site."
- 1.3. Additional hydraulic modelling of the South Were, West Were and The Were has been undertaken to address the Environment Agency's comments.

2. Modelling Method

- 2.1. An additional topographical survey of the watercourses was undertaken in June 2015 and the model was built using cross-sections from this survey. Floodplains were represented based on site survey information where available and LIDAR data in other areas.
- 2.2. Flow rates within the model were calibrated using the George Street Gauge downstream of the site.

3. Baseline Results

- 3.1. Flood outlines and depths for the 1 in 20 year, 1 in 100 year, 1 in 100 year + climate change and 1 in 1000 year events are contained in **Appendix 1**.
- 1 in 20 year results**
- 3.2. The results show that flooding from the South Were is limited to the extreme west of the site with shallow flood depths of 100mm or less. The part of the site affected is a proposed area of Public Open Space.
 - 3.3. No other parts of the application site are affected by the 1 in 20 year event.
- 1 in 100 year results**
- 3.4. For the 1 in 100 year event, the results show shallow flooding along the northern side of the South Were and on the western side of the West Were. Flood depths are mostly shallower than 100mm.

1 in 100 year + climate change results

- 3.5. With the increased flows to take account of climate change effects flooding along the northern side of the South Were extends further into the site. The extent of flooding to the east and west of the West Were is also increased. Flood depths are shallow (less than 100mm) within the application site.

1 in 1000 year results

- 3.6. Flood depths within the site are still shallow for the 1 in 1000 year event. Additional areas are affected along the northern side of the South Were and to the east of the West Were.

4. Mitigation Measures

- 4.1. The addition of the following features to the masterplan is proposed to reduce flood risk to the development and alleviate any negative offsite impacts:
- i. Defence bunds to protect vulnerable areas of the site from flooding,
 - ii. Culvert removal to reduce out of bank flow on the South Were, and,
 - iii. Two storage basins to attenuate additional flows caused by the above defences.
- 4.2. These proposals, and their impact on the flood outlines for a 1 in 100 year + climate change event, are shown in **Appendix 2**.
- 4.3. Flows in the South Were are reduced for all modelled return period events due to the additional floodwater storage offered by the South Were detention basin and bunds.
- 4.4. Small increases in peak flow in the West Were occur from the site boundary to 400m downstream of the site. The increases in peak flow are local and in bank and therefore have negligible impact.
- 4.5. Further downstream, at the confluence of the West Were with the Grovelands Way storage area and at the Bath Road Bridge, flows are reduced.

5. Conclusions

- 5.1. Baseline and mitigation modelling of the South and West Were has been undertaken.
- 5.2. Baseline modelling demonstrates that shallow flooding affects parts of the application site for the 1 in 100 year, 1 in 100 year + climate change and 1 in 1000 year events.
- 5.3. The mitigation measures proposed would protect the site from flooding and reduce flows in the South Were. The modelling indicates that the mitigation measures proposed on the West Were would lead to negligible increase in flows immediately downstream of the site. However, flows downstream of the confluence of the West Were with the Grovelands Way storage area would be reduced.
- 5.4. It is therefore concluded that the proposed mitigation measures would lead to an overall reduction in flood risk to the site itself and downstream of the site.



Legend

Baseline 5% AEP Dept

- 0.0
- 0.1
- 0.2
- 0.3
- 0.4
- 0.5
- 1D River Channel

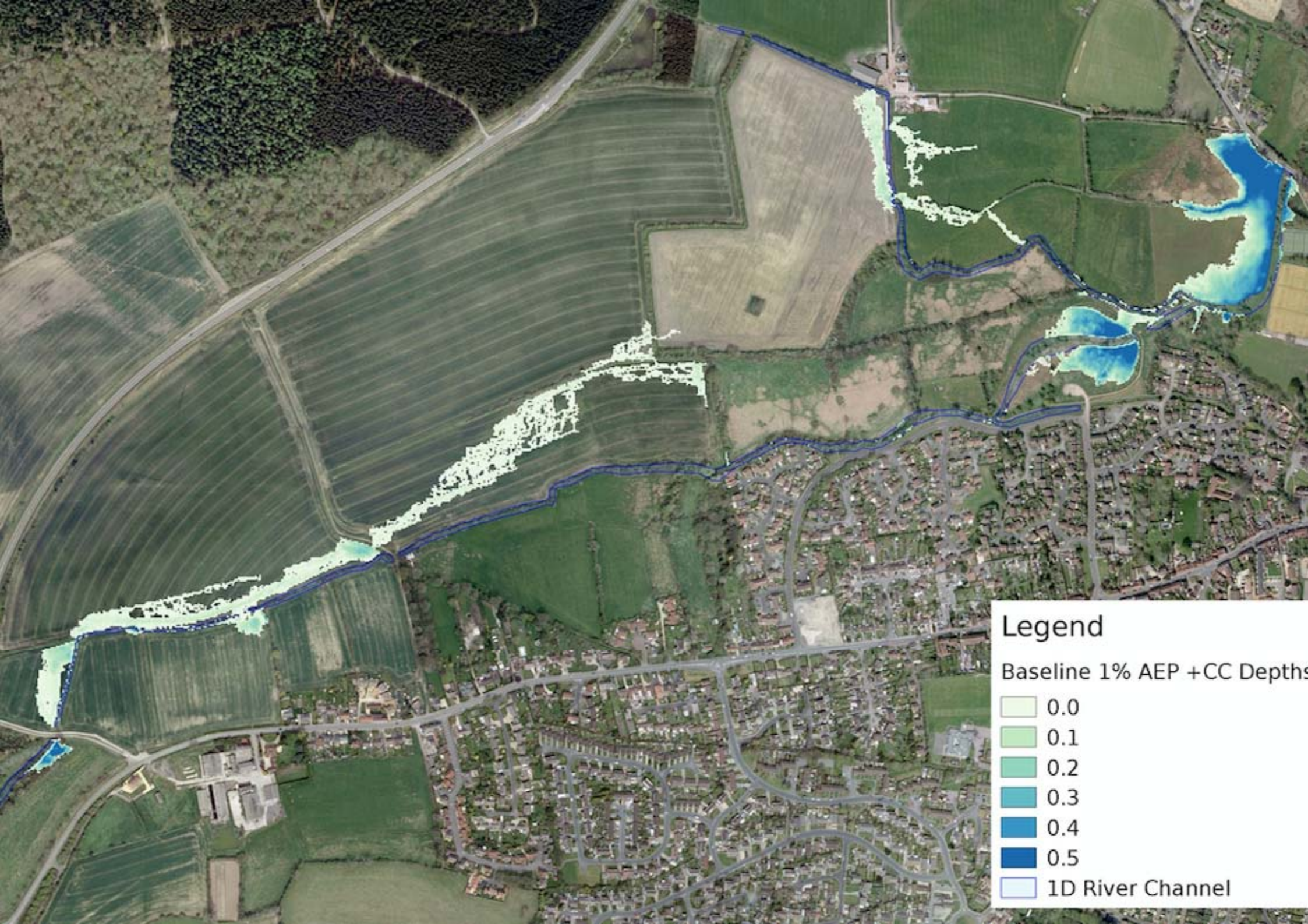


Legend

Baseline 1% AEP Depth

- 0.0
- 0.1
- 0.2
- 0.3
- 0.4
- 0.5

1D River Channel

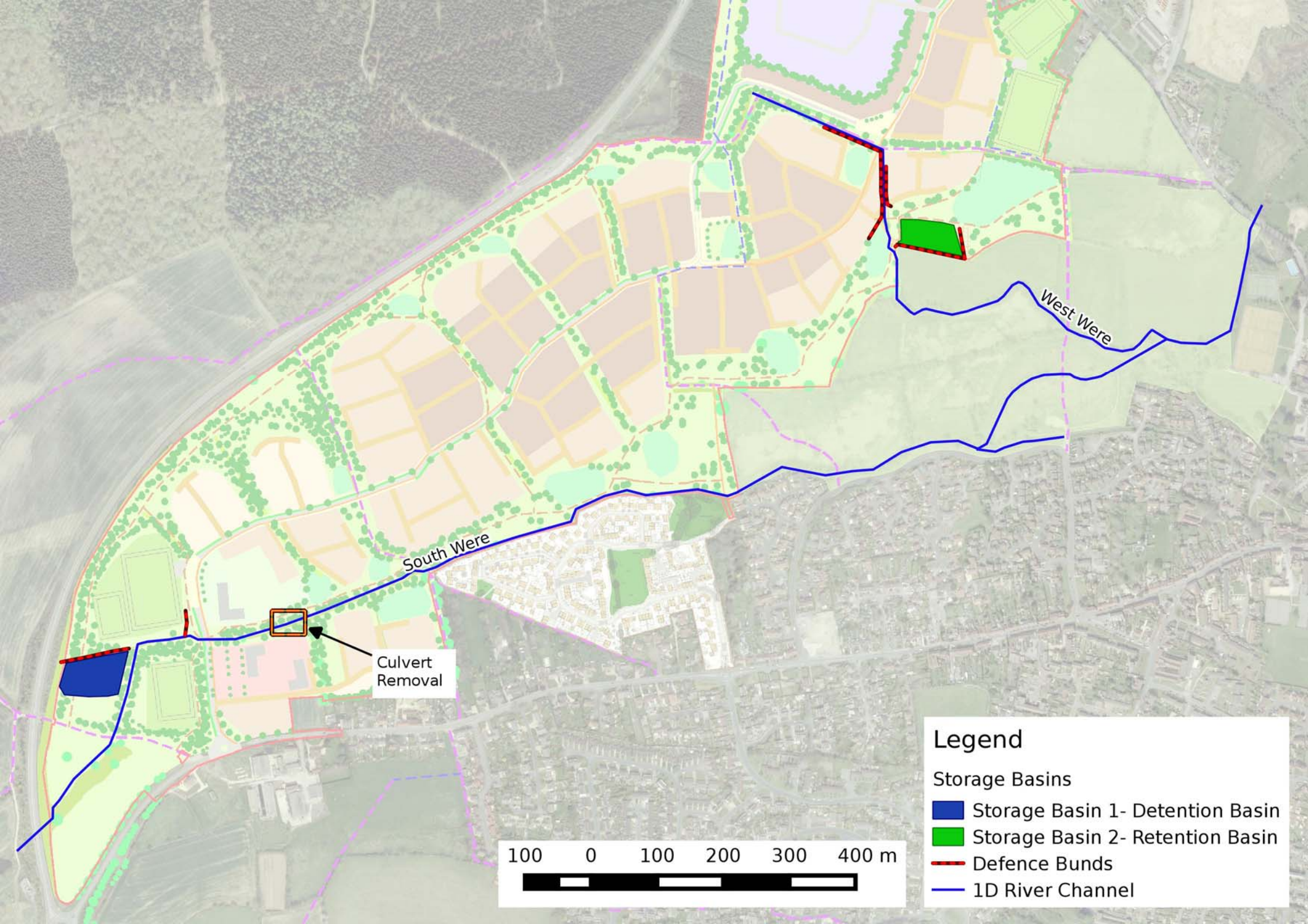




Legend

Baseline 0.1% AEP Depth

- 0.0
- 0.1
- 0.2
- 0.3
- 0.4
- 0.5
- 1D River Channel



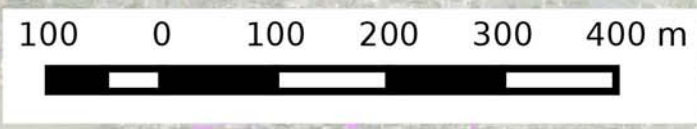
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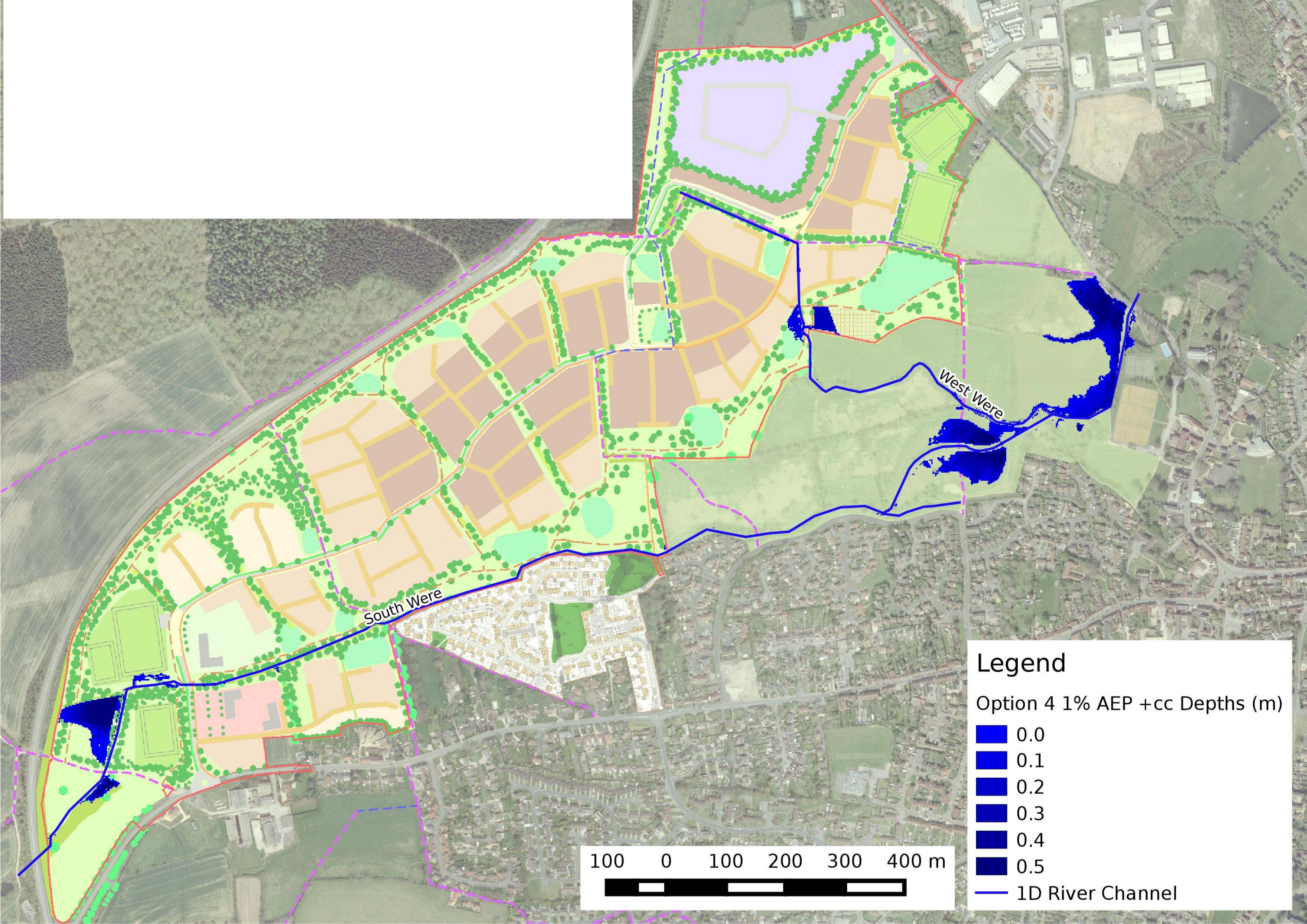
Storage Basins

- Storage Basin 1- Detention Basin
- Storage Basin 2- Retention Basin

Defence Bunds

1D River Channel





Legend

Option 4 1% AEP + cc Depths (m)

0.0
0.1
0.2
0.3
0.4
0.5

— 1D River Channel

