



Future case scenario

Future case hydrology was required for a sensitivity analysis of potential changes in flooding as the result of future development in the Pinehaven catchment.

Historical development records and the UHCC urban growth strategy 2007 were used to forecast an additional 155 dwellings in Pinehaven in 20 years time from infill development. However the majority of development in the catchment is forecast to come from the green field development of the Guilford lot on the eastern and southern boundaries of the catchment. Initial estimates forecast that this could add an additional 1500 dwellings to the catchment. The location of the Guilford lot in relation to the catchment is shown in Figure 8.

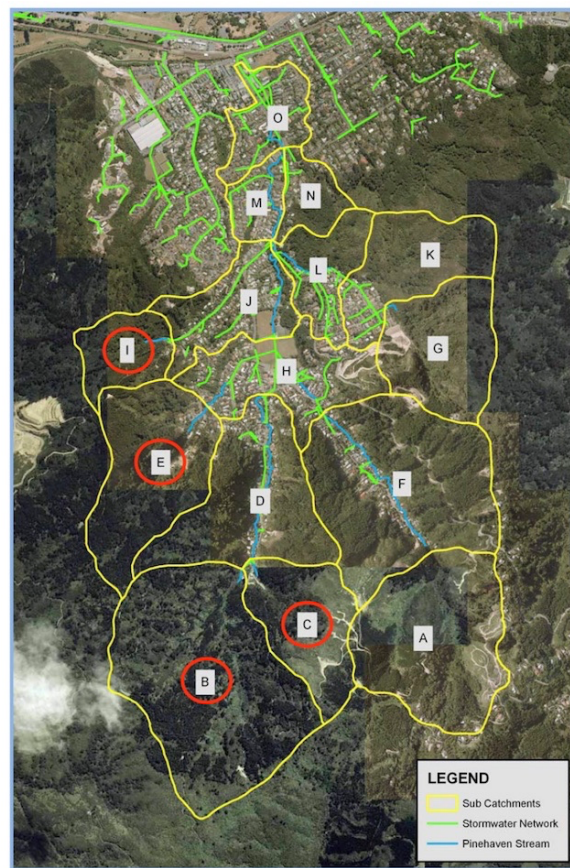


Figure 7 Pinehaven Sub catchments used for Hydraulic Modelling

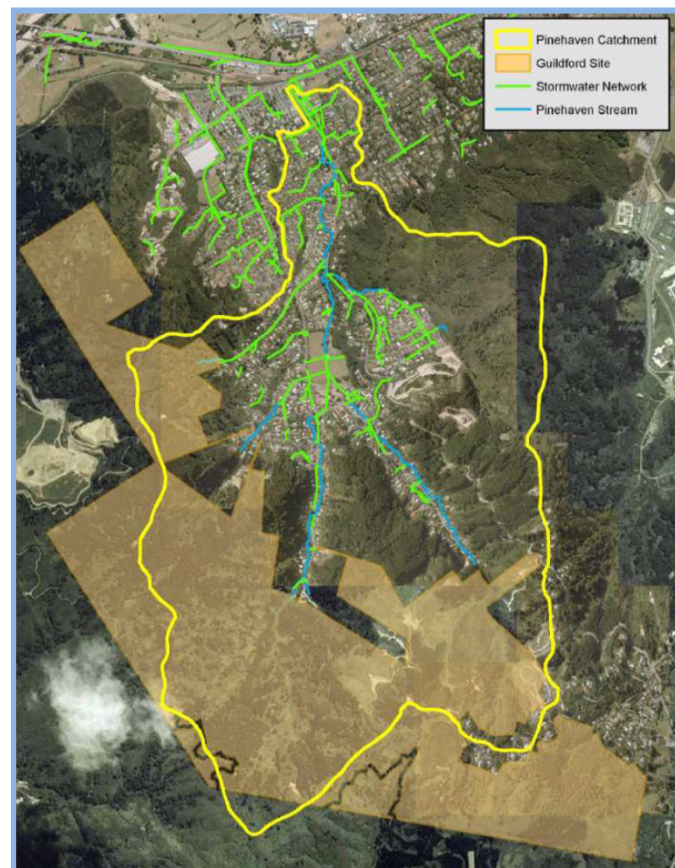


Figure 8 Guilford Land

To provide the required level of detail for the future case hydraulic modelling the following methodology was used:

- As the Guilford development makes up the majority of the new dwellings the predicted 1665 new dwellings for Pinehaven were distributed over this area (sub-catchments I, E, B & C); and
- Distribution of the dwellings was undertaken assuming any undeveloped land (in sub catchments I, E, B & C) would be divided into lot sizes of 750m² (minimum size for a residential conservation lot in the Upper Hutt District Plan) and each with a connected impervious area of 40%.



6.3. Future Development in the Catchment

In this investigation the future development in the catchment was also analysed in the 100 year storm with the predicted impacts of climate change and the 10 year storm without climate change. For details on how the future case hydrology was developed refer to section 3.2.

The modelled flood extents associated with the 100 year storm including climate change for the current existing hydrology are compared with the flooding extents from the future case hydrology in Figure 19.



Figure 19 Current Existing vs. Future Case Comparison of Predicted Flooding Extents in the Q₁₀₀ with Climate Change.

The model results show that there is the potential for future development to increase flooding in the catchment as connected impervious areas can have a much faster runoff response, with less catchment losses than vegetated catchments. However this comparison of the 100 year rainfall event also shows that the change in extents are minor and may be possible to be mitigated. The steep topography of the catchment appears to constrain the overflows in the upper catchment and thus the minor differences observed are in the lower catchment in the vicinity of Whiteman’s Road. The comparison of the modelled inundation depths between current existing and future case hydrology for the 100 year storm results in less than 100mm increase in inundation depths across the catchment.

This analysis was undertaken using the 100 year rainfall event, where much of the floodplain is already inundated. This may have resulted in the impacts of changes in the catchment being drowned out. In lower order flood events the impacts of development are likely to be more readily observed and therefore the assessment of effects for future developments in the catchment should be undertaken in more detail on a case by case bases.