

Appendix B

Locations and Maps

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B1.1 Schedules of Locations

The following Schedules are copied from the Resource Consents Application Document that accompanies this report. They list the locations of the following:

- *Schedule A.1:* Waianiwaniwa Dam and storage reservoir
- *Schedule A.2:* Inlet canal and tunnel from the Waimakariri River to the Waianiwaniwa Reservoir
- *Schedule A.3:* Headrace canal
- *Schedule A.4:* Water distribution race network
- *Schedule A.5:* Rakaia River intake and headworks
- *Schedule A.6:* Upper Waimakariri River intake and headworks
- *Schedule A.7:* Lower Waimakariri River (Gorge Bridge) intake and headworks
- *Schedule A.8:* Pump stations
- *Schedules B.1 – B.4:* Locations of the dam and divert, river and stream crossings
- *Schedules C.1 – C.4:* Locations of discharges

SCHEDULE A: Locations of the Proposed Major Facilities for the Central Plains Water Enhancement Scheme

Schedule A.1: Waianiwaniwa Dam and storage reservoir

The proposed Waianiwaniwa Dam will be constructed at the mouth of the Waianiwaniwa valley where it leaves the Malvern Hills between approximate map references NZMS 260 L35: 276-478 and L35: 260-478.

The proposed Waianiwaniwa Reservoir water storage lake will extend about 8.5 kilometres upvalley from the dam, and into the tributary valleys that join the main Waianiwaniwa Valley, at about the 280 m elevation above sea level, and will occupy approximately 12 square kilometres of the valley floor and adjacent hillside slopes.

The location of the Waianiwaniwa Dam and Reservoir are shown on Map 1 below.

Schedule A.2: Inlet canal and tunnel from the Waimakariri River to the Waianiwaniwa Reservoir

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The proposed inlet canal from the Waimakariri Valley to the Waianiwaniwa Reservoir will follow an approximately 15.5 kilometre route from the Upper Waimakariri River intake to be located in the bed of the Waimakariri River at approximate map references NZMS 260 L35: 254-675, to the eastern edge of the Malvern Hills where it will enter a tunnel at about map reference NZMS L35: 301-562. The final location of the inlet canal will be within the designation zone as shown on Map 2 attached to this application.

The inlet canal will follow a course generally southeast along the true right bank of the Waimakariri River, crossing the Kowai River at about map reference NZMS 260 L35: 267-649, and then climbing the true right bank terrace of the Waimakariri River to reach the main plains surface near Gorge Hill at about map reference NZMS 260 L35: 316-602. It then runs generally south to about map reference NZMS 260 L35: 322-584, and then southwest, passing adjacent to Sheffield School, crossing the Hawkins River, and ending at the tunnel portal.

The tunnel taking water from the inlet canal to the Waianiwaniwa Reservoir will extend for approximately 3 kilometres southwest between approximate map references NZMS L35: 301-562 and L35: 280-539.

The route of the inlet canal and tunnel are shown on Map 2 below.

Schedule A.3: Headrace

The proposed headrace will extend from the Rakaia River intake for approximately 61.4 kilometres across the upper Central Plains following approximately the 235 metre elevation contour line, to the Waimakariri River at the lower Gorge Bridge intake structure. The final location of the headrace will be within the designation zone, as shown on Maps 3 to 6 attached to this application.

The western end of the headrace will start in the bed of the Rakaia River at or about map reference NZMS K36: 071-392, and runs generally southeast for approximately 9 kilometres along the true left side of the Rakaia River, and traverses the terrace faces here to reach the main plains surface at about map reference NZMS L36: 141-328. The route then runs generally east for approximately 4.5 kilometres to cross Rakaia Terrace Road at about map reference NZMS L36: 176-328, and then turns to run generally north for approximately 6 km to cross Leaches Road at about map reference NZMS L36: 188-379, and the Hororata River at about map reference NZMS L36: 196-398. The route then turns to the northeast and follows the 235 m elevation contour along the lower slopes of the Harper Hills for approximately 10 kilometres to cross the Coalgate- Hororata Road at about map reference NZMS 260 L35: 257-457, the Selwyn River at about map reference NZMS 260 L35: 259-461, and State Highway 77 at about map reference NZMS L35: 270-474. The route then runs east-northeast along the lower slopes of the Homebush Ridge for approximately 3.5 kilometres to about map reference NZMS 260 L35: 311-494, where it crosses Deans Road. The route then runs east for approximately 4 kilometres across the plains crossing the Hawkins River at about map reference NZMS 260 L35: 328-493, and State Highway 73 and the Midland Railway line at about map reference NZMS 260 L35: 350-502. It then runs northeast for approximately 5 kilometres to near Bleak House Corner where it crosses the Old West Coast Road at about map reference NZNS 260 L35: 385-535. It then turns to run generally northwest for approximately

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8.5 kilometres, traversing the terrace on the true right bank of the Waimakariri River and finishing at the Waimakariri Gorge Bridge intake at about map reference NZMS 260 L35: 328-603.

The route of the headrace canal is shown on Maps 3 to 5 below.

Schedule A.4: Water distribution race network

The proposed water distribution race network will follow roads or run through private property in the rural areas of the inner Central Plains. The northern boundary runs along the Waimakariri River from about the Kowai River confluence downstream for approximately 35 kilometres, and the southwestern boundary runs along the Rakaia River from near the Gorge Bridge southeast to the Satate Highway 1 Bridge. The northwestern boundary follows the inner plains margin. The southeastern margin follows State Highway 1 generally northeast from Rakaia to the Selwyn River, and then trends more generally north and north-northeast to the Waimakariri River. Parts of the race network will pass near the settlements of Springfield, Sheffield, Darfield, Kirwee, Coalgate, Hororata, Windwhistle, Te Pirita, and Dunsandel.

The routes of the water distribution race network are shown on Maps 6 to 9 below.

Schedule A.5: Rakaia River intake and headworks

The proposed Rakaia River intake and headworks structures will form part of the headrace canal in and adjacent to the bed of the Rakaia River at the following locations.

1. Intake structure in the bed of the Rakaia River at about map reference NZMS 260 K36: 078-387
2. Sediment trap at about map reference NZMS 260 K36:081-384
3. Flow control gate at about map reference NZMS 260 K36:082-381
4. Fish screen and bypass channel at about map reference NZMS 260 K36: 083-379

Schedule A.6: Upper Waimakariri River intake and headworks

The proposed Upper Waimakariri River intake and headworks structures will form part of the inlet canal in and adjacent to the bed of the Waimakariri River at the following locations.

1. Intake structure in the bed of the Waimakariri River at about map reference NZMS 260 L35: 255-667
2. Sediment trap at about map reference NZMS 260 L35: 259-662
3. Flow control gate at about map reference NZMS 260 L35: 082-381
4. Fish screen and bypass channel at about map reference NZMS 260 L35: 261-658

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Schedule A.7: Lower Waimakariri River (Gorge Bridge) intake and headworks

The proposed lower Waimakariri River intake and headworks structures will form part of the headrace canal in and adjacent to the bed of the Waimakariri River at the following locations.

1. Intake structures in the bed of the Waimakariri River at about map reference NZMS 260 L35: 328-603
2. Sediment trap at about map reference NZMS 260 L35: 334-592
3. Flow control gate at about map reference NZMS 260 L35: 334-588
4. Fish screen and bypass channel at about map reference NZMS 260 L35:336-583

Schedule A.8: Pump stations

Pump stations are proposed at the following locations.

1. On the inlet canal at about map reference NZMS 260 L35: 269-637
2. On the headrace in the Waimakariri Valley at about map reference NZMS 260 L35: 352-569
3. On the headrace near the Waianiwaniwa Dam at about map reference NZMS 260 L35: 277-477
4. On the headrace in the Rakaia Valley at about map reference NZMS 260 L36: 120-348
5. On the Windwhistle race network at about map reference NZMS 260 L36: 141-385

SCHEDULE B: Locations of proposed Dam and Divert, River and Stream Crossings

Schedule B.1: Waianiwaniwa dam site

It is proposed to dam and divert the Waianiwaniwa River at about map reference NZMS 260 L35: 275-477

Schedule B.2: Inlet Canal to the Waianiwaniwa Reservoir

The proposed route of the inlet canal will cross rivers and streams at the following locations.

1. Kowai River at about map reference NZMS 260 L35: 267-649
2. Kowai River at about map reference NZMS 260 L35: 265-651
3. Hawkins River at about map reference NZMS 260 L35: 302-563
4. Unnamed tributary of Waimakariri River at about map reference NZMS 260 L35: 261-656

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5. Unnamed tributary of Waimakariri River at about map reference NZMS 260 L35: 257-662
6. Unnamed tributary of Waimakariri River at about map reference NZMS 260 L35: 256-663

Schedule B.3: Headrace canal

The proposed route of the headrace canal will cross rivers and streams at the following locations.

1. Hororata River at about map reference NZMS 260 L36: 196-398
2. Selwyn River at about map reference NZMS 260 L35: 259-461
3. Hawkins River at about map reference NZMS 260 L35: 328-493
4. Cordys Stream at about map reference NZMS 260 L35: 215-421
5. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 198-408
6. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 204-409
7. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 205-409
8. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 209-414
9. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 211-417
10. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 220-422
11. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 223-428
12. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 226-428
13. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 227-428
14. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 233-433
15. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 237-434
16. Unnamed tributary of Selwyn River at about map reference NZMS 260 L35: 247-448
17. Unnamed tributary of Selwyn River at about map reference NZMS 260 L35: 247-250
18. Unnamed tributary of Selwyn River at about map reference NZMS 260 L35: 252-451
19. Unnamed tributary of Waianiwaniwa River at about map reference NZMS 260 L35: 283-480
20. Unnamed tributary of Waianiwaniwa River at about map reference NZMS 260 L35: 276-476
21. Unnamed tributary of Waianiwaniwa River at about map reference NZMS 260 L35: 294-486
22. Unnamed tributary of Waianiwaniwa River at about map reference NZMS 260 L35: 297-481
23. Unnamed tributary of Waianiwaniwa River at about map reference NZMS 260 L35: 306-488
24. Unnamed tributary of Waianiwaniwa River at about map reference NZMS 260 L35: 287-482
25. Blacks Stream at about map reference NZMS 260 L35: 309-494

Schedule B.4: Water distribution race network

The proposed routes of the water distribution race network will cross rivers and streams at the following locations.

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1. Unnamed Tributary of the Hororata River at about map reference NZMS L35: 058-425
2. Unnamed Tributary of the Hororata River at about map reference NZMS L35: 074-429
3. Unnamed tributary of Hororata River at about map reference NZMS 260 L36: 141-378
4. Unnamed tributary of Hororata River at about map reference NZMS 260 L36: 154-383
5. Unnamed tributary of Hororata River at about map reference NZMS 260 K35: 096-399
6. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 105-401
7. Unnamed tributary of Hororata River at about map reference NZMS 260 L35: 122-409
8. Unnamed tributary of Selwyn River at about map reference NZMS 260 L35: 263-443
9. Unnamed tributary of Selwyn River at about map reference NZMS 260 L35: 260-456
10. Unnamed tributary of Rakaia River at about map reference NZMS 260 L36: 266-224
11. Unnamed tributary of Rakaia River at about map reference NZMS 260 L36: 271-236
12. Irwell River at about map reference NZMS 260 L36: 420-296
13. Irwell River at about map reference NZMS 260 L36: 423-296
14. Irwell River at about map reference NZMS 260 L36: 425-296
15. Irwell River at about map reference NZMS 260 L36: 426-296
16. Irwell River at about map reference NZMS 260 L36: 432-295
17. Hawkins River at about map reference NZMS 260 L35: 360-414
18. Unnamed Tributary of the Hawkins River at about map reference NZMS 26 L35: 229-599
19. Unnamed Tributary of the Hawkins River at about map reference NZMS 26 L35: 228-592
20. Unnamed Tributary of the Hawkins River at about map reference NZMS 26 L35: 230-601
21. Unnamed Tributary of the Hawkins River at about map reference NZMS 26 L35: 233-601
22. Unnamed Tributary of the Hawkins River at about map reference NZMS 26 L35: 244-598
23. Unnamed Tributary of the Hawkins River at about map reference NZMS 26 L35: 253-589
24. Unnamed Tributary of the Hawkins River at about map reference NZMS 26 L35: 260-606
25. Unnamed Tributary of the Hawkins River at about map reference NZMS 26 L35: 257-619
26. Unnamed Tributary of the Hawkins River at about map reference NZMS 26 L35: 248-627

SCHEDULE C: Location of Discharges

Schedule C.1: Rakaia River headworks discharges

1. Sediment sluice race discharge at about map reference NZMS 260 K36: 081-381
2. Fish bypass channel at about map reference NZMS 260 K36: 083-378

Schedule C.2: Waimakariri River headworks discharges

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1. Upper Intake sediment sluice race discharge at about map reference NZMS 260 L35: 262-659
2. Upper intake fish bypass channel at about map reference NZMS 260 L35: 263-657
3. Lower (Gorge Bridge) intake sediment sluice race discharge at about map reference NZMS 260 L35: 344-588
4. Lower (Gorge Bridge) intake fish bypass channel at about map reference NZMS 260 L35: 344-588

Schedule C.3: Operational bywash discharges

Operational bywash discharges will occur from water distribution races at the following locations.

1. Race D 2 to a wetland adjacent to the Selwyn River at about map reference NZMS 260 L36: 456-301,
2. Race D 2.1 to a wetland adjacent to the Waimakariri River at about map reference NZMS 260 M35: 523-490
3. Race D 2.2 to a wetland adjacent to the Waimakariri River at about map reference NZMS 260 M35: 539-488
4. Race D 2.3 to a stockwater race at about map reference NZMS 260 M36: 524-371
5. Race D 3 to a wetland adjacent to the Selwyn River at about map reference NZMS 260 L36: 441-305
6. Race C 1 to a wetland adjacent to the Hawkins River at about map reference NZMS 260 L36: 394-330
7. Race C 2 to a wetland adjacent to the Waianiwaniwa River at about map reference NZMS 260 L36: 351-358
8. Race C 3 to a wetland adjacent to the Selwyn River at about map NZMS 260 L36: 350-345
9. Race TP 1 to a wetland adjacent to the Selwyn River at about map NZMS 260 L36: 435-299
10. Race TP 2.6 to a wetland adjacent to the Rakaia River at about map NZMS 260 L36: 329-184

Schedule C.4: Emergency bywash discharges

Emergency bywash discharges will occur from water distribution races at the following locations.

1. Race D 2 to a wetland adjacent to the Selwyn River at about map reference NZMS 260 L36: 456-301,
2. Race D 2.1 to a wetland adjacent to the Waimakariri River at about map reference NZMS 260 M35: 523-490
3. Race D 2.1.1 to the Waimakariri River at about map reference NZMS 260 L35: 477-496
4. Race D 2.2 to a wetland adjacent to the Waimakariri River at about map reference NZMS 260 M35: 539-488
5. Race D 3 to a wetland adjacent to the Selwyn River at about map reference NZMS 260 L36: 441-305

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6. Race C 1 to a wetland adjacent to the Hawkins River at about map reference NZMS 260 L36: 394-330
7. Race C 2 to a wetland adjacent to the Waianiwaniwa River at about map reference NZMS 260 L36: 351-358
8. Race C 3 to a wetland adjacent to the Selwyn River at about map NZMS 260 L36: 350-345
9. Race TP 1 to a wetland adjacent to the Selwyn River at about map NZMS 260 L36: 435-299
10. Race TP 1.1 to the Hororata River at about map NZMS 260 L36: 337-334
11. Race TP 2.6 to a wetland adjacent to the Rakaia River at about map NZMS 260 L36: 329-184
12. Race TP 3.2 to the Rakaia River at about map NZMS 260 L36: 264-219

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B1.2 Maps

Maps 1 – 9 below are copied from the Resource Consents Application Document that accompanies this report. They show the locations of the following.

- *Map 1:* Wainiwaniwa Dam and Reservoir
- *Map 2:* Route of the inlet canal and tunnel from the upper Waimakariri River intake to the Wainiwaniwa Reservoir
- *Map 3:* Route of the northern section of the headrace canal
- *Map 4:* Route of the central part of the headrace canal
- *Map 5:* Route of the southern part of the headrace canal
- *Map 6:* Route of the water distribution race network in the Springfield and Sheffield areas
- *Map 7:* Route of the water distribution race network on the plains between the Waimakariri and Selwyn Rivers
- *Map 8:* Route of the water distribution race network on the plains between the Rakaia and Selwyn Rivers
- *Map 9:* Route of the water distribution race network in the Windwhistle area