

26 February 2021

Water Resource Management Ltd  
5 Teignmouth Street  
Abbotsford  
Dunedin 9018

Attn: Matt Hickey

**Re: Royal Burn – Gauging results for work completed 22 February 2021**

NIWA Alexandra were engaged to complete flow gauging measurements within the Royal Burn catchment to enable determination of flow losses or gains in this reach, as requested by the client.

This measurement work was completed on 22 February 2021.

A total of 9 locations chosen by the client, were visited by the NIWA Alexandra Field Team. Discharge measurements using a Sontek 'FlowTracker' ADV instrument were completed at each location. The small flow volume in hydraulically difficult, weedy channel locations were raked and modified to obtain the best flow condition possible, prior to each measurement.

The results and photographs are in a table attached to this letter.

Should you have any question relating to this work, please contact me.

Yours faithfully  
Neil Blair

Approved for release  
Marty Flanagan



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NIWA Project:                      WRM21901

Results table:

Gauged flow results are summarised in the following table (in order of time sampled).

| Date       | Time (NZST) | Site Number | Site Name   | Waypoint | Location NZTM        | Stage (mm) | Flow (L/s) |
|------------|-------------|-------------|---|----------|----------------------|------------|------------|
| 22/02/2021 | 7:53        | 100         | Royal Burn at SH 6                                  | 504      | E1295458<br>N5007801 | N/A        | 25.5       |
| 22/02/2021 | 8:37        | 200         | Royal Burn at Crown Rd Bridge                       | 505      | E1274718<br>N5011356 | 200        | 44.3       |
| 22/02/2021 | 9:20        | 300         | Royal Burn at Swamp                                 | 506      | E1275292<br>N5011779 | N/A        | 12.4       |
| 22/02/2021 | 9:54        | 400         | Royal Burn North Branch at below Glencoe Rd culvert | 507      | E1275363<br>N5011898 | N/A        | 9.0        |
| 22/02/2021 | 10:26       | 500         | Royal Burn South Branch at above Glencoe Rd culvert | 508      | E1275433<br>N5011882 | N/A        | 8.8        |
| 22/02/2021 | 11:17       | 600         | Royal Burn at Below Brodie Race                     | 509      | E1275636<br>N5012388 | N/A        | 16.8       |
| 22/02/2021 | 12:20       | 700         | Royal Burn at above Brodie Race                     | 510      | E1275639<br>N5012403 | N/A        | 25.4       |
| 22/02/2021 | 12:16       | 800         | Royal Burn at below top intake                      | 512      | E1275632<br>N5012970 | N/A        | 20.0       |
| 22/02/2021 | 13:13       | 900         | Royal Burn at above top take                        | 511      | E1275710<br>N5013048 | N/A        | 19.2       |

1. Site Photos:



Figure 1: Site 100 view upstream



Figure 2: Site 100 view downstream



Figure 3: Site 200 view upstream



Figure 4: View downstream



Figure 4: Site 200 External Staff Gauge



Figure 5: Site 300 view from true right bank



Figure 6: Site 300 view upstream



Figure 7: Site 300 view downstream



Figure 8: Site 400 view downstream



Figure 9: Site 400 view upstream



Figure 10: Site 500 view upstream



Figure 11: Site 500 view downstream



Figure 12: Site 600 view upstream





Figure 13: Site 600 view downstream



Figure 14: Site 700 view downstream



Figure 15: Site 700 view upstream



Figure 16: Site 800 view upstream



Figure 17: Site 800 view downstream



Figure 18: Dam intake



Figure 19: Dam intake from bank



Figure 20: Site 900 view downstream



Figure 21: Site 900 view upstream

2. Site Map:



