



## **Carisbrook Levee Overland Flow Questions May, 2021**

1. How many megalitres of water can be held south of the highway and west of the proposed levee with 300 mm freeboard and how many megalitres of water can be held before the levee or highway is breached?

- a) Approximately 99ML stored at the design flood level
- b) Approximately 152ML stored before the levee would start to overtop

2. How many megalitres of water can pass through one 1.2 x 1.2 metre culvert in one hour at full capacity?

Approximately 11.7 ML/hr will pass through one 1200x1200 culvert at the Pyrenees Highway at the design flood level. Total discharge for the 2 culverts will be double this. Discharge will be less at lower levels.

3. How long will it take for the water to drain under the highway if the area south of the highway and west of the proposed levee is at full capacity?

The area will take approximately 4 to 6 hours for most of the flood water to recede, depending on the location.

*(Please refer to the Carisbrook: 1% AEP flood depth (m) – 6 hour rainfall event – Ultimate Mitigation Scenario – animation)*

4. Why is the railway line not been opened up so water flows freely from the south and west of the line going north?

The construction approvals are being obtained for the continuation of the drain through the rail reserve. Given the current status of the railway line, consideration is being made by the rail authorities for an open drain to be constructed instead of box culverts.

5. How many megalitres of water can pass through the 4 culverts under the rail line as per the plans in 1 day?

Approximately 535 ML/day

6. Where will 3000 to 4000 megalitres of water go in a 1 in 100 year flood as this happens in a very short time and by Water Technology figures only 535 ML/day can pass through the 2 culverts and by CMA figures based on the Lidar information only 94 ML can be held upstream of Pyrenees Highway.

It must be understood that the quoted figure of 4,000 ML/day is a peak flow rate that occurs at a particular point in time – it is not a flow rate that is continuous over a 24-hour period.

A simple analogy would be a car in the Bathurst 1000 that hits a top speed of say 300km/h. This does not mean that over the 8 hours of the event the car will have travelled 2,400km, because the peak speed of 300km/h is over a short duration within the overall event duration.

Table 4.23 in the Carisbrook Flood and Drainage Management Plan (see below) illustrates how the peak flows for the various flood components are of short duration.

The design of the levee (and the culverts under the Pyrenees Highway and the railway line) is based on flood modelling undertaken by acknowledged experts in hydrology (and then peer-reviewed). The flood modelling clearly demonstrates that the peak flow (for a 6-hour duration 1% AEP event) can be adequately catered for by the combination of above-ground storage and the above-mentioned culverts.

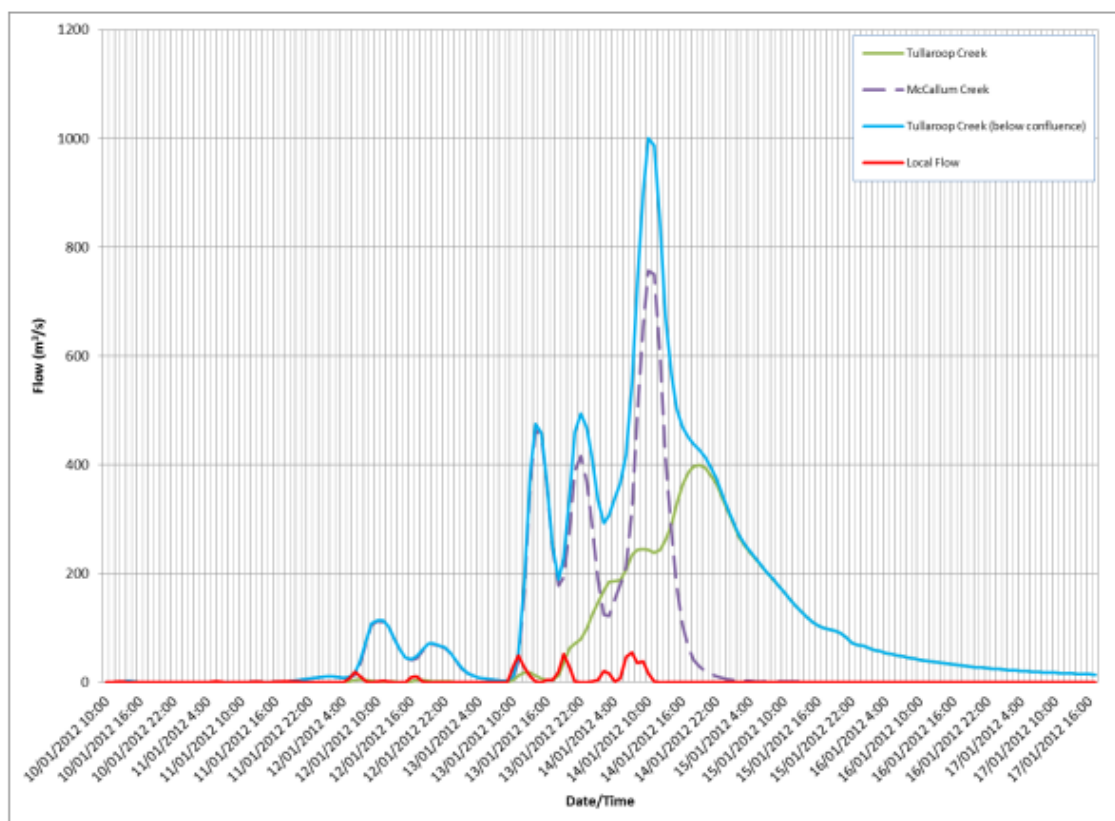


Figure 4-23 Flood hydrographs in Carisbrook – January 2011

Carisbrook Flood and Drainage Management Plan 2013 report, Figure 4-3:

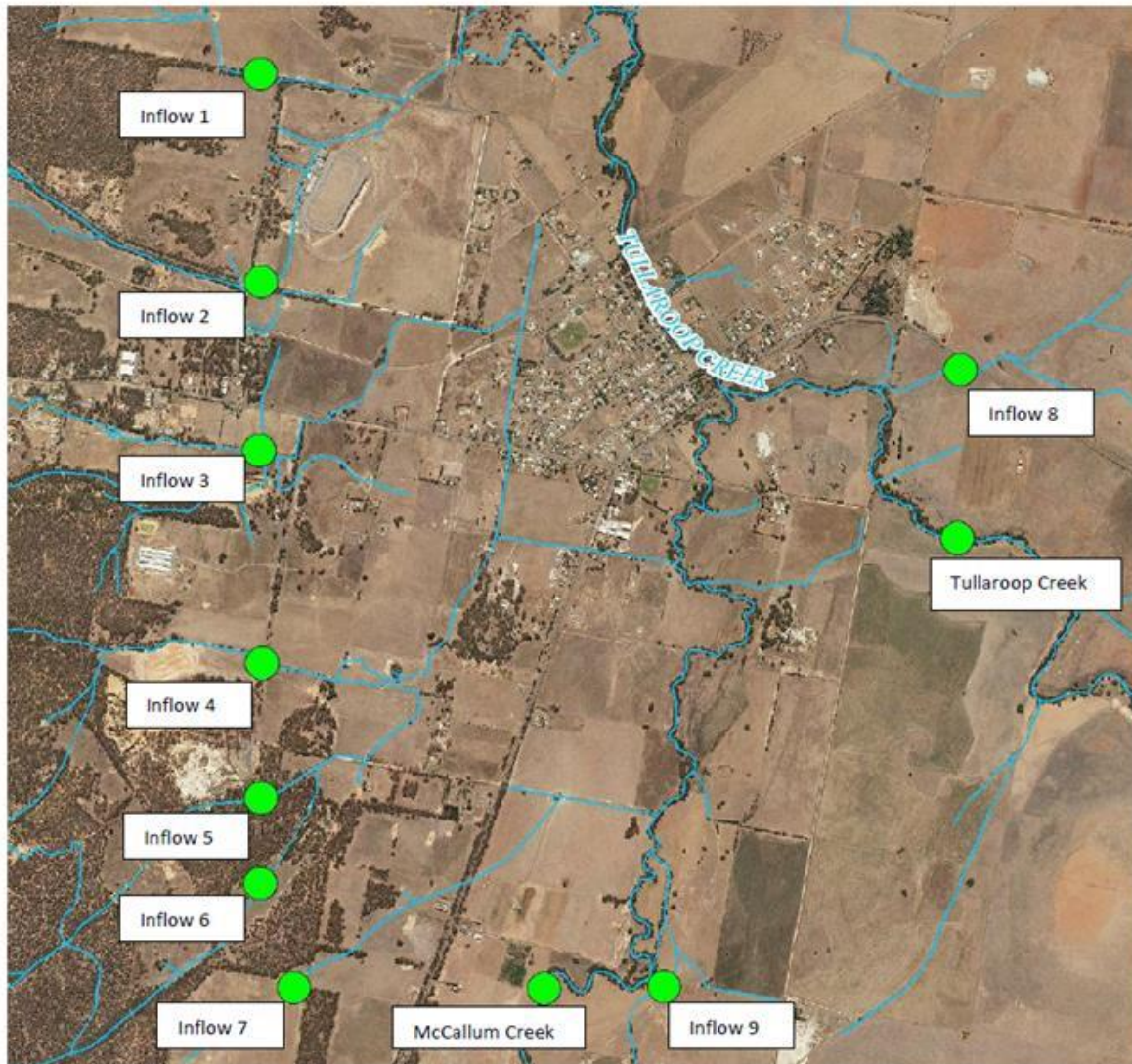


Figure 4-3 Location of RORB extracted hydrographs around Carisbrook

7. When was it decided and by whom to use Pleasant Street between Pyrenees Highway and the rail line as part of the levy? The original plan was for the levy bank to be west of the road with a strip of land to be bought for a drain (channel).

The road reserves are public land which are available for the levee footprint, which was considered a favourable option through the consultation with the directly affected property owners.

8. Who in the shire is responsible for the final plans?

Design has been undertaken by consultants Entura