

Western Parkland City Authority
c/o NPC
Suite 204, 99 Alexander Street
CROWS NEST NSW 2065

15th November 2021

Attention: Mr Anthony Henry

Dear Anthony,

BRADFIELD MASTER PLAN FLOOD ADVISORY SERVICES STATE SIGNIFICANT DEVELOPMENT APPLICATION FOR THE FIRST BUILDING FLOOD ASSESSMENT

I refer to the Western Parkland City Authority's request for Advisian to undertake a flood assessment for the site and development proposed as the First Building for the new city of Bradfield in south-western Sydney. The flood assessment is required as supporting documentation for the State Significant Development Application (SSDA) for the First Building. I also refer to previous flood modelling for the Bradfield site which was completed by Advisian in March 2021 as part of our role in developing the Master Plan.

The TUFLOW model that was developed by Advisian for the previous modelling of the Bradfield site was updated and used to re-simulate the 1% AEP storm over the catchment. The results were used to determine the potential for the First Building site to be exposed to flooding or inundation from overland flows.

The results of this flood assessment are provided in the following sections.

1. Summary of Previous Flood Modelling

Advisian has previously developed a TUFLOW flood model for the Aerotropolis Core including the upstream catchments of Moore Gully and Thompsons Creek. This flood model also covers the site of the proposed First Building at the Bradfield City Centre. In March 2021, the flood model was used to simulate the 1% and 0.5% AEP design flood events, for both existing conditions and post-development conditions. It is noted that the post-development condition modelled in March 2021 was based on a site grading plan which was prepared for the Master Plan, but which is currently being revised.

The flood modelling results from the March 2021 simulations show that the proposed site of the First Building is unlikely to be inundated by the flooding of Moore Gully or Thompsons Creek, even in events as rare as the Probable Maximum Flood. However, the flood modelling results do show that the site is located in close proximity to some minor overland flow paths which drain to Thompsons Creek.

The 1% AEP flood model results for existing (pre-development) conditions are included within Appendix A.

2. TUFLOW Model Update

Advisian was provided with a design digital terrain model (DTM) that was developed by AECOM for the proposed site of the First Building. This design DTM was incorporated into the TUFLOW flood model to represent the post-development landform associated with the First Building development. The extent of the AECOM design DTM and the location of the First Building are shown in Figure 1. It is noted that the grading plan for the entire Bradfield site is still in development.

The TUFLOW model was developed using a 0.5 metre grid based on LiDAR provided by the Western Parkland City Authority (WPCA) to define the landform surrounding the First Building Site in lieu of a finalised post-development DTM for the entire Bradfield site. It is recommended that the flood model be updated once the site grading is confirmed and for the modified model be used to re-simulate the 1% AEP event or any other storm events of interest.

3. Overland Flows Assessment

The post-development landform was simulated for the 1% AEP design storm. The flood results are shown in the following figures:

- Figure 2: Peak flood depths during the 1% AEP design flood for existing conditions
- Figure 3: Peak flood levels during the 1% AEP design flood for existing conditions
- Figure 4: Peak flood depths during the 1% AEP design flood for post-development conditions
- Figure 5: Peak flood levels during the 1% AEP design flood for post-development conditions

Figure 4 and Figure 5 show the First Building development is likely to impact local overland flow during the 1% AEP design event. Some local overland flows are predicted to pond in the road adjacent to and west of the First Building. Some minor flows are then expected to “spill” into the First Building site as local runoff flows into the low-point along that road. Ponding in the road is expected to reach a maximum of 0.30 metres during the 1% AEP flood. Flood depths at the First Building site are not predicted to exceed 0.05 metres during the same design event.

However, Advisian has been advised by AECOM that permanent stormwater structures will be designed to accommodate any runoff that arrives at this location. The stormwater drainage system has not been included in Advisian’s TUFLOW model as these structures are still to be finalised.

The local ponding in the road adjacent to the First Building is expected to be alleviated by a number of stormwater pits and pipes that will be sited at this location. Accordingly, the overland flows in the vicinity of the First Building shown in Figure 4 and Figure 5, are not expected to manifest as they will be mitigated as part of the final road and lot layout design.

I trust that this letter report provides a suitable description of the predicted overland flow behaviours in the vicinity of the First Building during the design 1% AEP storm event. Please do not hesitate to contact me on 0407063711 should you require further information.

Yours sincerely,

ADVISIAN



Chris Thomas

Principal Consultant

NSW Practice Lead – Water Resources

FIGURE 1

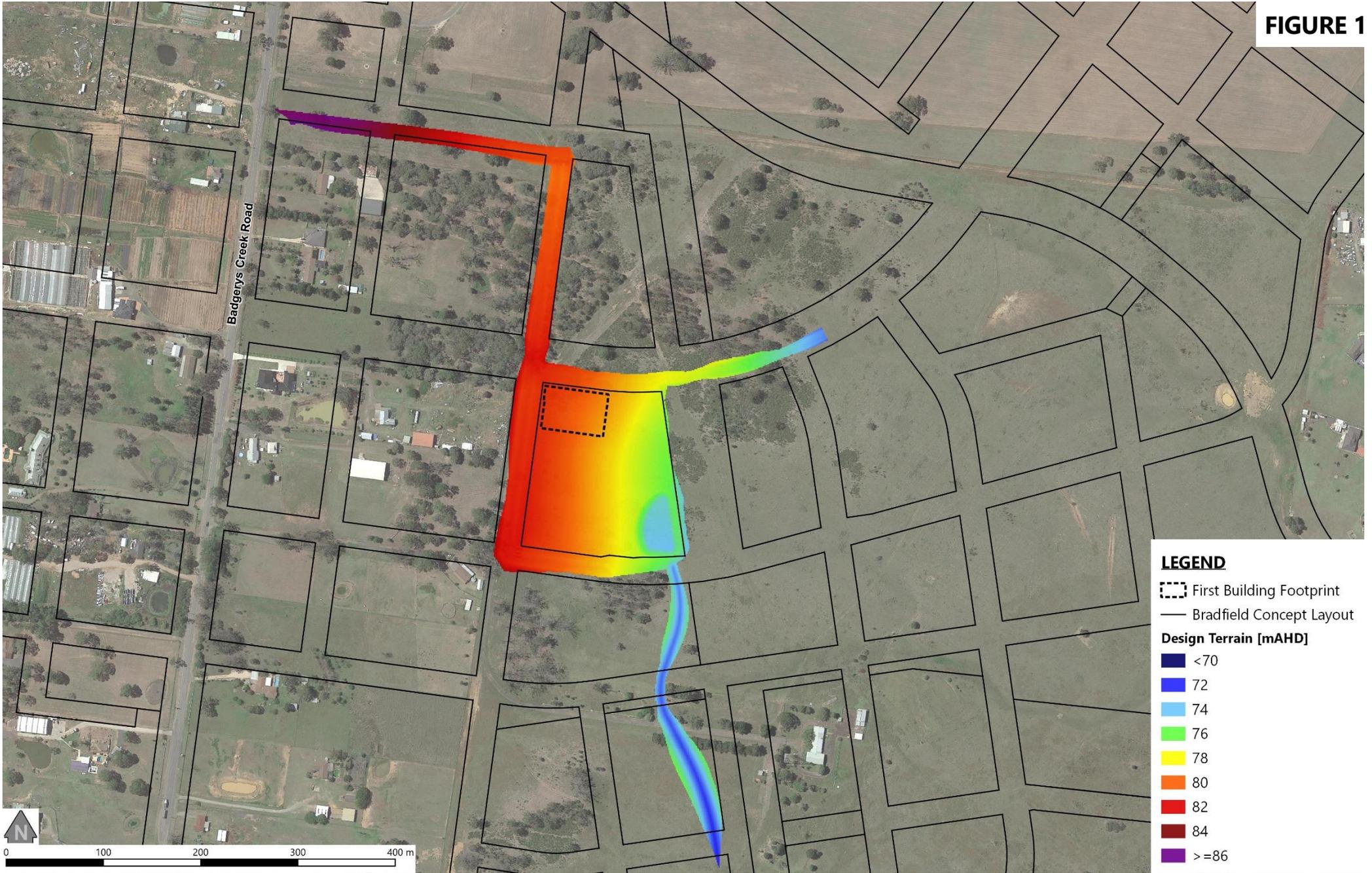


FIGURE 2

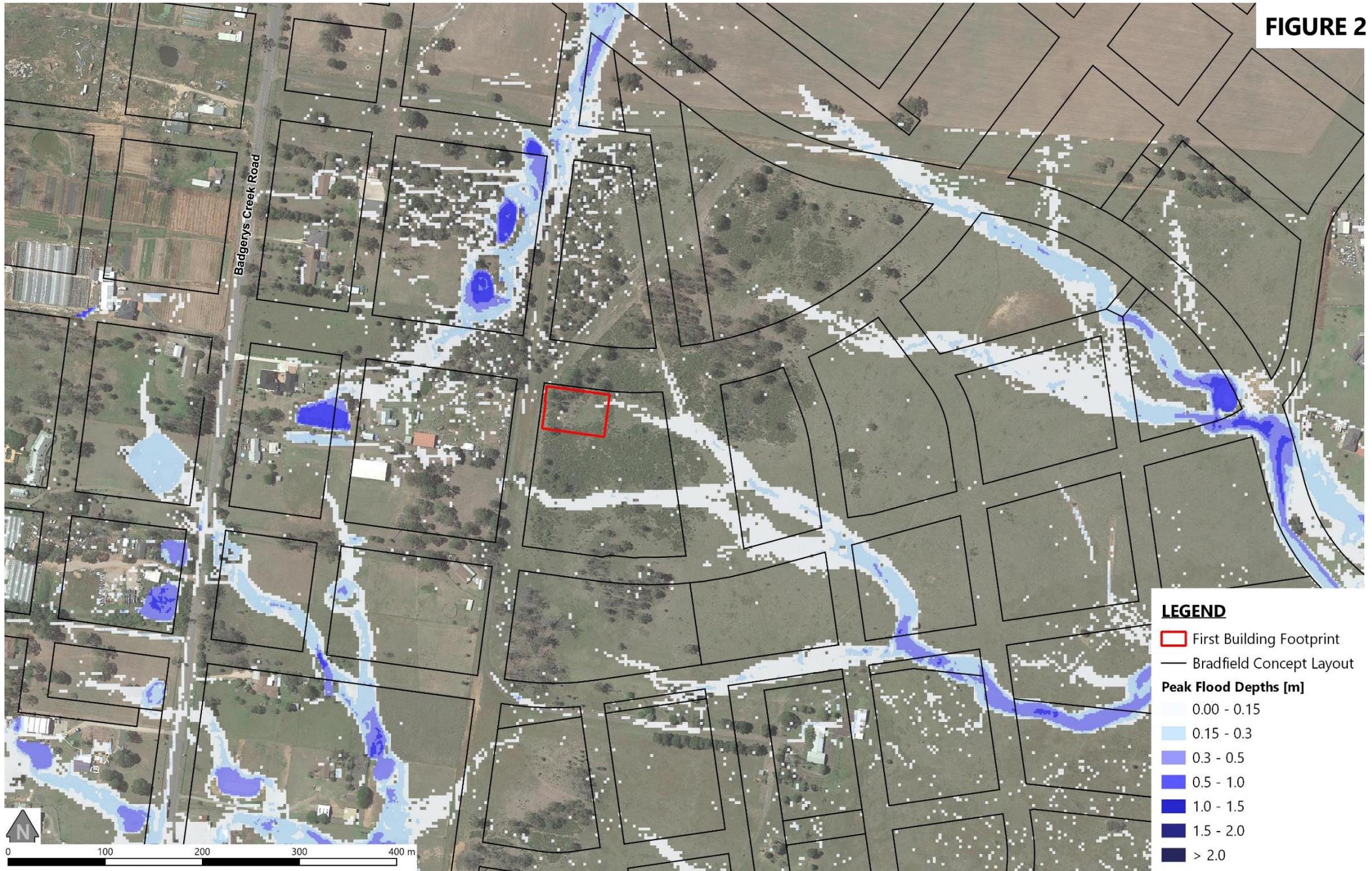


FIGURE 3

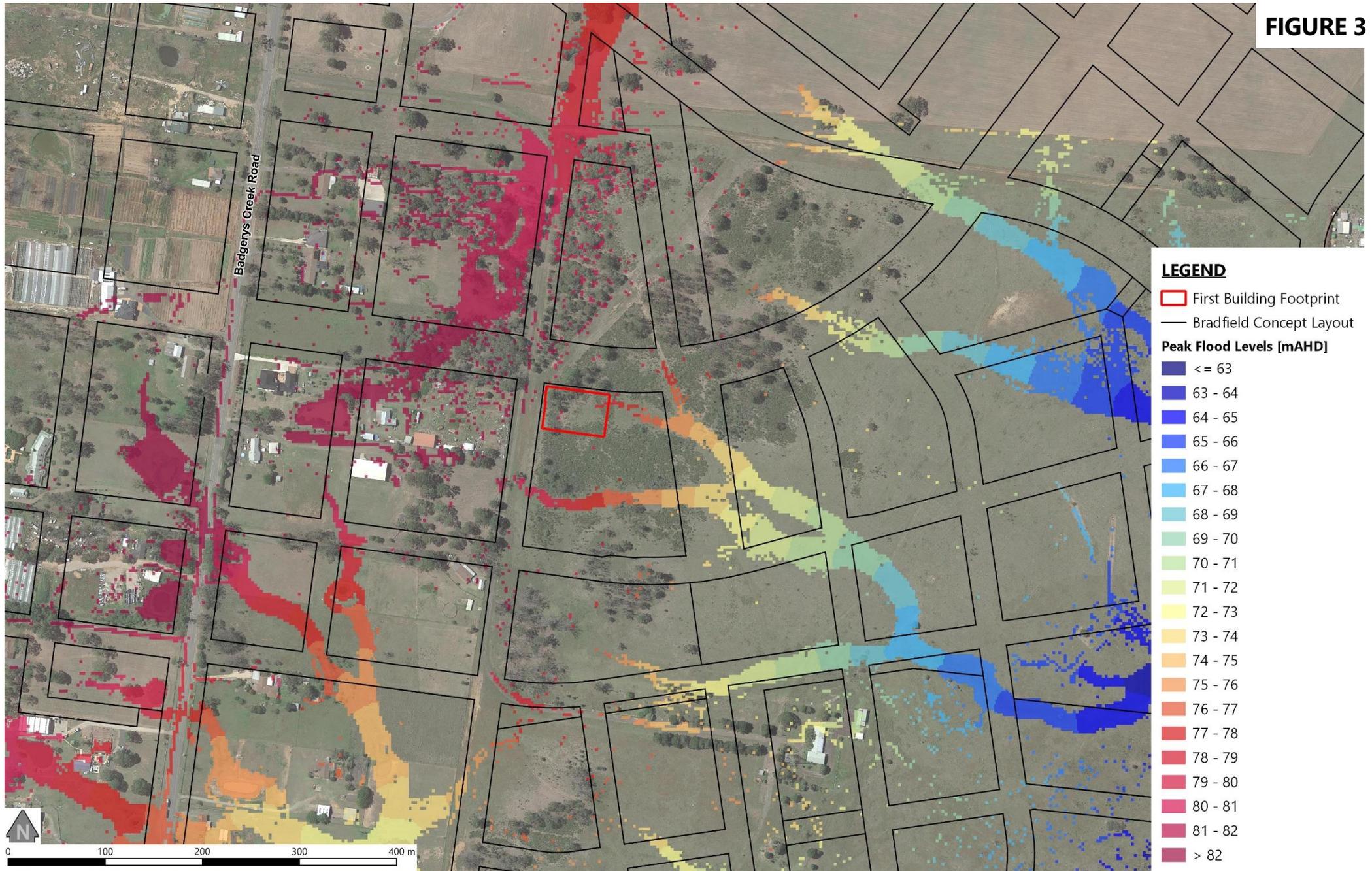


FIGURE 4

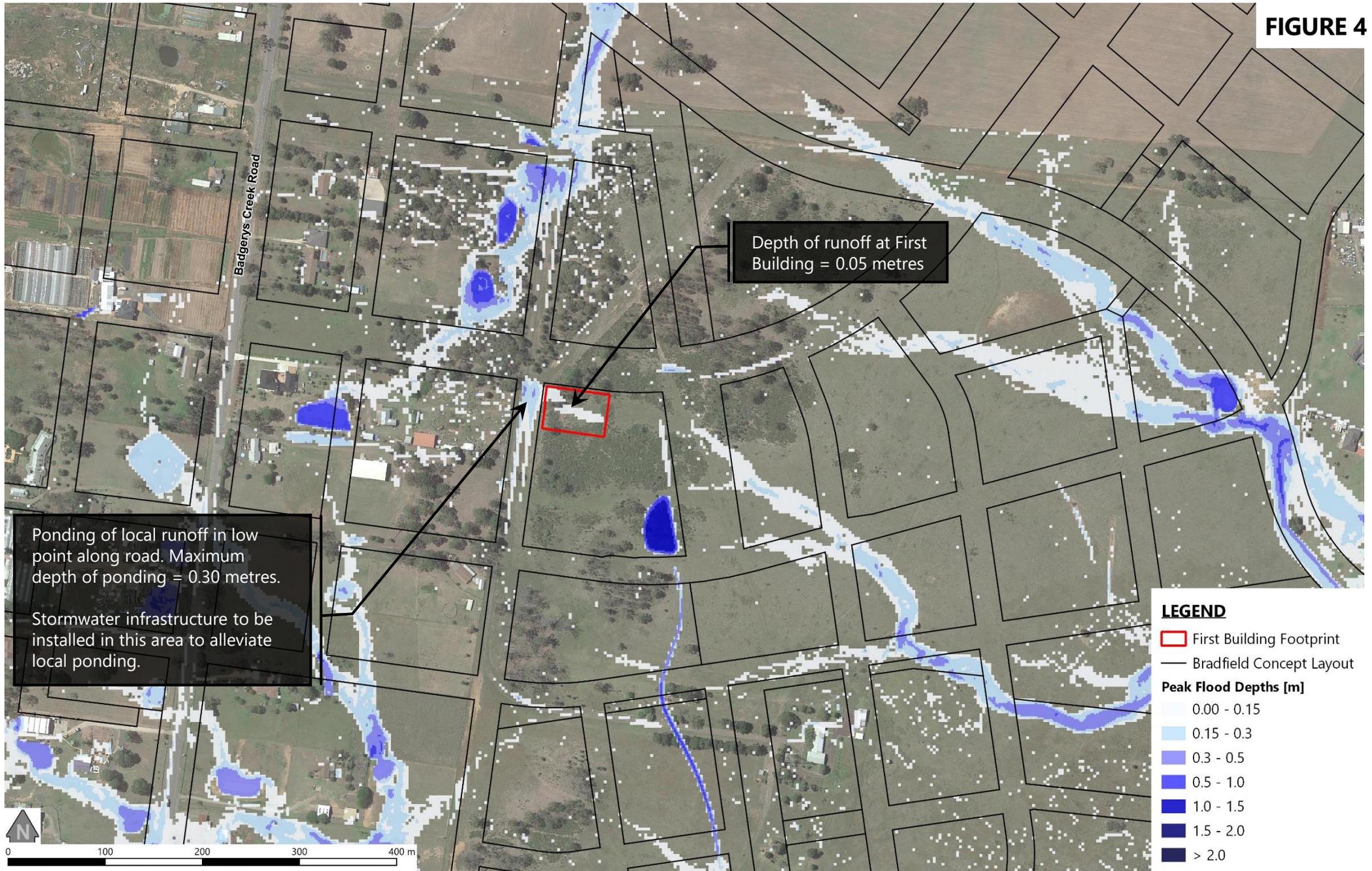
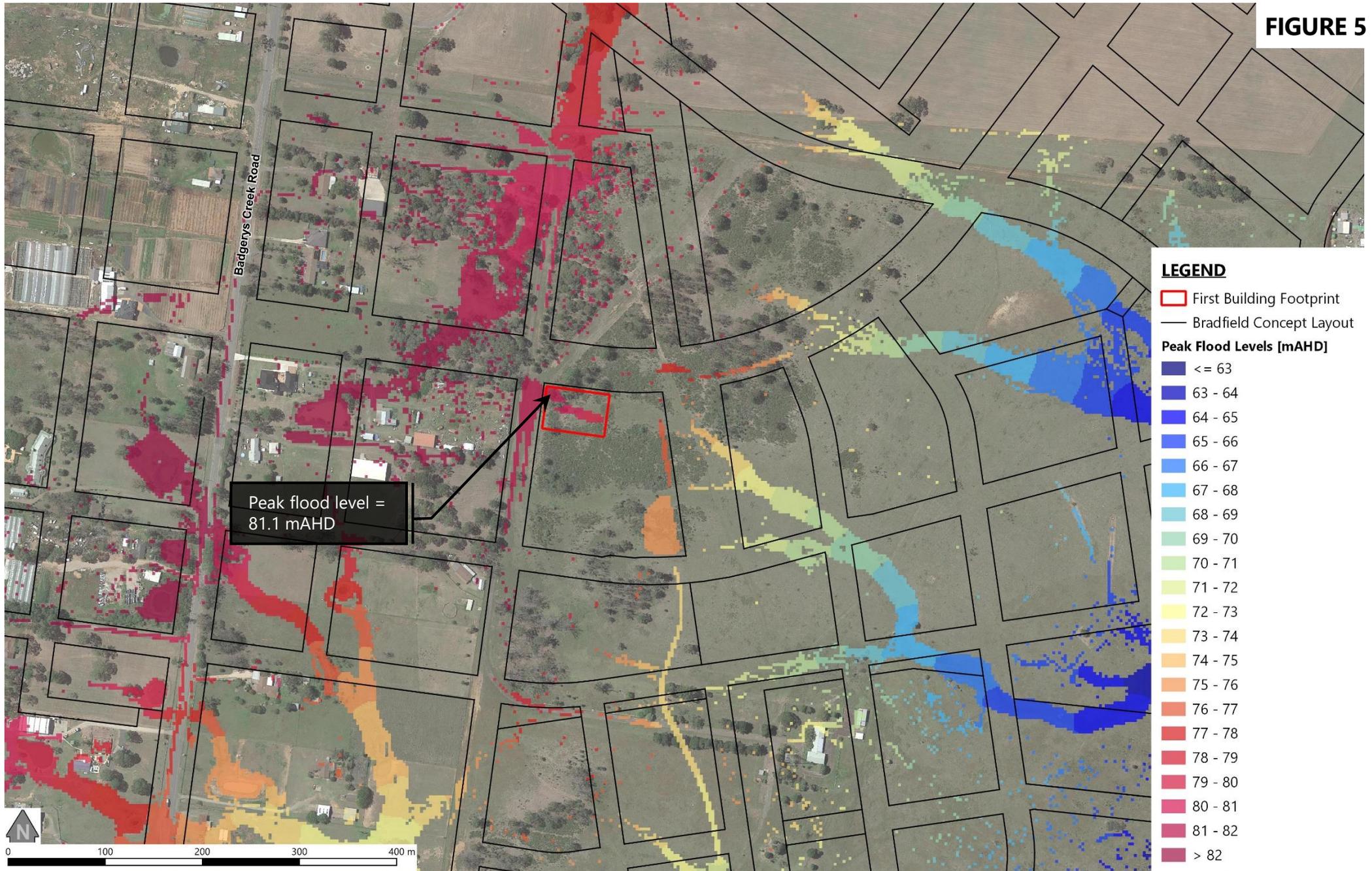


FIGURE 5

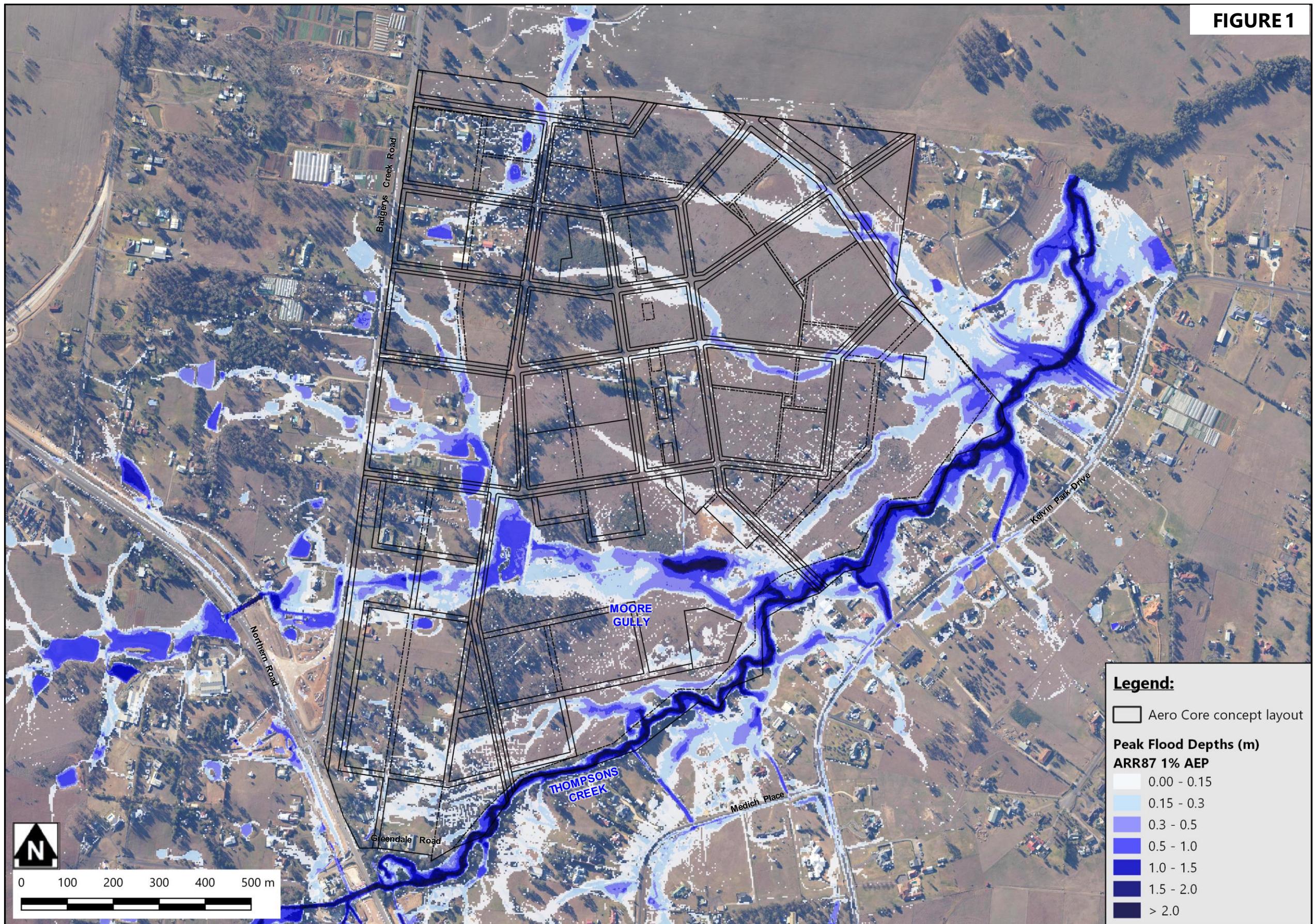


APPENDIX A

PREVIOUS TUFLOW MODELLING RESULTS

Source: Advisian, March 2021

FIGURE 1



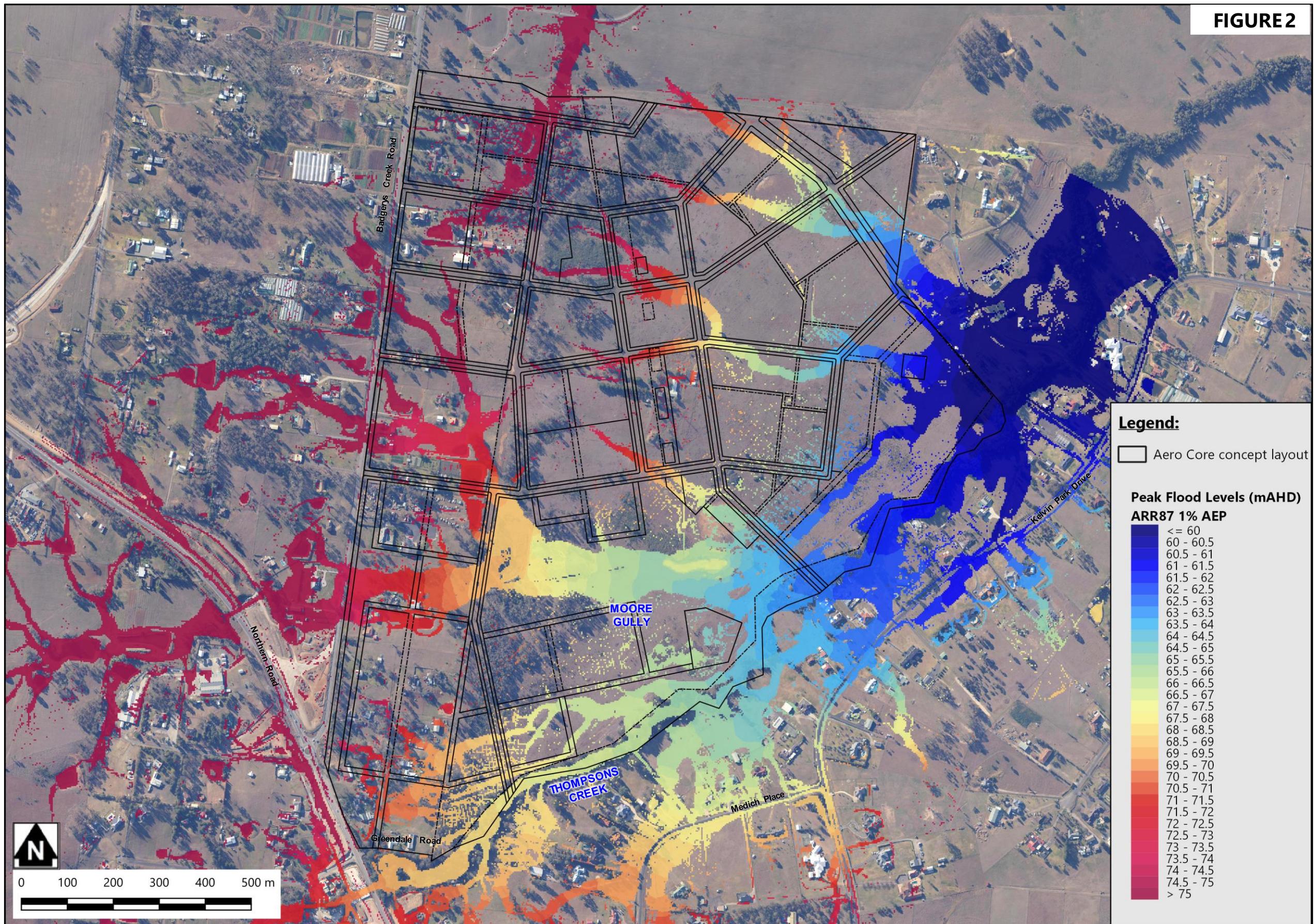
Legend:

- Aero Core concept layout

Peak Flood Depths (m)
ARR87 1% AEP

- 0.00 - 0.15
- 0.15 - 0.3
- 0.3 - 0.5
- 0.5 - 1.0
- 1.0 - 1.5
- 1.5 - 2.0
- > 2.0

FIGURE 2



Legend:
□ Aero Core concept layout

Peak Flood Levels (mAHD)
ARR87 1% AEP

<= 60
60.5 - 60.5
60.5 - 61
61 - 61.5
61.5 - 62
62 - 62.5
62.5 - 63
63 - 63.5
63.5 - 64
64 - 64.5
64.5 - 65
65 - 65.5
65.5 - 66
66 - 66.5
66.5 - 67
67 - 67.5
67.5 - 68
68 - 68.5
68.5 - 69
69 - 69.5
69.5 - 70
70 - 70.5
70.5 - 71
71 - 71.5
71.5 - 72
72 - 72.5
72.5 - 73
73 - 73.5
73.5 - 74
74 - 74.5
74.5 - 75
> 75

