

APPENDIX 2

Central Plains Water Enhancement Scheme

Canterbury Regional Council Resource Consent
Conditions

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2000

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Land Use Consents

CRC061814 To excavate and deposit material over an unconfined aquifer

To excavate land to a depth exceeding five metres, or deeper than the highest groundwater level at the site, and to deposit material into excavated land for the purposes of constructing an Inlet Canal, Headrace Canal and Water Distribution Network, along and adjacent to the route identified in Schedules A.1 and A.2. A consent with a duration of 15 years is sought.

Proposed conditions:

1. The works shall be limited to:
 - (a) The excavation of land exceeding five metres deep, and/or deeper than the highest groundwater level at that site; and
 - (b) The deposition of material into excavated landfor the purposes of constructing and Inlet Canal, Headrace Canal and Water Distribution Network
2. The works shall be undertaken in accordance with the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions, attached to this consent.
3. Works shall be confined to the areas shown on the attached plans Central Plains Water Enhancement Scheme – Designation Maps 2 – 10, Distribution Network Maps 2 - 25.
4. The depth of excavation shall not exceed the maximum depth required to construct the Inlet Canal, Headrace Canal and Water Distribution Network. The depth required for the construction of the canals and network shall be specified in the Environmental Construction Management Plan (ECMP) as required in Schedule 1: General Conditions.
5. The material deposited shall comprise only:
 - (a) inert materials, being rock, stones, gravel, sand, silt, clay or soil, provided these are uncontaminated with any hazardous substance; or
 - (b) concrete or cured asphalt.
6. In the event that cured asphalt is deposited, it shall be placed in the land at least one metre above the highest groundwater level expected at the site.
7. The volume of vegetative material in any ten cubic metres of material deposited shall not exceed five percent.
8. Excavation and deposition of material shall not occur in standing water.
9. The consent holder shall prevent sediment and contaminants from flowing into groundwater
10. The consent holder shall prepare an Erosion and Sediment Control Plan (ESCP), and shall submit the ESCP to Canterbury Regional Council, Attention: RMA

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Compliance and Enforcement Manager at least ten working days prior to the commencement of the works.

11. The ESCP shall include, but not be limited to:
 - (a) a map showing the location of all works;
 - (b) detailed plans showing the location of sediment control measures, onsite catchment boundaries, and sources of runoff;
 - (c) measures that shall be undertaken to minimise soil disturbance and prevent soil erosion;
 - (d) measures that shall be undertaken to prevent sediment and contaminants from flowing into groundwater;
 - (e) drawings and specifications of designated sediment control measures;
 - (f) a programme of works, which includes but is not limited to, a proposed timeframe for the works; and
 - (g) inspection and maintenance of the sediment control measures.
12. Erosion and sediment control measures shall be designed, constructed and maintained in accordance with the Canterbury Regional Council Erosion and Sediment Control Guidelines (2007).
13. Erosion and sediment control measures, as specified in the ESCP, shall be installed prior to the commencement of works.
14. Hazardous substances
 - (a) Prior to the first exercise of this consent, the consent holder shall develop a Hazardous Substances Management Plan.
 - (i) The plan shall include a spill response plan, and shall be communicated to all persons undertaking activities authorised by this consent.
 - (ii) A copy of the plan shall be kept on site at all times.
 - (b) The consent holder shall take all practicable measures to avoid spills of fuel or any other contaminant within the site, including the prevention of oil and fuel leaks from vehicles and machinery.
 - (c) There shall be no storage of fuel or refuelling of vehicles and machinery within 20 metres of excavated land.
 - (d) Fuel shall be stored securely or removed from site overnight.
 - (e) A spill kit, that is capable of absorbing the quantity of oil and petroleum products that may be spilled on site at any one time, shall be kept on site at all times.
 - (f) A written spill response plan shall be developed and communicated to all persons undertaking activities authorised by this consent and a copy kept on site at all times.
 - (g) In the event of a spill of fuel or any other contaminant, the consent holder shall clean up the spill as soon as practicable in accordance with the spill response plan detailed in Condition (14)(f) and take measures to prevent a recurrence.

- (h) The consent holder shall inform the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager within 24 hours of a spill event and shall provide the following information:
 - (i) date, time, location and estimated volume of the spill;
 - (ii) cause of the spill;
 - (iii) type of contaminant(s) spilled;
 - (iv) clean up procedures undertaken;
 - (v) details of the steps taken to control and remediate the effects of the spill on the receiving environment;
 - (vi) an assessment of any potential effects of the spill; and
 - (vii) measures to be undertaken to prevent a recurrence.
- 15. All spoil and excavated material from the works shall be removed from site on completion of works or used in development of the site.
- 16. Stock shall be excluded from all excavated areas.

CRC102325 Disturb, excavate, deposit material, remove and plant vegetation in riparian margins: construct supply infrastructure

This application is an amalgamation of applications CRC061820, CRC061822, CRC061843, CRC073034 and CRC073035 and is for construction works. Duration 15 years.

- 1. The works may only occur in the riparian margins of the surface waterbodies listed in Schedules B.1 and B.2 and at the locations listed in Schedules C.1 to C.4.
- 2. This consent shall be subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
- 3. Works shall be limited to:
 - (a) removal of vegetation within 7.5 metres of the watercourses;
 - (b) excavation of land within 7.5 metres of the watercourses;
 - (c) deposition of material within 7.5 metres of the watercourses;
 - (d) installation of structures and associated activities related to the Headrace, Inlet Canal and Water Distribution Network.
 - (e) stabilisation and revegetation of disturbed areas
- 4.
 - (a) At least 20 working days prior to the installation of any structures, the consent holder shall submit to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, final design plans for all structures to be installed.
 - (b) Final design plans shall be peer-reviewed by a chartered professional engineer on the New Zealand register to certify that the proposed structures comply with the conditions contained in Schedule 1: General Conditions. This peer-review shall not be undertaken by the person responsible for the design plans.

5. The structures shall be constructed in accordance with the peer-reviewed and certified final design plans.
6. A certificate signed by a chartered professional engineer on the New Zealand register, certifying that the structures have been constructed in accordance with the final design plans, shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within 20 working days of completion of the construction of each structure.
7. The consent holder shall prepare an Erosion and Sediment Control Plan (ESCP), and shall submit the ESCP to Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager at least ten working days prior to the commencement of the works.
8. The ESCP shall include, but not be limited to:
 - (a) a map showing the location of all works;
 - (b) detailed plans showing the location of sediment control measures, onsite catchment boundaries, and sources of runoff;
 - (c) measures that shall be undertaken to minimise soil disturbance and prevent soil erosion;
 - (d) measures that shall be undertaken to prevent sediment and contaminants from flowing into the watercourses;
 - (e) drawings and specifications of designated sediment control measures;
 - (f) a programme of works, which includes but is not limited to, a proposed timeframe for the works; and
 - (g) inspection and maintenance of the sediment control measures.
9. Erosion and sediment control measures shall be designed, constructed and maintained in accordance with the Canterbury Regional Council Erosion and Sediment Control Guidelines (2007).
10. Erosion and sediment control measures as specified by the ESCP shall be installed prior to the commencement of works..
11. Works shall not cause erosion of the banks and bed of drains and waterways.
12. Hazardous substances
 - (a) Prior to the first exercise of this consent, the consent holder shall develop a Hazardous Substances Management Plan.
 - (i) The plan shall include a spill response plan, and shall be communicated to all persons undertaking activities authorised by this consent.
 - (ii) A copy of the plan shall be kept on site at all times.
 - (b) The consent holder shall take all practicable measures to avoid spills of fuel or any other contaminant within the site, including the prevention of oil and fuel leaks from vehicles and machinery.
 - (c) There shall be no storage of fuel or refuelling of vehicles and machinery within 20 metres of the watercourse.
 - (d) Fuel shall be stored securely or removed from site overnight.

- (e) A spill kit, that is capable of absorbing the quantity of oil and petroleum products that may be spilled on site at any one time, shall be kept on site at all times.
 - (f) A written spill response plan shall be developed and communicated to all persons undertaking activities authorised by this consent and a copy kept on site at all times.
 - (g) In the event of a spill of fuel or any other contaminant, the consent holder shall clean up the spill as soon as practicable in accordance with the spill response plan detailed in Condition (12)(f) and take measures to prevent a recurrence.
 - (h) The consent holder shall inform the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager within 24 hours of a spill event and shall provide the following information:
 - (i) date, time, location and estimated volume of the spill;
 - (ii) cause of the spill;
 - (iii) type of contaminant(s) spilled;
 - (iv) clean up procedures undertaken;
 - (v) details of the steps taken to control and remediate the effects of the spill on the receiving environment;
 - (vi) an assessment of any potential effects of the spill; and
 - (vii) measures to be undertaken to prevent a recurrence.
13. All spoil and excavated material from the works shall be removed from site on completion of works or used in development of the site.

CRC102326 Disturb, excavate, deposit material, remove and plant vegetation in riparian margins: operate and maintain supply works

This application is an amalgamation of applications CRC061820, CRC061822, CRC061843, CRC073034 and CRC073035 and is for operation and maintenance phase works. Duration 35 years.

1. The works may only occur in the riparian margins of the surface waterbodies listed in Schedules B.1 and B.2 and at the locations listed in Schedules C.1 to C.4.
2. This consent shall be subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
3. Works shall be limited to:
 - (a) removal of vegetation within 7.5 metres of the watercourses;
 - (b) excavation of land within 7.5 metres of the watercourses;
 - (c) deposition of material within 7.5 metres of the watercourses;
 - (d) installation of replacement structures and operational or maintenance activities related to the Headrace, Inlet Canal and Water Distribution Network.
 - (e) stabilisation and revegetation of disturbed areas.

4. At least 20 working days prior to the installation of any replacement structures, the consent holder shall submit to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, final design plans for all replacement structures to be installed.
5. Final detailed design plans of replacement structures shall be peer-reviewed by a chartered professional engineer on the New Zealand register to certify that the proposed structures comply with the conditions contained in Schedule 1: General Conditions. This peer-review shall not be undertaken by the person responsible for the design plans.
6. The structures shall be constructed in accordance with the peer-reviewed and certified final design plans.
7. A certificate signed by a chartered professional engineer on the New Zealand register certifying that the replacement structures have been constructed in accordance with the certified final design plans, shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within one month of completion of construction of each structure.
8. The consent holder shall prepare an Erosion and Sediment Control Plan (ESCP), and shall submit the ESCP to Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager at least ten working days prior to the commencement of the works.
9. The ESCP shall include, but not be limited to:
 - (a) a map showing the location of all works;
 - (b) detailed plans showing the location of sediment control measures, onsite catchment boundaries, and sources of runoff;
 - (c) measures that shall be undertaken to minimise soil disturbance and prevent soil erosion;
 - (d) measures that shall be undertaken to prevent sediment and contaminants from flowing into the watercourses;
 - (e) drawings and specifications of designated sediment control measures;
 - (f) a programme of works, which includes but is not limited to, a proposed timeframe for the works; and
 - (g) inspection and maintenance of the sediment control measures.
10. Erosion and sediment control measures shall be designed, constructed and maintained in accordance with the Canterbury Regional Council Erosion and Sediment Control Guidelines (2007).
11. Erosion and sediment control measures as specified in the ESCP shall be installed prior to the commencement of works.
12. Works shall not cause erosion of the banks and bed of drains and waterways.
13. Hazardous substances
 - (a) Prior to the first exercise of this consent, the consent holder shall develop a Hazardous Substances Management Plan.

- (i) The plan shall include a spill response plan, and shall be communicated to all persons undertaking activities authorised by this consent.
 - (ii) A copy of the plan shall be kept on site at all times.
 - (b) The consent holder shall take all practicable measures to avoid spills of fuel or any other contaminant within the site, including the prevention of oil and fuel leaks from vehicles and machinery.
 - (c) There shall be no storage of fuel or refuelling of vehicles and machinery within 20 metres of the watercourse.
 - (d) Fuel shall be stored securely or removed from site overnight.
 - (e) A spill kit, that is capable of absorbing the quantity of oil and petroleum products that may be spilled on site at any one time, shall be kept on site at all times.
 - (f) A written spill response plan shall be developed and communicated to all persons undertaking activities authorised by this consent and a copy kept on site at all times.
 - (g) In the event of a spill of fuel or any other contaminant, the consent holder shall clean up the spill as soon as practicable in accordance with the spill response plan detailed in Condition (13)(f) and take measures to prevent a recurrence.
 - (h) The consent holder shall inform the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager within 24 hours of a spill event and shall provide the following information:
 - (i) date, time, location and estimated volume of the spill;
 - (ii) cause of the spill;
 - (iii) type of contaminant(s) spilled;
 - (iv) clean up procedures undertaken;
 - (v) details of the steps taken to control and remediate the effects of the spill on the receiving environment;
 - (vi) an assessment of any potential effects of the spill; and
 - (vii) measures to be undertaken to prevent a recurrence.
14. All spoil and excavated material from the works shall be removed from site on completion of works or used in development of the site.

CRC102328 To disturb and excavate the bed of a river to place structures

This application is an amalgamation of applications CRC061846 and CRC061847 and is for construction phase works. Duration 15 years.

To erect structures associated with the Inlet Canal, Headrace Canal, and Water Distribution Network, including siphons, pipes, and erosion protection structures, and associated bed excavation and disturbance, in, on, under, or over the beds of the surface waterbodies listed in Schedules B.1, B.2., C.1, C.2, C.3 and C.4

Proposed Conditions:

1. The works carried out in accordance with condition (2) shall be located at the surface waterbodies listed in Schedules B.1, B.2, C.1, C.2, C.3 and C.4 attached to this consent.
2. The works shall be limited to those necessary for the construction of the Inlet Canal, Headrace Canal and Water Distribution Network Structures, including:
 - (a) installation of erosion and sediment control measures;
 - (b) removal of vegetation;
 - (c) excavation of the bed and riparian margins;
 - (d) installation of siphons, culverts, pipes and erosion protection structures; and
 - (e) stabilisation and revegetation of disturbed areas.
3. This consent is subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
4. At least 20 working days prior to the installation of any structures, the consent holder shall submit to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, final design plans for all structures to be installed.
5. Final detailed design plans shall be peer-reviewed by a chartered professional engineer on the New Zealand register to certify that the proposed structures will comply with the conditions contained in Schedule 1. This peer-review shall not be undertaken by the person responsible for the design plans.
6. The structures shall be constructed in accordance with the peer-reviewed and final design plans.
7. A certificate signed by a chartered professional engineer on the New Zealand register certifying that the structures have been constructed in accordance with the certified final design plans, shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within 20 working days of completion of the construction of each structure.
8. In the event that vehicles or machinery enter water, the consent holder shall undertake all practicable measures to minimise disturbance of the bed.
9. The consent holder shall prepare an Erosion and Sediment Control Plan (ESCP), and shall submit the ESCP to Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager at least ten working days prior to the commencement of the works.
10. The ESCP shall include, but not be limited to:
 - (a) a map showing the location of all works;
 - (b) detailed plans showing the location of sediment control measures, onsite catchment boundaries, and sources of runoff;
 - (c) measures that shall be undertaken to minimise soil disturbance and prevent soil erosion;
 - (d) measures that shall be undertaken to prevent sediment and contaminants from flowing into the surface waterbodies;
 - (e) drawings and specifications of designated sediment control measures;

- (f) a programme of works, which includes but is not limited to, a proposed timeframe for the works; and
 - (g) inspection and maintenance of the sediment control measures.
11. Erosion and sediment control measures shall be designed, constructed and maintained in accordance with the Canterbury Regional Council Erosion and Sediment Control Guidelines (2007).
 12. Erosion and sediment control measures as specified in the ESCP shall be installed prior to the commencement of works.
 13.
 - (a) The consent holder shall take all practicable measures to ensure that the works do not cause erosion of the banks and bed of the watercourses, or deflect floodwaters into the berm.
 - (b) In the event of any erosion occurring to the bed or banks of the river as a result of the works or structure, the consent holder shall be responsible for rectifying the situation as soon as practicable.
 14. There shall be no storage or refuelling of vehicles and machinery within 20 metres of the bed of the river.
 15. Apart from structures constructed under this consent, work sites shall as far as practicable be left in a state consistent with the surrounding natural river bed on the completion of works.
 16.
 - (a) All structures shall be maintained in good working order.
 - (b) The structures shall be repaired if damaged, if the structure is damaged beyond repair, then the existing structure shall be removed and may be replaced.
 - (c) Any debris blocking pipes or culverts shall be removed from the watercourse.
 - (d) In the event of any damage to structures, the consent holder shall maintain the flood carrying capacity of the watercourse, and take all practicable measures to minimise erosion.

CRC102329 To disturb and excavate the bed of a river to operate, repair and maintain structures

This application is an amalgamation of applications CRC061846 and CRC061847 and is for operation and maintenance phase works. Duration 35 years.

To maintain, repair and/or replace discharge structures and erosion protection structures and to carry out associated excavation and disturbance, in, on, under, and over the bed of the surface waterbodies listed in Schedules B.1, B.2, C.1, C.2, C.3 and C.4. The structures and works will be associated with the operation and maintenance of the inlet Canal, Headrace Canal, and Water Distribution Race Network. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The works carried out in accordance with condition (2) shall be located at the surface waterbodies listed in Schedules B.1, B.2, C.1, C.2, C.3 and C.4 attached to this consent, and shown on the attached Plans CRC102329.
2. The works shall be limited to those necessary for the operation and maintenance of the Inlet Canal, Headrace Canal and Water Distribution Network Structures, including:
 - (a) installation of erosion and sediment control measures;
 - (b) removal of vegetation;
 - (c) excavation of the bed and riparian margins;
 - (d) maintenance of siphons, culverts, pipes and erosions protection structures;
 - (e) stabilisation and revegetation of disturbed areas.
3. This consent is subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
4. At least 20 working days prior to the installation of any structures, the consent holder shall submit to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, final design plans for all structures to be installed.
5. Final detailed design plans shall be peer-reviewed by a chartered professional engineer on the New Zealand register to certify that the proposed structures will comply with the conditions contained in Schedule 1. This peer-review shall not be undertaken by the person responsible for the design plans.
6. The structures shall be constructed in accordance with the peer-reviewed and certified final design plans.
7. A certificate signed by a chartered professional engineer on the New Zealand register certifying that the structures have been constructed in accordance with the certified final design plans, shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within 20 working days of completion of the construction of each structure.
8. The consent holder shall provide a bond in favour of the Canterbury Regional Council to secure performance of this consent as outlined in Schedule 3 attached.
9. In the event that vehicles or machinery enter water, the consent holder shall undertake all practicable measures to minimise disturbance of the bed.
10. The consent holder shall prepare an Erosion and Sediment Control Plan (ESCP), and shall submit the ESCP to Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager at least ten working days prior to the commencement of the works.
11. The ESCP shall include, but not be limited to:
 - (a) a map showing the location of all works;
 - (b) detailed plans showing the location of sediment control measures, onsite catchment boundaries, and sources of runoff;
 - (c) measures that shall be undertaken to minimise soil disturbance and prevent soil erosion;

- (d) measures that shall be undertaken to prevent sediment and contaminants from flowing into the surface waterbodies;
 - (e) drawings and specifications of designated sediment control measures;
 - (f) a programme of works, which includes but is not limited to, a proposed timeframe for the works; and
 - (g) inspection and maintenance of the sediment control measures.
12. Erosion and sediment control measures shall be designed, constructed and maintained in accordance with the Canterbury Regional Council Erosion and Sediment Control Guidelines (2007).
13. Erosion and sediment control measures as specified in the ESCP shall be installed prior to the commencement of works.
- 14.
- (a) The consent holder shall take all practicable measures to ensure that the works do not cause erosion of the banks and bed of the watercourses, or deflect floodwaters into the berm.
 - (b) In the event of any erosion occurring to the bed or banks of the river as a result of the works or structure, the consent holder shall be responsible for rectifying the situation as soon as practicable.
15. There shall be no storage or refuelling of vehicles and machinery within 20 metres of the bed of the river.
16. Work sites shall as far as practicable be left in a state consistent with the surrounding natural river bed on the completion of works.
- 17.
- (a) All structures shall be maintained in good working order.
 - (b) The structures shall be replaced or repaired if damaged.
 - (c) Any debris blocking pipes or culverts shall be removed from the watercourse
 - (d) In the event of any damage to structures, the consent holder shall maintain the flood carrying capacity of the watercourse, and take all practicable measures to minimise erosion.

CRC102330 To disturb, excavate and deposit material, and to remove and plant vegetation within the bed and riparian margins of a river for the construction of intake structures.

This application is an amalgamation of CRC061868 and CRC061863 and is for construction phase works. Duration 15 years.

To place structures in the bed of the Rakaia River and Waimakariri River and to excavate, disturb and deposit bed material, remove and plant vegetation to facilitate the construction of the Rakaia water intake system and the Waimakariri water intake system.

Proposed conditions:

1. Locations

- (a) Works to disturb the bed of the Rakaia River shall only be undertaken at or about map reference NZMS 260 K36: 071-391.
 - (b) Works to disturb the bed of the Waimakariri River shall only be undertaken at or about map reference NZMS 260 L35: 252-678.
2. Works shall be confined to the area shown on the accompanying plan Central Plains Water Enhancement Scheme – Designation Maps 3, 4 and 10.
3. Works shall be limited to those which are necessary to construct the intake system required to facilitate the taking of water authorised by resource consents CRC061940 and CRC021091, including:
 - (a) erection of structures in the bed of the rivers;
 - (b) excavating, disturbing and depositing material in the bed of the rivers;
 - (c) removal of debris, removal or trimming trees within the footprint of the intake system as identified in final design plans to be provided in accordance with condition (8);
4. The activities authorised by this consent are subject to the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions, attached to this consent.
5. The consent holder shall provide a bond in favour of the Canterbury Regional Council to secure performance of this consent as outlined in Schedule 3 attached.
6. The works shall not disturb existing river protection works in the Kimberley Cliff to Redmonds Road reach unless the consent holder has obtained the prior approval of the Regional Engineer at Canterbury Regional Council.
7. There shall be no activities undertaken by the consent holder in the bed of the Waimakariri River at the Intake Site that would adversely affect the ability of Waimakariri Irrigation Ltd to train the river towards its intake and the Waimakariri District Council stockwater scheme intake at Browns Rock.
8. At least 20 working days prior to the installation of any structures, the consent holder shall submit to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, final design plans for all structures to be installed.
9. Final detailed design plans shall be peer-reviewed by a chartered professional engineer on the New Zealand register to certify that the proposed structures will comply with the conditions contained in Schedule 1. This peer-review shall not be undertaken by the person responsible for the design plans
10. The structures shall be constructed in accordance with the peer-reviewed and certified final design plans.
11. A certificate signed by a chartered professional engineer on the New Zealand register certifying that the structures have been constructed in accordance with the certified final design plans, shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within one month of completion of construction of each structure.
12. The consent holder shall prepare an Erosion and Sediment Control Plan (ESCP), and shall submit the ESCP to Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager at least ten working days prior to the commencement of the works.

13. The ESCP shall include, but not be limited to:
- (a) a map showing the location of all works;
 - (b) detailed plans showing the location of sediment control measures, onsite catchment boundaries, and sources of runoff;
 - (c) measures that will be undertaken to minimise soil disturbance and prevent soil erosion;
 - (d) measures that will be undertaken to prevent sediment and contaminants from flowing into the Rakaia and Waimakariri Rivers;
 - (e) drawings and specifications of designated sediment control measures;
 - (f) a programme of works, which includes but is not limited to, a proposed timeframe for the works; and
 - (g) inspection and maintenance of the sediment control measures.
14. Erosion and sediment control measures shall be designed, constructed and maintained in accordance with the Canterbury Regional Council Erosion and Sediment Control Guidelines (2007).
15. Erosion and sediment control measures as specified in the ESCP shall be installed prior to the commencement of works.
- 16.
- (a) The consent holder shall take all practicable measures to ensure that the works do not cause erosion of the banks and bed of the watercourses, or deflect floodwaters into the berm.
 - (b) In the event of any erosion occurring to the bed or banks of the river as a result of the works or structure, the consent holder shall be responsible for rectifying the situation as soon as practicable.
17. There shall be no storage or refuelling of vehicles and machinery within 20 metres of the bed of the river.
18. Apart from structures constructed under this consent, work sites shall as far as practicable be left in a state consistent with the surrounding natural river bed on the completion of works.
- 19.
- (a) Works and any planting undertaken shall not decrease the flood carrying capacity of the Rakaia River or the Waimakariri River, or encroach into any active channel.
 - (b) Works and planting in the riverbed shall not reduce or prevent the ability of existing river channels to be navigated by boats, or obstruct the passage of aquatic fauna.
20. Wherever access to the riverbed is gained across a stopbank, the consent holder shall ensure that whenever they use the access there is at least 200 millimetres of gravel on top of the crest of the stopbank, as indicated by plan CRC061863.

Note: This consent does not grant access to the construction areas. This must be arranged with the landowner.

21. Any gravel, sand and other natural material excavated during the construction of new channels shall occur as follows:

- (a) Stockpiled material shall not exceed a height of 1.5 metres above the level of the adjacent riverbed.
- (b) Stockpiles shall be positioned and aligned so as to not deflect the flow of the river onto adjoining land, river banks, stopbanks, flood protection works or structures.
- (c) Stockpiles shall be removed within ten working days after the completion of the works.

22. Works within the river bed shall not result in an increase in turbidity or reduction in clarity of the river flow which, in the opinion of a suitably qualified expert, hinders the upstream passage of salmon in the Highbank salmon bypass channel.

Comment [A2]: See attached report

23. Prior to the works in the river authorised by this consent, the consent holder shall commission a suitably qualified salmon fisheries expert, with a bachelors degree in biological sciences, with post graduate qualifications in freshwater fish, to develop a Diversion and Discharge Management Plan (the Plan). The purpose of the Plan is to ensure the works and discharges in the Rakaia River by the consent holder do not hinder upstream passage of salmon in the Highbank salmon bypass channel and to ensure compliance with condition 22 of this consent. The Plan shall be developed in consultation with the operator of the Highbank Power Station, which as a minimum shall require that the consent holder forward a copy of the Plan to the operator of the Highbank Power Station seeking their comment not less than 20 working days prior to submitting the Plan to the Canterbury Regional Council in accordance with condition 24 of this consent and any comments received shall be taken into account when preparing the Plan and forwarded to the Canterbury Regional Council along with the Plan. The Plan shall include the following:

Comment [wjl3]: I think you want an 'or' here?

- (a) An outline of operational requirements of discharges back to the Rakaia River to ensure upstream passage of salmon in the Highbank salmon bypass channel is not hindered.
- (b) A monitoring programme to determine whether or not salmon passage in the Highbank salmon bypass channel is affected, including monitoring methodology, who may be suitable to undertake the monitoring and the frequency of monitoring
- (c) Methods that may be undertaken to reduce any effects on upstream passage of salmon in the Highbank salmon bypass channel if monitoring indicates that the diversion and/or discharge of water is affecting salmon passage

24. At least 20 working days prior to the consent holder undertaking the works authorised by this consent in the Rakaia River, the consent holder shall submit the Diversion and Discharge Management Plan to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager for their approval that the Plan meets the requirements set out in condition 23.

25. The consent holder shall adhere to the Diversion and Discharge Management Plan at all times.

26. In the event that the monitoring and reporting required in condition 23(b) indicates that the discharge is affecting upstream passage of salmon, then the consent holder shall ensure that the methods specified in 23(c) are implemented to mitigate the effects.

27.

(a) The works in the bed of the Rakaia River authorised by this consent shall not result in a situation where there is not a significant, continuous braid reaching the upstream (inlet) end of the salmon bypass channel of the south bank of the Rakaia River at the Highbank power station tailrace. The amount of water in that river braid shall be sufficient to allow the upstream passage of salmon emerging from the Highbank salmon bypass channel.

(b) If, as a result of the works authorised by this consent, works need to be undertaken to the Highbank salmon bypass channel to maintain an interconnection with a main flow of the Rakaia River to ensure the effective passage of salmon from the bypass back to the river, then the consent holder shall either:

(i) Reimburse the operator of the Highbank Power Station for the costs of the works no later than the 20th of the following month following the request for payment being made, if the operator of the Highbank Power Station has first rectified this situation, or

(ii) Undertake the works to rectify this situation, subject to the works being first approved by the operator of the Highbank Power Station.

28.

(a) The consent holder shall, in consultation with the Regional Engineer at the Canterbury Regional Council, commission a suitably qualified Rivers Engineer to undertake an assessment to ensure that the river protection for the Waimakariri River and the Rakaia River is maintained at no less than the current standards both during construction activities and post commissioning of the Central Plains Water Enhancement Scheme.

(b) The Rivers Engineer shall, no less than 24 months post commissioning, undertake a further investigation on the effects of the scheme on the works or activities that are under the control of the Canterbury Regional Council.

(c) The Rivers Engineer shall submit a report to the Canterbury Regional Council: Attention: RMA Compliance and Enforcement Manager, and Attention: Regional Engineer, confirming that the works will not have an adverse effect on works or activities that are under the control of the Canterbury Regional Council, or recommending further river protection works that will need to be undertaken by the consent holder.

(d) The consent holder shall undertake any further river protection works recommended by the River Engineers in the report submitted under condition 28(c).

29.

- (a) The works shall not prevent access to and along the Rakaia and Waimakariri Rivers.
 - (b) All practicable measures shall be undertaken to maintain existing access points, both vehicle and walking, to and along the Rakaia and Waimakariri Rivers.
 - (c) If existing access points to the Rakaia and Waimakariri Rivers are considered to be unsafe due to the exercise of this consent, the consent holder shall provide an alternative access point to and along the affected reaches of the rivers, near to the existing access point. Any new access points shall be suitable to be used by four-wheel drive vehicles.
30. Access to the river in the form of a bridge, culvert or ford suitable to allow access to the riverbed for construction and four-wheel-drive vehicles, shall be installed across the diversion and discharge channels, and shall be maintained at all times.
31. Plants in riverbeds
- (a) The consent holder shall not introduce any plants listed in Schedule BLR1 of the PNRRP: Pest Species (attached to this consent) to the bed or banks of the Rakaia River or Waimakariri River.
 - (b) Any plants introduced to the bed and banks of the Rakaia or Waimakariri Rivers as part of the Landscape and Rehabilitation Plan submitted in accordance with Schedule 1: General Conditions shall not spread beyond the landscaping zones defined in the Landscape and Rehabilitation Plan.
 - (c) The consent holder shall commission a suitably qualified terrestrial plant ecologist, with a tertiary degree in ecology to certify that the plants identified in the Landscape Plan are not listed in Schedule BLR1 of the Natural Resources Regional Plan, and will not spread beyond the landscaping zone defined in the Landscape and Rehabilitation Plan.
 - (d) The consent holder shall submit a certificate from the expert in condition 31(c), certifying that plants in the Landscape and Rehabilitation Plan will not spread beyond the landscaping zone, to the Canterbury Regional Council, Attention: Compliance and Enforcement Manager prior to any plants being planted in the bed of the Rakaia River or the Waimakariri River.
 - (e) The consent holder shall commission a suitably qualified terrestrial plant ecologist with a tertiary degree in ecology to undertake an annual survey by 31 August for at least five years after all plants planted in accordance with the Landscape and Rehabilitation Plan have reached seeding age, and thereafter at five yearly intervals, to identify any plants that may have spread beyond the landscaping zone and whether or not the plants have reached seeding age.
 - (f) The consent holder shall remove any plants that have spread beyond the landscaping zone, as identified in the survey within 10 working days on the completion of the plant survey.
 - (g) The consent holder shall, within 20 working days on the completion of the plant survey required by condition 31(e), submit to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, a report detailing the results of the survey and any removal of plants as required by condition 31(f).

CRC102331 To disturb, excavate and deposit, and to remove and plant vegetation within the bed and riparian margins of a river for the operation and maintenance of intake structures.

This application is an amalgamation of CRC061868 and CRC061863 and is for operation and maintenance phase works. Duration: 35 years

To place structures in the bed of the Waimakariri River and Rakaia River and to excavate, disturb and deposit bed material, remove and plant vegetation to facilitate the operation and maintenance of the Waimakariri water intake system and the Rakaia water intake system.

1.
 - (a) Works to disturb the bed of the Rakaia River shall only be undertaken at or about map reference NZMS 260 K36: 071-391.
 - (b) Works to disturb the bed of the Waimakariri River shall only be undertaken at or about map reference NZMS 260 L35: 252-678.
2. Works shall be confined to the area shown on the accompanying plan Central Plains Water Enhancement Scheme – Designation Maps 3, 4 and 10.
3. Works shall be limited to those which are necessary to operate and maintain the intake systems required to divert and take water as authorised by resource consents CRC061940 and CRC021091, including the:
 - (a) repair and replacement of structures in the bed of the rivers;
 - (b) excavating, disturbing and depositing material in the bed of the rivers; and/or
 - (c) removal of debris, removal or trimming trees within the footprint of the intake system.
4. The activities authorised by this consent are subject the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions, which forms part of this consent.
5. The works shall not disturb existing river protection works in the Kimberley Cliff to Redmonds Road reach unless the consent holder has obtained the prior approval of the Regional Engineer at Canterbury Regional Council.
6. There shall be no activities undertaken by the consent holder in the bed of the Waimakariri River at the Intake Site that would adversely affect the ability of Waimakariri Irrigation Ltd to train the river towards its intake and the Waimakariri District Council stockwater scheme intake at Browns Rock.
7. The consent holder shall provide a bond in favour of the Canterbury Regional Council to secure performance of this consent as outlined in Schedule 3 attached.
8. The consent holder shall prepare an Erosion and Sediment Control Plan (ESCP), and shall submit the ESCP to Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager at least ten working days prior to the commencement of the works.
9. The ESCP shall include, but not be limited to:

- (a) a map showing the location of all works;
 - (b) detailed plans showing the location of sediment control measures, onsite catchment boundaries, and sources of runoff;
 - (c) measures that will be undertaken to minimise soil disturbance and prevent soil erosion;
 - (d) measures that will be undertaken to prevent sediment and contaminants from flowing into the Rakaia and Waimakariri Rivers;
 - (e) drawings and specifications of designated sediment control measures;
 - (f) a programme of works, which includes but is not limited to, a proposed timeframe for the works; and
 - (g) inspection and maintenance of the sediment control measures.
10. Erosion and sediment control measures shall be designed, constructed and maintained in accordance with the Canterbury Regional Council Erosion and Sediment Control Guidelines (2007).
11. Erosion and sediment control measures as specified in the ESCP shall be installed prior to the commencement of works.
- 12.
- (a) The consent holder shall take all practicable measures to ensure that the works do not cause erosion of the banks and bed of the watercourses, or deflect floodwaters into the berm.
 - (b) In the event of any erosion occurring to the bed or banks of the river as a result of the works or structure, the consent holder shall be responsible for rectifying the situation as soon as practicable.
13. Vehicles shall not enter river channels containing flowing water.
14. There shall be no storage or refuelling of vehicles and machinery within 20 metres of the bed of the river.
15. Apart from structures constructed under this consent work sites shall as far as practicable be left in a state consistent with the surrounding natural river bed on the completion of works.
16. Works shall not increase the potential for flooding on surrounding land
17. Works and any planting undertaken shall not decrease the flood carrying capacity of the Rakaia and Wamakariri Rivers or encroach into any active channel.
18. In-river works and plantings shall not reduce or prevent the ability of existing river channels to be navigated by boats, or obstruct the passage of aquatic fauna.
19. Wherever access to the riverbed is gained across a stopbank, the consent holder shall ensure that whenever they use the access there is at least 200 millimetres of gravel on top of the crest of the stopbank, as indicated by plan CRC061868.

Note: This consent does not grant access to the extraction area. This must be arranged with the landowner.

20. Any gravel, sand and other natural material excavated during the construction of new channels shall occur as follows:

- (a) Stockpiled material shall not exceed a height of 1.5 metres above the level of the adjacent riverbed.
- (b) Stockpiles shall be positioned and aligned so as to not deflect the flow of the river onto adjoining land, river banks, stopbanks, flood protection works or structures.
- (c) Stockpiles shall be removed by 10 working days after the date of completion of the operation or maintenance activity.

21.

- (a) The consent holder shall, in consultation with the Regional Engineer at the Canterbury Regional Council, commission a suitably qualified Rivers Engineer to undertake an assessment to ensure that the river protection for the Waimakariri River and the Rakaia River is maintained at no less than the current standards both during construction activities and post commissioning of the Central Plains Water Enhancement Scheme.
- (b) The Rivers Engineer shall, no less than 24 months post commissioning, undertake a further investigation on the effects of the scheme on the works or activities that are under the control of the Canterbury Regional Council.
- (c) The Rivers Engineer shall submit a report to the Canterbury Regional Council: Attention: RMA Compliance and Enforcement Manager, and Attention: Regional Engineer, confirming that the works will not have an adverse effect on works or activities that are under the control of the Canterbury Regional Council, or recommending further river protection works that will need to be undertaken by the consent holder.
- (d) The consent holder shall undertake any further river protection works recommended by the River Engineers in the report submitted under condition 21(c).

22.

- (a) The works shall not impede existing access to and along the Rakaia River and the Waimakariri River.
- (b) All practicable measures shall be undertaken to maintain existing access points, both vehicle and walking, to and along the Rakaia and Waimakariri Rivers
- (c) If existing access points to the Rakaia and Waimakariri Rivers are considered to be unsafe due to the exercise of this consent, the consent holder shall provide an alternative access point to and along the affected reaches of the rivers, near to the existing access point. Any new access points shall be suitable to be used by four-wheel drive vehicles.

23. Access to the river in the form of a bridge, culvert or ford, suitable to allow access to the riverbed for construction vehicles and four-wheel-drive vehicles, shall be installed across the diversion and discharge channels, and shall be maintained at all times.

24. Works within the river bed shall not result in an increase in turbidity or reduction in clarity of the river flow which, in the opinion of a suitably qualified expert, hinders the upstream passage of salmon in the Highbank salmon bypass channel.

25. Prior to the works in the river authorised by this consent, the consent holder shall commission a suitably qualified salmon fisheries expert, with a bachelors degree in biological sciences, with post graduate qualifications in freshwater fish, to develop a Diversion and Discharge Management Plan (the Plan). The purpose of the Plan is to ensure the works and discharges in the Rakaia River by the consent holder do not hinder upstream passage of salmon in the Highbank salmon bypass channel and to ensure compliance with condition 24 of this consent. The Plan shall be developed in consultation with the operator of the Highbank Power Station, which as a minimum shall require that the consent holder forward a copy of the Plan to the operator of the Highbank Power Station seeking their comment not less than 20 working days prior to submitting the Plan to the Canterbury Regional Council in accordance with condition 26 of this consent and any comments received shall be taken into account when preparing the Plan and forwarded to the Canterbury Regional Council along with the Plan. The Plan shall include the following:
- (a) An outline of operational requirements of discharges back to the Rakaia River to ensure upstream passage of salmon in the Highbank salmon bypass channel is not hindered.
 - (b) A monitoring programme to determine whether or not salmon passage in the Highbank salmon bypass channel is affected, including monitoring methodology, who may be suitable to undertake the monitoring and the frequency of monitoring
 - (c) Methods that may be undertaken to reduce any effects on upstream passage of salmon in the Highbank salmon bypass channel if monitoring indicates that the diversion and/or discharge of water is affecting salmon passage
26. At least 20 working days prior to the consent holder undertaking the works authorised by this consent in the Rakaia River, the consent holder shall submit the Diversion and Discharge Management Plan to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager for their approval that the Plan meets the requirements set out in condition 25.
27. The consent holder shall adhere to the Diversion and Discharge Management Plan at all times.
28. In the event that the monitoring and reporting required in condition 25(b) indicates that the discharge is affecting upstream passage of salmon, then the consent holder shall ensure that the methods specified in 25(c) are implemented to mitigate the effects.
- 29.
- (a) The works in the bed of the Rakaia River authorised by this consent shall not result in a situation where there is not a significant, continuous braid reaching the upstream (inlet) end of the salmon bypass channel of the south bank of the Rakaia River at the Highbank power station tailrace. The amount of water in that river braid shall be sufficient to allow the upstream passage of salmon emerging from the Highbank salmon bypass channel.

- (b) If, as a result of the works authorised by this consent, works need to be undertaken to the Highbank salmon bypass channel to maintain an interconnection with a main flow of the Rakaia River to ensure the effective passage of salmon from the bypass back to the river, then the consent holder shall either:
- (i) Reimburse the operator of the Highbank Power Station for the costs of the works no later than the 20th of the following month following the request for payment being made, if the operator of the Highbank Power Station has first rectified this situation, or
 - (ii) Undertake the works to rectify this situation, subject to the works being first approved by the operator of the Highbank Power Station.

30. Plants in riverbeds

- (a) The consent holder shall not introduce any plants listed in Schedule BLR1 of the PNRRP: Pest Species (attached to this consent) to the bed or banks of the Rakaia River or Waimakariri River.
- (b) Any plants introduced to the bed and banks of the Rakaia or Waimakariri Rivers as part of the Landscape and Rehabilitation Plan submitted in accordance with Schedule 1: General Conditions shall not spread beyond the landscaping zones defined in the Landscape and Rehabilitation Plan.
- (c) The consent holder shall commission a suitably qualified terrestrial plant ecologist, with a tertiary degree in ecology to certify that the plants identified in the Landscape Plan are not listed in Schedule BLR1 of the PNRRP, and will not spread beyond the landscaping zone defined in the Landscape and Rehabilitation Plan.
- (d) The consent holder shall submit a certificate from the expert in condition 30(c), certifying that plants in the Landscape and Rehabilitation Plan will not spread beyond the landscaping zone, to the Canterbury Regional Council, Attention: Compliance and Enforcement Manager prior to any plants being planted in the bed of the Rakaia River or the Waimakariri River.
- (e) The consent holder shall commission a suitably qualified terrestrial plant ecologist with a tertiary degree in ecology to undertake an annual survey by 31 August for at least five years after all plants planted in accordance with the Landscape and Rehabilitation Plan have reached seeding age, and thereafter at five yearly intervals, to identify any plants that may have spread beyond the landscaping zone and whether or not the plants have reached seeding age.
- (f) The consent holder shall remove any plants that have spread beyond the landscaping zone, as identified in the survey within 10 working days on the completion of the plant survey.
- (g) The consent holder shall, within 20 working days on the completion of the plant survey required by condition 30(e), submit to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, a report detailing the results of the survey and any removal of plants as required by condition 30(f).

Water Consents

CRC061768 Dam and divert water during construction

To dam and divert water during construction of the Headrace and Water Distribution Network, including constructing siphons, pipes, and erosion protection structures or works, in the surface waterbodies identified in Schedules B.1 and B.2. A consent with a duration of 15 years is sought.

Proposed conditions:

1. The temporary damming and diversion of water shall only be located in the surface waterbodies listed in Schedules B.1 and B.2 attached to this consent and as shown on attached Plan CRC061768.
2. The temporary damming and diversion of water shall only occur during the construction of the Headrace and Water Distribution Network to create a dry working area for the purpose of exercising resource consents CRC102328 and CRC102330 .
3. The diversion and temporary damming of water shall be undertaken in accordance with the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.
4. The diversion shall not obstruct or alter the passage of water in a manner that causes:
 - (a) an increase in the risk or potential for flooding of surrounding lands;
 - (b) destabilisation of lawfully established flood control structures or any other lawfully established structures within the beds of rivers;
 - (c) an increase in erosion of river beds or banks
5. The diversion and temporary damming shall not prevent the passage of fish or cause the stranding of fish in pools or channels.

CRC061940 Divert water from the Rakaia River for irrigation, sediment sluicing and fish passage

To divert water within the Rakaia River towards the Rakaia water intake system to enable the taking of water from the Rakaia River for irrigation and ancillary purposes, and for sediment sluicing and fish pass purposes within the Rakaia water intake system and through the headrace canal and distribution network as described in Schedules A1 and A2. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The diversion of water shall only be located in the Rakaia River between map references NZMS 260 K36:078-387 labelled "diversion point" on attached Plan CRC061940.
2. At the time of diversion works occurring in accordance with consent CRC102331, water may be diverted at a rate not exceeding 80 cubic metres per second.

Comment [A4]: As per para 15.1 of Min 15

3. The rate at which water is diverted shall be kept to the minimum practicable flow that is reasonably required for scheme operations including for irrigation, fish return and sediment flushing.
4. The diversion shall not prevent the passage of fish, or cause the stranding of fish in pools or channels
5. The diversion shall not obstruct or alter the passage of water in a manner that causes:
 - (a) an increase in the risk or potential for flooding of surrounding lands;
 - (b) destabilisation of lawfully established structures within the beds of rivers;
 - (c) a increase in erosion of river beds or banks;
6. The diversion of water shall be undertaken in accordance with the conditions in Schedule 2: Administrative Conditions attached to this consent.
7. The diversion of water shall not result in an increase in turbidity or reduction in clarity of the river flow which, in the opinion of a suitably qualified expert, hinders the upstream passage of salmon in the Highbank salmon bypass channel
8.
 - (a) Prior to the commencement of the diversion of water, the consent holder shall commission a suitably qualified salmonid fisheries expert, with post-graduate qualifications in aquatic sciences, or an expert with extensive experience in salmonid fishery science or management, to develop a Diversion and Discharge Management Plan (the Plan). The purpose of the Plan is to ensure the works and discharges in the Rakaia River by the consent holder do not hinder upstream passage of salmon in the Highbank salmon bypass channel and to ensure compliance with condition 7 of this consent.
 - (b) The Plan shall be developed in consultation with the operator of the Highbank Power Station, which as a minimum shall require that the consent holder forward a copy of the Plan to the operator of the Highbank Power Station seeking their comment not less than 20 working days prior to submitting the Plan to the Canterbury Regional Council in accordance with condition 9 of this consent and any comments received shall be taken into account when preparing the Plan and forwarded to the Canterbury Regional Council along with the Plan. The Plan shall include the following:
 - (i) an outline of operational requirements of discharges back to the Rakaia River to ensure upstream passage of salmon in the Highbank salmon bypass channel is not hindered;
 - (ii) a monitoring programme to determine whether or not salmon passage in the Highbank salmon bypass channel is affected, including monitoring methodology, who may be suitable to undertake the monitoring and the frequency of monitoring; and
 - (iii) methods that is required to reduce any effects on upstream passage of salmon in the Highbank salmon bypass channel if monitoring indicates that the diversion and/or discharge of water is affecting salmon passage..
9. Prior to the diversion of water in the Rakaia River, the consent holder shall submit the Plan to the Canterbury Regional Council, Attention: RMA Compliance and

Enforcement Manager for their approval that the Plan meets the requirements set out in condition 8.

10. The consent holder shall adhere to the Diversion and Discharge Management Plan at all times.
11. In the event that the monitoring and reporting required in condition 8(b) indicates that the discharge is affecting upstream passage of salmon, then the consent holder shall ensure that the methods specified in 8(c) are implemented to mitigate the effects.
12.
 - a. The diversion of water shall not result in a situation where there is not a significant, continuous braid reaching the upstream (inlet) end of the salmon bypass channel of the south bank of the Rakaia River at the Highbank power station tailrace. The amount of water in that river braid shall be sufficient to allow the upstream passage of salmon emerging from the Highbank salmon bypass channel.
 - b. If, as a result of the diversion of water authorised by this consent, works need to be undertaken to the Highbank salmon bypass channel to maintain an interconnection with a main flow of the Rakaia River to ensure the effective passage of salmon from the bypass back to the river, then the consent holder shall either:
 - i. Reimburse the operator of the Highbank Power Station for the costs of the works no later than the 20th of the following month following the request for payment being made, if the operator of the Highbank Power Station has first rectified this situation, or
 - ii. Undertake the works to rectify this situation, subject to the works being first approved by the operator of the Highbank Power Station.
13. The consent holder shall ensure that the freeboard of the headrace is a minimum of 0.75 metres.
14. A copy of this resource consent shall be given to every person involved in the construction, operation and maintenance of the headrace prior to their involvement.
15. The consent holder shall engage a Chartered Professional Engineer with experience in water retaining structures to certify that the design of the headrace and its construction are in accordance with good engineering practice including being consistent with the NZSOLD Dam Safety Guidelines and the requirements of the Building Act 2004. This certificate shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager prior to the first filling of the headrace.
16. Prior to first filling of the headrace, a headrace safety assurance plan (safety assurance plan) shall be produced by a recognised engineer, as defined by the Building Act 2004 (recognised engineer), outlining a program of inspections and quality assurance for the headrace. The safety assurance plan shall be developed consistent with the New Zealand Society on Large Dams, New Zealand Dam Safety

Guidelines (NZSOLD) dam safety guidelines and shall be certified by a recognised engineer. The safety assurance plan shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager prior to the first filling of the headrace. The safety assurance plan shall as a minimum:

- (a) be consistent with the principles of the NZSOLD dam safety guidelines and the requirements of the Building Act 2004;
 - (b) address the distinctive safety and structural requirements of both the headrace filling stage and the scheme operational stage;
 - (c) include a monitoring system (which may include piezometers and visual inspections) capable of detecting warning signs reliably and accurately;
 - (d) specify an efficient organisational approach that records, processes, evaluates and reports the observations;
 - (e) include trigger levels for observational results that are considered to require action; and
 - (f) include a strategy of mitigation and actions to be taken in the event of unacceptable observational results such as leakage or slope movements.
17. Certification documents and any reports required under the safety assurance plan shall be submitted to the Canterbury Regional Council, Attention RMA Compliance and Enforcement Manager annually or as required by the safety assurance plan.
18. The consent holder shall adhere to the safety assurance plan at all times.

CRC061943 Divert water from the Waimakariri River for irrigation, sediment sluicing and fish passage

To divert water in the Waimakariri River towards the Waimakariri water intake system to enable the taking of water for irrigation and ancillary purposes, and for sediment sluicing and fish passes within the Waimakariri water intake system and through the headrace canal and distribution network as described in Schedules A1 and A2. A consent with a duration of 35 years is sought.

Proposed conditions:

2. The diversion of water shall only be located in the Waimakariri River at about map reference NZMS 260 L35: 328-603, labelled "diversion point" on attached Plan CRC061943.
3. At the time of diversion works as authorised by consent CRC102331, water may be diverted at a rate not exceeding 40 cubic metres per second.
4. The rate at which water is diverted shall be kept to the minimum practicable flow that is reasonably required for scheme operations such as taking for irrigation, fish return and sediment flushing.
5. The diversion shall not prevent the passage of fish, or cause the stranding of fish in pools or channels

6. The diversion shall not obstruct or alter the passage of water in a manner that causes:
 - (a) an increase in the risk or potential for flooding of surrounding lands;
 - (b) destabilisation of lawfully established structures within the beds of rivers;
 - (c) an increase in erosion of river beds or banks.
7. The diversion of water shall be undertaken in accordance with the conditions in Schedule 2: Administrative Conditions attached to this consent
8. The consent holder shall ensure that the freeboard of the headrace is a minimum of 0.75 metres.
9. A copy of this resource consent shall be given to every person involved in the construction, operation and maintenance of the headrace prior to their involvement.
10. The consent holder shall engage a Chartered Professional Engineer with experience in water retaining structures to certify that the design of the headrace and its construction are in accordance with good engineering practice including being consistent with the NZSOLD Dam Safety Guidelines and the requirements of the Building Act 2004. This certificate shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager prior to the first filling of the headrace.
11. Prior to first filling of the headrace, a headrace safety assurance plan (safety assurance plan) shall be produced by a recognised engineer, as defined by the Building Act 2004 (recognised engineer), outlining a program of inspections and quality assurance for the headrace. The safety assurance plan shall be developed consistent with the New Zealand Society on Large Dams, New Zealand Dam Safety Guidelines (NZSOLD) dam safety guidelines and shall be certified as appropriate by a recognised engineer. The safety assurance plan shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager prior to the first filling of the headrace. The safety assurance plan shall as a minimum:
 - (a) be consistent with the principles of the NZSOLD dam safety guidelines and the requirements of the Building Act 2004;
 - (b) address the distinctive requirements of both the headrace filling stage and the scheme operational stage;
 - (c) include a monitoring system (which may include piezometers and visual inspections) capable of detecting warning signs reliably and accurately;
 - (d) specify an efficient organisational approach that records, processes, evaluates and reports the observations;
 - (e) include trigger levels for observational results that are considered to require action;
 - (f) include a strategy of mitigation and actions to be taken in the event of unacceptable observational results such as leakage or slope movements.
12. Certification documents and any reports required under the safety assurance plan shall be submitted to the Canterbury Regional Council, Attention RMA Compliance and Enforcement Manager annually or as required by the safety assurance plan.

13. The consent holder shall adhere to the safety assurance plan at all times.

CRC061925 Take water for dewatering

To take water for dewatering purposes during construction, operation and maintenance of the two intakes, the Inlet Canal, Headrace Canal, and Water Distribution Network, including for the purposes of constructing, operating and maintaining siphons, pipes, and erosion protection structures/works, in the surface waterbodies identified in Schedules A 3, A 4, B.1 and B.2. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The taking of water for dewatering purposes shall only occur in and adjacent to the surface waterbodies identified in Schedules B.1 and B.2 attached to this consent, as shown on Plan CRC061925 and adjacent to excavated areas for the construction of the Inlet Canal, Headrace Canal and Water Distribution Network.
2. Water shall only be taken in association with the dewatering required to facilitate construction of the Inlet Canal, Headrace Canal, and Water Distribution Race Network (including for the purposes of constructing siphons, pipes, and erosion protection structures/works).
3. The taking of dewatering water shall be undertaken in accordance with the conditions in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions, attached to this consent.
4.
 - (a) The taking of dewatering water as authorised by this consent in combination with all other groundwater takes authorised at the time this consent was granted, shall not cause the water level in any neighbouring bore within 2000 metres of the dewatering site to be lowered by more than 20% of the available drawdown in that bore. For the purposes of this condition, available drawdown is the water level in the bore that is exceeded 80% of the time.
 - (b) The consent holder shall appoint a suitably qualified person to assess the percentage of available drawdown remaining in the neighbouring bores within 2000 metres of the dewatering site. The assessment shall be undertaken in accordance with the methodology outlined in Schedule WQN10 of the PNRRP.

Note: For the purposes of this condition, a suitably qualified person is a person with experience in undertaking assessments in accordance with the methodology outlined in Schedule WQN10 of the Proposed Natural Resources Regional Plan as notified July 2004 (PNRRP),

5.
 - (a) The consent holder shall submit to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager at least one month prior to the exercise of this consent, a Dewatering Management Plan (DMP) outlining the construction and management practices and procedures to be adopted in order to comply with the conditions of this consent and to ensure potential adverse

effects that may arise from the dewatering activities are minimised to the greatest extent practicable.

- (b) The DMP shall include, but not be limited to:
 - (i) details of the construction activities where dewatering will be required, including the location of dewatering activities, the depth of excavation and groundwater levels in the excavated areas;
 - (ii) the types of dewatering methods to be adopted and details of where water will be discharged;
 - (iii) a construction management programme including the construction timetable, the sequence of construction and the duration of each construction phase;
 - (iv) a copy of the assessments undertaken in accordance with condition (4) to determine the available drawdown in bores within 2000 metres of the dewatering sites;
 - (v) the mitigation measures to be adopted if required to minimise the effects of dewatering on surrounding property and infrastructure, including but not limited to measures that will be undertaken to ensure the water levels in any bore within 2000 metres of the dewatering site are not lowered by more than 20% of the available drawdown in that bore and
 - (vi) contact details for the person in charge of the site works.
 - (c) The consent shall be exercised in accordance with the Dewatering Management Plan.
 - (d) The consent holder shall provide an annual report, by 31 August each year, to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, which shows how the consent holder has complied with the DMP.
6. The consent holder may at any time, submit to the Canterbury Regional Council, an amended Dewatering Management Plan for the purposes of improving the efficiency and or quality of the dewatering or to remove or reduce an adverse environmental effect or to relax mitigation requirements where these have been found to be unnecessarily stringent.
7. The Canterbury Regional Council may, once per year, serve notice of its intention to review the conditions of this consent for the purposes of dealing with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage.

CRC061972 Take water from the Waimakariri River at a maximum rate of 24m³/s

This application has had the “use” portion of the application removed. The use of water has been combined with the use of water from the Rakaia River.

To take and use water from the Waimakariri River at a maximum rate of 24 cubic metres per second via the Waimakariri water intake system, for the purposes of irrigation of up to about 60,000 hectares of land within the Scheme Area, for water storage, and for

ancillary purposes associated with the operation of the Central Plains Water Enhancement Scheme. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The intake shall be installed near the upstream edge of the designated band as shown in Plan CRC061972.
2. The rate at which water may be taken from the Waimakariri River shall not exceed 24 cubic metres per second.
3. For the periods excluding the days listed in Appendix 1, water shall only be taken subject to the following:

Comment [U5]: Not clear, needs to be more specific
onger timeframe

- (a) Whenever the unmodified mean flow in the Waimakariri River, as estimated by the Canterbury Regional Council from measurements at the Old Highway Bridge, at or about map reference NZMS 260 M35:818-547, for any 24 hour period ending at noon is:
 - (i) greater than 66.1 cubic metres per second the maximum rate of take during the next 24 hours shall not exceed half the difference between the unmodified mean daily flow and 66.1 cubic metres per second;
 - (ii) at or below 66.1 cubic metres per second no water shall be taken during the next 24 hours, unless water can be taken under clause (a)(iii).
 - (iii) greater than 41.0 cubic metres per second and less than 63.0 cubic metres per second, the consent holder may take unused but allocated A permit water in agreement with water permit holders who are subject to A permit minimum flow restrictions and are adhering to a water sharing regime that restricts the total rate of abstraction from the Waimakariri River whenever the flow is at or above 41.0 cubic metres per second. The consent holder shall provide the Canterbury Regional Council, Attention: Compliance and Enforcement Manager, written agreement with the water permit holders giving permission for the consent holder to take its unused but allocated water.

NOTE: For the purpose of this consent, written agreement must be in the form of an email, fax or signed written document.

- (iv) at or below 41.0 cubic metres per second for a continuous period of 14 days, the consent holder shall not take water in accordance with conditions 3(a)(i) until the flow rate is greater than 41 cubic metres per second for a period of two days or until the flow is greater than 130 cubic metres per second, whichever is the sooner. This clause shall not apply if water is being taken under clause 3(a)(iii).
4. For the periods including the days listed in Appendix 1, the following restrictions shall apply:
 - (a) whenever the unmodified mean flow in the Waimakariri River, as estimated by the Canterbury Regional Council from measurements at the Old Highway Bridge,

at or about map reference NZMS 260 M35:818-547, for any 24 hour period ending at noon is:

- (i) greater than 80 cubic metres per second and less than 95 cubic metres per second, then the take shall not exceed the difference between the unmodified flow and 80 cubic metres per second, or 5 cubic metres per second, whichever is the lesser. This restriction shall apply between the hours of 3pm and 3am, or a similar 12 hour period so that the unmodified flow at Crossbank (located between map references NZMS 260 M35:701511 and M35:701517) between 7am and 7pm is between 55 and 65 cubic metres per second (measured flow).
 - (ii) Greater than 95 cubic metres per second, then take shall not exceed half the difference between the unmodified mean daily flow and 95 cubic metres per second.
5. No water shall be taken during the annual Coast to Coast multi-sport event.
6. This consent shall be exercised only when all the available water that can be taken by the consent holder under CRC021091 is being taken.
7. The abstraction of water at “unmodified” river flows of greater than 66.1 cubic metres per second shall only occur at times when A permit holders are authorised to exercise their full allocation.
8. Fish screens
 - (a) The consent holder shall install and maintain fish screens or deflection barriers on the intake works.
 - (b) The fish screens or deflection barriers shall be installed prior to the abstraction of water authorised by this consent.
9. The fish screens or deflection barriers shall be designed to ensure the adverse effects on all fishery components are no more than minor using best practice design principles of fish screening. In particular, the fish screen design shall achieve the following performance objectives:
 - (a) exclude all adult fish; and
 - (b) exclude at least 95% of juveniles of all fishery components that have entered the intake system; and
 - (c) all excluded fish shall be returned safely to the main stem of the Waimakariri River downstream from the intake; or
 - (d) any other objectives established in consultation with Fish and Game North Canterbury and Department of Conservation as outlined in condition 10(a).

For the purpose of this condition “fishery components” shall be defined as all species of sports fish and native fish that are present in the Waimakariri River or seasonally migrate past the intake.

10. Fish screen approval process

- (a)
 - (i) Prior to designing the fish screens the consent holder shall commission a suitably qualified expert/s to assess the fisheries of the river and provide a report that, in the expert's opinion, confirms the appropriateness of the objectives in condition 9 or provides evidence for the need to amend those objectives.
 - (ii) The report shall identify opportunities where the consent holder may enhance the fisheries of the river in addition to the objectives in condition 9, or in partial or full compensation for any loss of fish that might occur as a result of the water take, or in lieu of the full achievement of the objectives in condition 9.
 - (iii) The consent holder shall consult with Fish and Game North Canterbury and Department of Conservation in preparation of this report;
 - (iv) The consent holder shall submit the report and records of consultation required by condition 10(a)(ii), to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager.
- (b) A person duly authorised by the Canterbury Regional Council shall give written notice to the consent holder stating whether or not it approves of any proposed amendment to the objectives within 20 working days of receipt of the report referred to in condition 10(a), and such approval shall not be unreasonably withheld.
- (c) Prior to the taking of water pursuant to this consent, the consent holder shall install a fish screen ("the Screen") or deflection barrier across the intake designed in accordance with the certified plans approved by a person duly authorised by the Canterbury Regional Council in accordance with Condition 10(h).
- (d) The Screen or deflection barrier shall achieve the objectives of Condition 9 and for the purposes of this condition this shall be achieved by installing, operating and maintaining the Screen or deflection barrier in accordance with the certified design plans referred to in Condition 10(f).
- (e) The design plans for the Screen or deflection barrier shall be certified by:
 - (i) a suitably qualified engineer with experience in the design and operation of fish screens and deflection barriers; and
 - (ii) a fisheries biologist with knowledge of salmonid and native fisheries ("the Certifiers").
- (f) Prior to the commencement of construction of the fish screen or deflection barrier, the consent holder shall provide to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager:
 - (i) the certified design plans including the proposed location of the screen or deflection barrier, screen or deflection barrier slot/aperture size, design sweep velocity, design approach velocity, proposed screen material and an effective by-pass structure and flow which returns fish to an actively flowing braid of the river; and

- (ii) a report from the Certifiers which certifies the design and operation of the screen or deflection barrier:
 - (A) demonstrates best practice in achievement of Condition 10(d); and
 - (B) takes into consideration regional or national guidelines in relation to fish screen and/or deflection barrier design and/or any international guidelines that the Certifiers consider relevant.
 - (iii) The report required in condition f(ii) shall also specify any monitoring requirements for the fish screen.
 - (g) Unless the consent holder has obtained written agreement from the Canterbury Regional Council under condition 10(b), the fish screen shall have, as a minimum requirement, the following provisions:
 - (i) the fish screen shall cross the full width of the irrigation canal to prevent fish bypassing the screen into the canal;
 - (ii) the screen material voids shall be a mesh or with maximum width of 4 millimetres;
 - (iii) the screens shall have a design approach velocity perpendicular to the screen surface of no greater than 0.12 metres per second;
 - (iv) the design sweep velocity across the screens shall exceed the approach velocity;
 - (v) an effective bypass system shall be maintained at all times that water is diverted into the scheme, to ensure unrestricted passage is maintained to and from an active braid of the river; and
 - (vi) an effective operation and maintenance schedule.
 - (h) A person duly authorised by the Canterbury Regional Council shall give written notice to the consent holder stating whether or not it approves of the certified design plans within 20 working days of receipt of the plans and the certifiers' report referred to in Condition 10(f) and such approval shall not be unreasonably withheld.
 - (i) The consent holder shall, prior to commissioning, provide a certificate from a suitably qualified person confirming that construction of the screen or deflection barrier has occurred in accordance with the certified design plans approved in accordance with Condition 10(h).
11. Each fish screen shall be inspected at maximum intervals of two days for any damage causing openings greater than those specified in Condition 10(f)(i), or once every 24 hour period when the flow in the Waimakariri River is greater than 200 cubic metres per second, as estimated by Canterbury Regional Council, from measurements at the Old Highway Bridge (at or about map reference NZMS 260 M35:818-547).
12. In the event that a screen is damaged such that the screen mesh aperture is greater than those specified in Condition 10(f)(i), the screen shall be repaired or replaced as soon as practicable or the damaged screen shut down, and no water shall be taken. Any screen shut down shall not be opened again until a screen that complied with Condition 10(f)(i) is fitted.

13. The incidence of screen shutdowns shall be recorded and reported to the North Canterbury Fish and Game Council as soon as practicable. Records of screen failure shall be forwarded to Canterbury Regional Council by 31 May each year, or as requested

14. Safety at intake

- (a) Prior to the taking of water pursuant to this consent, the consent holder shall design an intake structure that shall, as far as practicable, prevent water users becoming pinned against or washed into the intake on the Waimakairiri River.
- (b) The safety features of the intake structure shall be designed in consultation with the White Water New Zealand and the New Zealand Jet Boat Association.
- (c) The intention of the safety features will be to achieve, if reasonably practicable, an overall International Grade 2 standard suitable for racing kayaks.

For the purpose of this clause, the International Grade 2 standard shall be consistent with the USA Grade 2 definition: "Straightforward rapids with wide, clear channels which are evident without scouting. Occasional manoeuvring may be required, but rocks and medium-sized waves are easily missed by trained paddlers. Swimmers are seldom injured and group assistance, while helpful, is seldom needed."

- (d) The intake design shall incorporate the following:
 - (i) the intake shall be recessed into the face of the rock cliff so that all gates, together with their supports, and at least the upper part of the trash rack are built behind the general natural line of the cliff face,
 - (ii) an inclined trash rack shall be constructed and maintained on the upstream face of the intake gate, leading to a safety ledge and exit point, with exit paths leading both back to the river, where a kayaker may re-enter his/her racing kayak, and away from the river, at the choice of the user. The exit paths shall be such that a person carrying a racing kayak can traverse the path safely. The dimensions of the trash rack shall be such that velocities approaching it do not exceed 1 metre per second. The trash rack shall extend to the bottom of the river bed, except that this condition shall not apply when the river is in flood,
 - (iii) the surfaces presented to the water shall be free from sharp protrusions which could injure a person or snag clothing.
- (e) The design plans for the intake shall be certified by:
 - (i) a suitably qualified person with experience in the design and operation of intake structures (Certifier 1), and
 - (ii) a person with experience in water safety, particularly for recreational boating and kayaking on rivers (Certifier 2).

- (f) Prior to the commencement of construction of the intake structure, the consent holder shall provide to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager:
 - (i) The certified design plans;
 - (ii) A joint report from the Certifier 1 and Certifier 2 which certifies the design and operation of the safety features on the intake structures which demonstrates best practice in achievement of Condition 14(a) to 14(d);
- (g) A person duly authorised by the Canterbury Regional Council shall give written notice to the consent holder stating whether or not it approves of the certified design plans and the certifiers report referred to in Condition 14(f)(ii) within 20 working days of receipt of the plans and report. Such approval shall not be unreasonably withheld.
- (h) The consent holder shall, prior to commissioning, provide a certificate from a suitably qualified person confirming that construction of the intake structure has occurred in accordance with the certified design plans approved in accordance with Condition 14(g).
- (i) The consent holder shall install, operate and maintain an intake structure designed in accordance with the certified plans approved by a person duly authorised by the Canterbury Regional Council in accordance with Condition 14(g).
- (j) Prior to the first exercise of this consent, the consent holder shall erect and maintain two signs warning of the intake structure at two locations upstream from the intake, one sign at the Mt White Bridge carpark and one sign at the Gorge Bridge carpark. The signs shall be visible on the banks and by in-river users and the location, size and wording shall be developed in consultation with White Water New Zealand and to the approval of the Canterbury Regional Council.
- (k) The consent holder shall, as far as is practicable, inform all commercial users and recreational boat clubs of the position of the intake, within one month of the start of construction. A copy of the written notice and a list of those parties notified shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager at least 20 working days prior to the construction on the intake.
- (l) Within six months of commencement of operation the consent holder shall conduct live tests of the intake under a range of river flow conditions and intake flows, and
 - (i) shall invite Whitewater NZ and the New Zealand Jet Boat Association to observe and participate in those tests, and
 - (ii) shall invite Whitewater NZ and the New Zealand Jet Boat Association to comment on potential modifications to design and operation.

- (m) The consent holder shall report to Canterbury Regional Council on the tests required in condition 14(l), including the modifications to design and operation of the intake. In particular, the report shall include:
 - (i) comments made by Whitewater New Zealand and the New Zealand Jet Boat Association; and
 - (ii) a report from the certifiers (as set out in condition 14(e)) which certifies that the modifications to the intake safety features will increase the effectiveness of the safety features to prevent water users being pinned against or washed into the intake structure.
- (n) Within 40 working days, the consent holder shall adopt the modifications to the intake design as identified in the report required in condition 14(m).

15. Measurement of water take.

The consent holder shall, prior to the commencement of this consent:

- (a) install a water measuring device in a location that will enable the determination of the continuous rate of flow and volume of water being diverted to within an accuracy of 10 percent.
- (b) the water measuring device shall, as far as is practicable, be installed at a site likely to retain a stable relationship between flow and water level. The measuring device shall be installed in accordance with the manufacturer's instructions.
- (c) install a tamper-proof electronic recording device such as a data logger(s), which is telemetered, as specified in clause (d).
- (d) The recording device(s) shall be connected to a telemetry system which collects and stores all of the data continuously with an independent network provider who will make that data available in a commonly used format at all times to the Canterbury Regional Council and the consent holder.
- (e) The water measuring and recording devices described in clauses (a) and (b) shall be available for inspection at all times by the Canterbury Regional Council, including access to the data recorded in accordance with clause (c).
- (f) All data from the recording device described in clause (b), and the corresponding relationship between the water measuring device (a(i)), shall be provided to the Canterbury Regional Council annually in the month of June.

Comment [A9]: CPW may propose alternative conditions that allow CPW to be their own network provider.

16. Within six months of the installation of the water measuring or recording device(s), specified in condition 15, or any subsequent replacement water measuring or recording device(s), or at any time when requested by the Canterbury Regional Council, the consent holder shall provide an installation and commissioning form demonstrating by means of a clear diagram, that:

- (a) the water measuring and recording device(s) is installed in accordance with the manufacturers specifications; and

- (b) data from the recording device(s) can be readily accessed and/or retrieved in accordance with clauses (ii) and (iii) of condition 15(d) above.

17. This consent is subject to the conditions listed in Schedule 2: Administrative Conditions.

APPENDIX 1

The restrictions specified in condition (4) of CRC061972, shall occur starting the day prior to:

1. all weekend days and public holidays between 1 November and 15 March; and
2. all weekdays from 21 December to 15 February; and
3. the fourth Monday of October (Labour Day) and the Easter weekend starting Good Friday and ending on Easter Monday.

CRC061973 Use water from the Rakaia River and Waimakariri River at maximum rate of 65m³/s

This application is an amalgamation of CRC061973 and the “use” component of CRC061972.

A consent with a duration of 35 years is sought

1. Water shall only be used for the irrigation of up to approximately 60,000 hectares of land shown on attached Plan CRC061973. Water taken under CRC100581 may also be used under this consent on the same area of land shown on CRC061973.
2. The consent holder shall not authorise or permit any person to act under this resource consent unless that authorised person provides a written undertaking that they will comply with all the conditions of this resource consent, to the same extent as if the resource consent had been granted to that person as well as the consent holder.
3. The consent holder shall:
 - (a) limit bywash discharges and leakage from pipes and structures forming part of the reticulation system that delivers water from the Waimakariri and Rakaia Rivers to the farm supply points such that on average not more than 20% of water taken is lost by bywash discharges and leakage from the total reticulation system between 1 September and the following 30 April; and
 - (b) ensure the implementation and auditing of the Farm Management Plans (FMPs) as described in conditions 8, 9, 10, 11 and 12, and
 - (c) keep a copy of each FMP, and supply any such FMP to the Canterbury Regional Council, on request.
4. The consent holder shall require all properties supplied with irrigation water under this consent to take all practicable steps to:

- (a) ensure that the volume of water used for irrigation does not exceed that required for the soil to reach field capacity; and
 - (b) avoid the application of water onto non-productive land such as impermeable surfaces and river or stream riparian strips, and
 - (c) avoid surface run-off from irrigation, and
 - (d) avoid leakage from pipes and structures.
- 5.
- (a) The maximum application rate shall not exceed 5.18 millimetres per day on a scheme-wide basis.
 - (b) In the event that water authorised for use under this consent is applied to land concurrently with water abstracted from groundwater, the combined volume of water used on that land shall not exceed 6,250 cubic metres per hectare between the 1st July and the following 30th June.
6. Best management practices shall be implemented on all properties receiving water from the scheme to minimise the loss of nitrate-nitrogen to soil drainage water. Best management practices shall be specified in individual farm management plans.
7. Cattle, pigs, and deer shall be excluded from waterways and wetlands (including drains and races) adjoining land being irrigated;
8. Prior to the use of water from the Central Plains Water Enhancement Scheme for irrigation on individual properties, the water users shall prepare an individual Farm Management Plan which shall include:
- (a) details of how the water users will comply with conditions 3 to 7 of this consent;
 - (b) the best management practices implemented on each property to minimise the loss of nitrate-nitrogen to soil drainage water and minimise any loss of sediment, phosphorus or nitrogen to surface waters. The best management practices may include, but not be limited to:
 - (i) split applications of fertiliser
 - (ii) timing of fertiliser application to match plant growth
 - (iii) avoiding application of fertiliser to saturated soil
 - (iv) avoiding applying fertilizer when the soil temperature at 10 cm depth is less than 6°C
 - (v) using nitrification inhibitors
 - (vi) planting winter cover crops
 - (vii) limiting the average total nitrogen (fertiliser and effluent) application to that property.
 - (c) Each property, for each 12 month period ending 30 June shall either:
 - (i) demonstrate via a nutrient budget that the average total nitrogen (fertiliser and effluent) application has been less than 200 kgN/ha/yr; or
 - (ii) use approved methods to undertake calculations or measurements of the average annual concentration of nitrate nitrogen in the soil drainage below

Comment [A10]: lete clause (ii).

the plant root zone. For the purposes of this condition, approved methods shall be:

- A Calculations using either the most recent version of the OVERSEER® model or the most recent version of the Soil Plant Atmosphere Model (SPASMO); or
 - B Any other method of calculation or measurement approved by the Canterbury Regional Council.
- (d) where the average annual concentration of nitrate nitrogen in the soil drainage water below the plant root zone as calculated in accordance with clause 8 (c) (ii) or measured, for the property is between 8 grams per cubic metre and 16 grams per cubic metre, management practices shall be implemented to reduce the loss of nitrate nitrogen to soil drainage water;
- (e) where the average annual concentration of nitrate nitrogen in the soil drainage water below the plant root zone calculated in accordance with clause 8 (c) (ii) or measured, exceeds 16 grams per cubic metre of nitrate nitrogen, the consent holder shall adopt management practices to reduce the loss of nitrate-nitrogen to soil drainage water, including but not limited to:
- (i) A revision of the Farm Management Plan on that property to ensure best management practices are put in place
 - (ii) A review of the on-farm practices to ensure implementation of the FMP,
 - (iii) The management practices specified in condition 8(b); and
 - (iv) the average total nitrogen (fertiliser and effluent) application to that property shall be limited to 200 kgN/ha/yr.
9. The Farm Management Plan shall include the following objectives:
- (a) ensure that all irrigation systems on the property are capable of operating to meet industry and scheme standards for best practice irrigation;
 - (b) maximise water application effectiveness while minimising excess drainage and runoff;
 - (c) minimise the incidence of wind and/or water erosion caused as a result of farming practices;
 - (d) minimise nutrient losses to surface and ground water through the use of nutrient budgeting;
 - (e) minimise nitrate leaching and/or run-off losses to surface and ground water through careful fertiliser management, management of drains, planting of buffer zones around surfacewater bodies (including drains), and the exclusion of stock from all water bodies;
 - (f) minimise phosphate run-off losses to surface water through careful fertiliser management, management of drains, planting of buffer zones around surfacewater bodies (including drains), and the exclusion of stock from all water bodies;
 - (g) apply nutrients where needed to maximise effectiveness and minimise losses to non target areas;

Comment [A10]: ed note.
As per para 16.3 of Min 15
As per pra 16.4 Min 15

Comment [A12]: As per para
16.4 Min 15

- (h) exclude all cattle, pigs and deer from waterways and wetlands (including drains and races);
- (i) minimise soil loss and contamination of waterways; and
- (j) avoid, remedy or mitigate effects on native plants and native animals and their habitats on individual farm properties.

10. Auditing

- (a) The Farm Management Plans shall be audited by a suitably qualified independent assessor appointed by the consent holder. The purpose of the review shall be to ensure that the Farm Management Plan demonstrates achievement of the objectives as set out in condition (9) and demonstrates compliance with conditions (3), (4), (5), (6) and (7) of this consent.
- (b) For the first two years of receiving scheme water each farm plan will be audited annually. After that time each plan will be independently audited, including a site visit, at least once every five years.
- (c) Following each independent audit, the consent holder shall identify any areas of non-compliance with conditions (3), (4), (5), (6) and (7).
- (d) In the event that the areas of non-compliance are identified, the consent holder shall take all practicable steps to ensure that the water users are fully compliant with conditions (3), (4), (5), (6) and (7) as soon as practicable and in any case prior to the next 31 August.

ADVICE NOTE: The Canterbury Regional Council may review any Farm Management Plan to check compliance with conditions (3), (4), (5), (6) and (7).

- 11. By 31 August each year, the consent holder shall provide the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager with a report that summarises the following:
 - (a) the results of the Farm Management Plan review by the independent auditor,
 - (b) any non-compliance with the individual Farm Management Plans and conditions (3), (4), (5), (6) and (7).
 - (c) any steps taken by the consent holder to ensure that corrective actions are put in place to address instances of non-compliance.
- 12. The consent holder shall supply to the Canterbury Regional Council, by 31 August each year, information on the previous irrigation season, including:
 - (a) List of all water users;
 - (b) Actual land areas irrigated from the scheme;
 - (c) Water supplied to each property;
 - (d) Land uses by property on the irrigated land;
- 13. This consent is subject to the conditions listed in Schedule 2: Administrative Conditions.
- 14. The consent holder shall pay 12.5% of the annual costs incurred by the Canterbury Regional Council to open Lake Ellesmere/Te Waihora.

CRC021091 Take water from the Rakaia River at a maximum rate of 40m³/s

Duration: 35 years

1. Water may only be taken from the Rakaia River at or about map reference NZMS 260 K36:072-391 at a maximum rate of 40 cubic metres per second.
2.
 - (a) Except as provided for in condition 3, the maximum combined rate at which water may be taken under this consent and resource consent CRC093683 shall not exceed 33.5 cubic metres per second of Band 5 water.
 - (b) For the purposes of this condition, 33.5 cubic metres per second is the rate at which water may be taken and not discharged back to the river (as required by consent CRC093683).
3. Low flow restrictions
 - (a) Except as provided for in conditions 4 and 5, whenever the mean flow for the 24 hour period ending at noon on any one day (expressed in cubic metres per second) in the Rakaia River, as estimated by Canterbury Regional Council from measurements at either the gorge recorder site (at or about map reference NZMS 260 K35:015-424) or the recorder site at Fighting Hill (at or about map reference NZMS 260 K35:997-437), falls below the following flows (Y m³/s) , the taking of water in terms of this permit shall cease:

Month:	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flow: (Y m ³ /s)	198	182	179	171	169	170	165	166	164	180	203	213

Note: In the event that water in higher priority bands becomes available for allocation to other water users, then the minimum flows in this condition will require amendment to recognise the priority rights of the consent holder. The above minimum flows have been based upon the assumption that the consent holder has priority over Synlait that has applied to take 6 cubic metres per second, otherwise these minimum flows need to be amended.

- (b) Whenever the mean flow for the 24 hour period ending at noon on any one day (expressed as X cubic metres per second) in the Rakaia River, as estimated by Canterbury Regional Council from measurements at either the gorge recorder site (at or about map reference NZMS 260 K35:015-424) or the recorder site at Fighting Hill (at or about map reference NZMS 260 K35:997-437), exceeds the minimum flow Y as contained in condition 2(a), then the combined abstraction under this consent and consent CRC093683 shall not exceed Z m³/s where:

$$1. Z = (X-Y)/2 \quad \text{and} \quad Z < 33.5 \text{ m}^3/\text{s}$$

ADVICE NOTE: the maximum rate at which water may be taken under this consent and consent CRC093683 above the minimum flows specified in condition (2)(b) shall not exceed 33.5 cubic metres.

4. The maximum combined rate at which water may be taken under this consent in combination with resource consents CRC093683, CRC051802.3, CRC051803.2 and CRC990088.3 (or any variations to these consents), including water that will be discharged back to the Rakaia River in accordance with consent CRC093683, shall not exceed 67 cubic metres per second, provided that the consent holder complies with the minimum flow requirements of those consents and water allocation rules in the National Water Conservation (Rakaia River) Order 1988.

5.

(a) In the event that any water allocated to another water user is not being taken, the consent holder may take that water provided that the consent holder complies with the minimum flow requirements of that consent and water allocation rules in the National Water Conservation Order and provided written approval has been obtained from the existing consent holder, prior to the take being exercised, that allows the consent holder to take its unused allocated water. The consent holder shall provide the Canterbury Regional Council, Attention: Compliance and Enforcement Manager, written agreement with the water permit holders giving permission for the consent holder to take their unused but allocated water.

NOTE: For the purpose of this consent, written agreement may be in the form of an email, fax or signed written document

(b)

(i) Water may also be taken at times when water is not being taken in accordance with one or more of the consents listed in Table 1.

(ii) The rate at which water may be taken shall not exceed the sum of the individual rates of take for the consents listed in Table 1 not being exercised at that time.

(iii) The consent holder shall meet the minimum flow requirements of each consent listed in Table 1, and shall comply with the National Water Conservation Order (Rakaia River) at all times.

(iv) This consent shall not derogate from the rights of water of consent holders listed in Table 1.

Consent	Maximum rate (litres per second)
CRC940052	340
CRC940163	450
CRC990621.2	850
CRC990660	1800
CRC990983.1	2000
CRC940169.1	450
CRC930958B.1	320
CRC990851.1	550
CRC991102.2 and CRC 940486.3	450
CRC941177.5	450
CRC941161.2	450
CRC072619	450
CRC941219	450
CRC952433.2	450

Comment [A13]: Maximum combined rate of abstraction shall not exceed 450l/s

PROVIDED THAT if application CRC062685 has priority to be heard over this application CRC021091 and a consent is granted under application CRC062685 to take water from the Rakaia River, then water can not be taken under the provisions of clause 5(b).

Fish screens

6.

- (a) The consent holder shall install and maintain fish screens or deflection barriers on the intake works.
- (b) The fish screens or deflection barriers shall be installed prior to the abstraction of water authorised by this consent.

7. Objectives

The fish screens or deflection barriers shall be designed to ensure the adverse effects on all fishery components are minimised and no more than minor, using best practice design principles of fish screening. In particular, the fish screen design shall achieve the following performance objectives:

- (a) exclude all adult fish; and
- (b) exclude at least 95% of juveniles of all fishery components that have entered the intake system; and
- (c) all excluded fish shall be returned safely to the main stem of the Rakaia River downstream from the intake; or

- (d) any other objectives established in consultation with Fish and Game North Canterbury and Department of Conservation as outlined in condition 8(a).

For the purpose of this condition “fishery components” shall be defined as all species of sports fish and native fish that are present in the Rakaia River or seasonally migrate past the intake.

8. Fish screen approval process

(a)

- (i) Prior to designing the fish screens the consent holder shall commission a suitably qualified expert/s to assess the fisheries of the river and provide a report that, in the expert’s opinion, confirms the appropriateness of the objectives in condition 7 or provides evidence for the need to amend those objectives.
 - (ii) The report shall identify opportunities where the consent holder may enhance the fisheries of the river in addition to the objectives in condition 7, or in partial or full compensation for any loss of fish that might occur as a result of the water take, or in lieu of the full achievement of the objectives in condition 7.
 - (iii) The consent holder shall consult with Fish and Game North Canterbury and Department of Conservation in preparation of this report;
 - (iv) The consent holder shall submit the report and records of consultation required by condition 8(a)(ii), to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager.
- (b) A person duly authorised by the Canterbury Regional Council shall give written notice to the consent holder stating whether or not it approves of any proposed amendment to the objectives within 20 working days of receipt of the report referred to in condition 8(a), and such approval shall not be unreasonably withheld.
- (c) Prior to the taking of water pursuant to this consent, the consent holder shall install a fish screen (“the Screen”) or deflection barrier across the intake designed in accordance with the certified plans approved by a person duly authorised by the Canterbury Regional Council in accordance with Condition 8(h).
- (d) The Screen or deflection barrier shall achieve the objectives of Condition 7 and for the purposes of this condition this shall be achieved by installing, operating and maintaining the Screen or deflection barrier in accordance with the certified design plans referred to in Condition 8(f).
- (e) The design plans for the Screen or deflection barrier shall be certified by:
- (i) a suitably qualified engineer with experience in the design and operation of fish screens and deflection barriers; and
 - (ii) a fisheries biologist with knowledge of salmonid and native fisheries (“the Certifiers”).
- (f) Prior to the commencement of construction of the fish screen or deflection barrier, the consent holder shall provide to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager:

- (i) the certified design plans including the proposed location of the screen or deflection barrier, screen or deflection barrier slot/aperture size, design sweep velocity, design approach velocity, proposed screen material and an effective by-pass structure and flow which returns fish to an actively flowing braid of the river; and
 - (ii) a report from the Certifiers which certifies the design and operation of the screen or deflection barrier:
 - (A) demonstrates best practice in achievement of Condition 8(d); and
 - (B) takes into consideration regional or national guidelines in relation to fish screen and/or deflection barrier design and/or any international guidelines that the Certifiers consider relevant.
 - (iii) The report required in condition f(ii) shall also specify any monitoring requirements for the fish screen.
- (g) Unless the consent holder has obtained written agreement from the Canterbury Regional Council under condition 8(b), the fish screen shall have, as a minimum requirement, the following provisions:
- (i) the fish screen shall cross the full width of the irrigation canal to prevent fish bypassing the screen into the canal;
 - (ii) the screen material voids shall be a mesh or with maximum width of 4 millimetres;
 - (iii) the screens shall have a design approach velocity perpendicular to the screen surface of no greater than 0.12 metres per second;
 - (iv) the design sweep velocity across the screens shall exceed the approach velocity;
 - (v) an effective bypass system shall be maintained at all times that water is diverted into the scheme, to ensure unrestricted passage is maintained to and from an active braid of the river; and
 - (vi) an effective operation and maintenance schedule.
- (h) A person duly authorised by the Canterbury Regional Council shall give written notice to the consent holder stating whether or not it approves of the certified design plans within 20 working days of receipt of the plans and the certifiers' report referred to in Condition 8(f) and such approval shall not be unreasonably withheld.
- (i) The consent holder shall, prior to commissioning, provide a certificate from a suitably qualified person confirming that construction of the screen or deflection barrier has occurred in accordance with the certified design plans approved in accordance with Condition 8(h).
9. Each fish screen shall be inspected at maximum intervals of two days for any damage causing openings greater than those specified in Condition 8(f)(i), or once every 24 hour period when the flow in the Rakaia River is greater than 300 cubic metres per second, as estimated by Canterbury Regional Council, from measurements at either the gorge recorder site (at or about map reference NZMS 260 K35:015-424) or the recorder site at Fighting Hill (at or about map reference NZMS 260 K35:997-437).
10. In the event that a screen is damaged such that the screen mesh aperture is greater than those specified in Condition 8(f)(i), the screen shall be repaired or replaced as

soon as practicable or the damaged screen shut down, and no water shall be taken. Any screen shut down shall not be opened again until a screen that complied with Condition 8(f)(i) is fitted.

11. The incidence of screen shutdowns shall be recorded and reported to the North Canterbury Fish and Game Council as soon as practicable. Records of screen failure shall be forwarded to Canterbury Regional Council by 31 May each year, or as requested

12. Safety at intake

(a) Prior to the taking of water pursuant to this consent, the consent holder shall design an intake structure that shall, as far as practicable, prevent water users becoming pinned against or washed into the intake on the Rakaia River.

(b) The safety features of the intake structure shall be designed in consultation with the White Water New Zealand and the New Zealand Jet boat Association.

(c) The intention of the safety features will be to achieve, if reasonably practicable, an overall International Grade 2 standard suitable for racing kayaks.

Advice note: for the purpose of this clause, the International Grade 2 standard shall be consistent with the USA Grade 2 definition: "Straightforward rapids with wide, clear channels which are evident without scouting. Occasional manoeuvring may be required, but rocks and medium-sized waves are easily missed by trained paddlers. Swimmers are seldom injured and group assistance, while helpful, is seldom needed."

(d) The design shall incorporate the following:

(i) provide and maintain, if practicable, a wide entrance to a diversion channel,

(ii) provide and maintain a widened forebay upstream from the intake gate, to lower the water velocity in the intake channel to about 0.5 cubic metre per second in median to low flow conditions when the full intake flow is operating,

(iii) trial a diagonal floating boom across the diversion channel upstream from the intake gate, and adopt this permanently if it proves successful in the opinion of a relevant officer of the Canterbury Regional Council,

(iv) provide and maintain an inclined trash rack on the upstream face of the intake gate, leading to a safety ledge and exit point: the size of the trash rack shall be such that velocities approaching it do not exceed 1 cubic metre per second,

(v) the surfaces presented to the water shall be free from sharp protrusions which could injure a person or snag clothing.

(e) The design plans for the intake shall be certified by:

(i) a suitably qualified person with experience in the design and operation of intake structures, and

(ii) a person with experience in water safety, particularly for recreational boating and kayaking on rivers.

(f) Prior to the commencement of construction of the intake structure, the consent holder shall provide to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager:

- (i) The certified design plans;
 - (ii) A report from the certifiers which certifies the design and operation of the safety features on the intake structures which demonstrates best practice in achievement of Condition 12(a) to 12(d);
- (g) A person duly authorised by the Canterbury Regional Council shall give written notice to the consent holder stating whether or not it approves of the certified design plans within 20 working days of receipt of the plans and the certifiers report referred to in Condition 12(f)(ii) and such approval shall not be unreasonably withheld.
- (h) The consent holder shall, prior to commissioning, provide a certificate from a suitably qualified person confirming that construction of the intake structure has occurred in accordance with the certified design plans approved in accordance with Condition 12(g).
- (i) The consent holder shall install, operate and maintain an intake structure designed in accordance with the certified plans approved by a person duly authorised by the Canterbury Regional Council in accordance with Condition 12(g).
- (j) Prior to the first exercise of this consent, the consent holder shall erect and maintain two signs warning of the intake structure at two locations upstream from the intake. The signs shall be visible on the banks and by in-river users and the location, size and wording shall be developed in consultation with White Water New Zealand and to the approval of the Canterbury Regional Council.
- (k) The consent holder shall, as far as is practicable, inform all commercial users and recreational boat clubs of the position of the intake, within one month of the start of construction. A copy of the written notice and a list of those parties notified shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager at least 20 working days prior to the construction on the intake.
- (l) Within six months of commencement of operation the consent holder shall conduct live tests of the intake under a range of river flow conditions and intake flows, and
- (i) shall invite Whitewater NZ and the New Zealand Jet Boat Association to observe and participate in those tests, and
 - (ii) shall invite Whitewater NZ and the New Zealand Jet Boat Association to comment on potential modifications to design and operation, and
- (m) Within 20 working days upon the completion of the live trials, the consent holder shall report to Canterbury Regional Council on the tests required in condition 12(l), including the modifications to design and operation of the intake. In particular, the report shall include:
- (i) comments made by Whitewater New Zealand and the New Zealand Jet Boat Association; and
 - (ii) a report from the certifiers (as set out in condition 12(e)) which includes the following:

- A comments on the effectiveness of the trial floating boom required in condition 12(d)(iii) to aid in preventing water users becoming pinned against and/or washed into the intake; and
- B certification that the modifications to the intake safety features will increase the effectiveness of the safety features to prevent water users being pinned against or washed into the intake structure.

(n)

- (i) Within 40 working days, the consent holder shall adopt the modifications to the intake design as identified in the report required in condition 12(m).
- (ii) In the event that the report required under condition 12(m)(ii) indicates that the floating boom is an effective mechanism to aid in preventing water users becoming pinned against and/or washed into the intake, then the floating boom shall form a permanent part of the safety features of the intake structure.

13. The intake screen and trash rack shall be cleaned and maintained on a regular basis such that the performance objective and design requirements to which conditions 12(d) refer are achieved on a continual basis.

14. Measurement of water take.

The consent holder shall, prior to the commencement of this consent:

- (a) install a water measuring device in a location that will enable the determination of the continuous rate of flow and volume of water being diverted to within an accuracy of 10 percent.
 - (i) The water measuring device shall, as far as is practicable, be installed at a site likely to retain a stable relationship between flow and water level. The measuring device shall be installed in accordance with the manufacturer's instructions.
- (b) install a tamper-proof electronic recording device such as a data logger(s), which is telemetered, as specified in clause (c).
- (c) The recording device(s) shall be connected to a telemetry system which collects and stores all of the data continuously with an independent network provider who will make that data available in a commonly used format at all times to the Canterbury Regional Council and the consent holder.
- (d) The water measuring and recording devices described in clauses (a) and (b) shall be available for inspection at all times by the Canterbury Regional Council, including access to the data recorded in accordance with clause (c).
- (e) All data from the recording device described in clause (b), and the corresponding relationship between the water measuring device (a(i)), shall be provided to the Canterbury Regional Council annually in the month of June.

15. Within six months of the installation of the water measuring or recording device(s), specified in condition 14, or any subsequent replacement water measuring or recording device(s), or at any time when requested by the Canterbury Regional

Council, the consent holder shall provide an installation and commissioning form demonstrating by means of a clear diagram, that:

- (c) the water measuring and recording device(s) is installed in accordance with the manufacturers specifications; and
 - (d) data from the recording device(s) can be readily accessed and/or retrieved in accordance with clauses (ii) and (iii) of condition 14(d) above.
16. This consent is subject to the conditions listed in Schedule 2: Administrative Conditions.
17. If the consent holder takes water under condition 5(b), then prior to the abstraction of that water, the consent holder shall ensure that the abstraction authorised by the associated consent listed in Table 1 is connected to a telemetry system which determines whether or not water is being taken ("on/off telemetry").
- (a) The telemetry system shall collect and store all of the data continuously with an independent network provider who will make that data available in a commonly used format at all times to the Canterbury Regional Council and the consent holder
 - (a) By 31 July each year, the consent holder shall submit a report outlining compliance with conditions 5(b) of this consent for the previous 12 months, to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager.

Discharge Permits

CRC102332 Discharge contaminants and water during construction

This application is an amalgamation of applications CRC061871, CRC061873 and CRC061920 and covers construction phase discharges. Duration 15 years.

Limits

1. The discharge shall be only sediment laden water associated with the construction of the Inlet Canal, Headrace Canal and Water Distribution Network, located within the Scheme Area as shown on Plan CRC102332 which forms part of this consent.
2. Where practicable all discharges of sediment laden water shall be directed onto vegetated land.
3. Where it is not practicable to discharge sediment laden water onto land the discharge into surface water shall be only into the following water bodies:
 - (a) surface water bodies listed in schedules B.1 and B.2;
 - (b) the rakaia river; and
 - (c) the waimakariri river.

4. This consent is subject to the general conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions which form part of this consent.

Pre-construction

5. The consent holder shall ensure that all personnel working on the site are made aware of and have access to the contents of this consent document and all associated erosion and sediment control plans and methodology.
6. The consent holder shall inform the Canterbury Regional Council in writing, Attention: RMA Compliance and Enforcement Manager, at least ten days prior to the commencement of work on each new stage of development.
7. Prior to commencement of works the consent holder or its agent shall arrange and conduct a pre-construction site meeting between the Canterbury Regional Council and all relevant parties, including the primary contractor. At a minimum, the following shall be covered at the meeting:
 - (a) scheduling and staging of the works;
 - (b) responsibilities of all relevant parties;
 - (c) contact details for all relevant parties;
 - (d) expectations regarding communication between all relevant parties;
 - (e) procedures for implementing any amendments;
 - (f) site inspection; and
 - (g) confirmation that all relevant parties have copies of the contents of this consent document and all associated erosion and sediment control plans and methodology.

Erosion and Sediment Control Plans (ESCP)

8. The consent holder shall prepare an Erosion and Sediment Control Plan (ESCP) which shall outline the measures which will be taken to ensure compliance with Condition (20). This ESCP shall include but not be limited to:
 - (a) a map showing the location of all works;
 - (b) details of any work staging;
 - (c) an outline of the erosion and sediment control measures to be used including measures to treat water using chemicals;
 - (d) detailed plans showing the location of sediment control measures, onsite catchment boundaries, and sources of runoff for each work stage or sub-stage;
 - (e) a programme of works, which includes but is not limited to, a proposed timeframe for the works;
 - (f) a programme for the inspection and maintenance of the sediment control measures.
9. The ESCP shall be prepared in accordance with the Canterbury Regional Council, 2007 "Erosion and Sediment Control Guidelines for the Canterbury Region" Report No. CRC R06/23.

Certification

10. The ESCP and any amendments to the ESCP shall be certified by a suitably qualified and experienced engineer as being:
 - (a) adequate to achieve the performance standards outlined in Condition (20); and
 - (b) consistent with the conditions of this consent;prior to any discharge authorised by this consent occurring.
11.
 - (a) The ESCP, with the exception of the detailed plans required under condition (8)(d), along with any certification required under Condition (10), shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, at least one month prior to construction commencing.
 - (b) The plans for each stage required under condition (8)(d) shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, at least ten working days prior to work on that stage commencing
12. The ESCP may be amended at any time. Any amendments shall be:
 - (a)
 - (i) for the purpose of improving the efficacy of the erosion and sediment control measures; or
 - (ii) for the purpose of adding details of a future work stage;and
 - (b) consistent with the conditions of this resource consent; and
 - (c) submitted in writing to the canterbury regional council, attention: rma compliance and enforcement manager, prior to any amendment being implemented.

General

13. During construction, all practicable measures shall be undertaken to minimise discharges of sediment-laden runoff off site.
14. No cut vegetation, debris, or any other excavated material, shall be placed in a position such that it may move into a surface water body.
15. All exposed surfaces within 100 metres of a surface waterway shall be stabilised once earthworks are complete. or if the exposed area is not to be earthworked for a period of 14 days or more. Stabilised: means an area inherently resistant to erosion such as rock (excluding sedimentary rocks), or rendered resistant to erosion by the application of aggregate, geotextile, vegetation or mulch. Where vegetation is to be used on a surface that is not otherwise resistant to erosion, the surface is considered stabilised once 80 percent vegetation cover has been established.
16. Erosion and sediment control measures implemented under the ESCP shall be constructed and maintained in accordance with the Canterbury Regional Council, "Erosion and Sediment Control Guidelines for the Canterbury Region" Report No. CRCR06/23, February 2007 (ESCG).
17. If the consent holder abandons work on-site, it shall first take adequate preventative and remedial measures to control sediment discharges, and shall thereafter maintain

those measures for so long as necessary to prevent sediment discharges from the site.

Water Treatment Using Chemicals

18. Prior to the commissioning of chemical treatment, the consent holder shall provide the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager with a Chemical Treatment Plan (CTP). The CTP shall include, but not be limited, the following information:
 - (a) specific design details of the flocculation system;
 - (b) monitoring, maintenance (including post-storm) and contingency programme (including a record sheet);
 - (c) details of optimum dosage (including assumptions);
 - (d) results of the initial flocculation trial;
 - (e) a spill contingency plan;
 - (f) details of the person or bodies who will hold responsibility for long-term maintenance of the flocculation treatment system and the organisational structure which will support this structure. Any amendments to the CTP shall be provided to the Manager, in writing, prior to implementation.
19. Water treatment chemicals shall be applied in accordance with product specifications and the methods described in the Auckland Regional Council, Technical Publication #227 Flocculation Guideline.

Performance Standard

20. The discharge associated with this consent shall not be the cause a conspicuous increase in turbidity or a decrease in clarity in the receiving water body following reasonable mixing. For the purpose of this consent, reasonable mixing is confined to a mixing-zone that:
 - (a) is no longer than 10 times the wetted channel width; and
 - (b) is no longer than 100 metres along the longest axis of the zone; and
 - (c) does not occupy greater than one third of the wetted channel width.

Note: the wetted channel width is the width of water in the braid receiving the discharge.

Monitoring

21. The consent holder shall ensure that all erosion and sediment control measures are inspected each working day while any earth remains disturbed or otherwise unstabilised.
22. If any storm event results in water discharging from the sediment pond(s) or decanting earth bund(s) into any surface water body, with the exception of the Waimakariri River and the Rakaia River, the consent holder shall, within four hours, undertake water turbidity or water clarity measurements upstream and downstream of the zone of non-compliance to determine whether there has been a conspicuous increase in turbidity or a conspicuous decrease in clarity.
 - (a)

- (i) Water turbidity shall be measured using a calibrated turbidity meter.
 - (ii) Water clarity shall be measured using a clarity tube or equivalent method.
- (b) Water turbidity or water clarity measurements shall be undertaken by a suitably qualified person.
- (c)
- (i) A conspicuous increase shall be defined as an increase in turbidity of twenty percent or higher at the downstream monitoring site; or
 - (ii) a conspicuous decrease shall be defined as a decrease in clarity of twenty percent or higher at the downstream monitoring site.
23. In the event that there is a conspicuous increase in water turbidity or decrease in clarity measured in accordance with Condition (22) the applicant shall:
- (a) identify the cause of the elevated suspended sediment concentrations; and
 - (b) identify and undertake mitigation and actions to prevent further exceedances.
24. Written records of all inspections and visual monitoring shall be kept, along with copies of all photographs taken. All records and photographs shall be provided to the Canterbury Regional Council upon request.

Spills

25. There shall be no refuelling within 50 metres of any surface water body.
26. The consent holder shall take all practicable measures to avoid spills of fuel or any other hazardous substance within the site.
- (a) In the event of a spill of fuel or any other hazardous substance, the consent holder shall clean up the spill as soon as practicable, inspect and clean the stormwater system and take measures to prevent a recurrence.
 - (b) The consent holder shall inform the Canterbury Regional Council within 24 hours of a spill event, and shall provide the following information:
 - (i) the date, time, location and estimated volume of the spill;
 - (ii) the cause of the spill;
 - (iii) the type of hazardous substance(s) spilled;
 - (iv) clean up procedures undertaken;
 - (v) details of the steps taken to control and remediate the effects of the spill on the receiving environment;
 - (vi) an assessment of any potential effects of the spill; and
 - (vii) measures to be undertaken to prevent a recurrence.

Decommissioning

27. Erosion and sediment control measures shall not be decommissioned until the site is stabilised.

28. Decommissioning shall be only undertaken when dry weather is forecast for a period suitable to allow decommissioning to be carried out without rainfall occurring.

CRC102333 Discharge contaminants and water during scheme operation and maintenance

This application is an amalgamation of applications CRC061871, CRC061873 and CRC061920 and covers operation and maintenance phase discharges. Duration 35 years.

Limits

1. The discharge shall be only sediment laden water associated with the operation and maintenance of the Inlet Canal, Headrace Canal and Water Distribution Network, located within the Scheme Area as shown on Plan CRC102333 which forms part of this consent.
2. Where practicable all discharges of sediment laden water shall be directed onto vegetated land.
3. Where it is not practicable to discharge sediment laden water onto land the discharge into surface water shall be only into the following water bodies:
 - (a) surface water bodies listed in Schedules B.1 and B.2;
 - (b) the Rakaia River; and
 - (c) the Waimakariri River.
4. This consent is subject to the general conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions.

Pre-construction

5. The consent holder shall ensure that all personnel working on the site are made aware of and have access to the contents of this consent document and all associated erosion and sediment control plans and methodology.
6. The consent holder shall inform the Canterbury Regional Council in writing, Attention: RMA Compliance and Enforcement Manager, at least ten days prior to the commencement of work on each new stage of development.
7. Prior to commencement of works the consent holder or its agent shall arrange and conduct a pre-construction site meeting between the Canterbury Regional Council and all relevant parties, including the primary contractor. At a minimum, the following shall be covered at the meeting:
 - (a) scheduling and staging of the works;
 - (b) responsibilities of all relevant parties;
 - (c) contact details for all relevant parties;

- (d) expectations regarding communication between all relevant parties;
- (e) procedures for implementing any amendments;
- (f) site inspection; and
- (g) confirmation that all relevant parties have copies of the contents of this consent document and all associated erosion and sediment control plans and methodology.

Erosion and Sediment Control Plans

8. Prior to each maintenance operation the consent holder shall prepare an Erosion and Sediment Control Plan (ESCP) which shall outline the measures which will be taken to ensure compliance with Condition (20). This ESCP shall include but not be limited to:
 - (a) a map showing the location of all works;
 - (b) details of any work staging;
 - (c) an outline of the erosion and sediment control measures to be used;
 - (d) detailed plans showing the location of sediment control measures, onsite catchment boundaries, and sources of runoff for each work stage or sub-stage;
 - (e) a programme of works, which includes but is not limited to, a proposed timeframe for the works;
 - (f) a programme for the inspection and maintenance of the sediment control measures.
9. The ESCP shall be prepared in accordance with the Canterbury Regional Council, 2007 "Erosion and Sediment Control Guidelines for the Canterbury Region" Report No. CRC R06/23.

Certification

10. The ESCP and any amendments to the ESCP shall be certified by a suitably qualified and experienced engineer as being:
 - (a) adequate to achieve the performance standards outlined in Condition (20); and
 - (b) consistent with the conditions of this consent;prior to any discharge authorised by this consent occurring.
11.
 - (a) The ESCP, with the exception of the detailed plans required under Condition (8)(d), along with any certification required under Condition (12), shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, at least one month prior to works commencing.
 - (b) The plans for each stage required under condition (8)(d) shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, at least ten working days prior to work on that stage commencing

12. The ESCP may be amended at any time. Any amendments shall be:

- (a)
 - (i) for the purpose of improving the efficacy of the erosion and sediment control measures; or
 - (ii) for the purpose of adding details of a future work stage;
- and
- (b) consistent with the conditions of this resource consent; and
- (c) submitted in writing to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, prior to any amendment being implemented.

General

- 13. During operation and maintenance, all practicable measures shall be undertaken to minimise discharges of sediment-laden runoff off site.
- 14. No cut vegetation, debris, or any other excavated material, shall be placed in a position such that it may move into a surface water body.
- 15. All exposed surfaces within 100 metres of a surface waterway shall be stabilised once earthworks are complete or if the exposed area is not to be earthworked for a period of fourteen days or more. Stabilised: means an area inherently resistant to erosion such as rock (excluding sedimentary rocks), or rendered resistant to erosion by the application of aggregate, geotextile, vegetation or mulch. Where vegetation is to be used on a surface that is not otherwise resistant to erosion, the surface is considered stabilised once 80 percent vegetation cover has been established.
- 16. Erosion and sediment control measures implemented under the ESCP shall be constructed and maintained in accordance with the Canterbury Regional Council, "Erosion and Sediment Control Guidelines for the Canterbury Region" Report No. CRCR06/23, February 2007 (ESCG).
- 17. If the consent holder abandons work on-site, it shall first take adequate preventative and remedial measures to control sediment discharges, and shall thereafter maintain those measures for so long as necessary to prevent sediment discharges from the site.

Water Treatment using Chemicals

- 18. Prior to use of chemical treatment, the consent holder shall provide the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager with a Chemical Treatment Plan (CTP). The CTP shall include, but not be limited, the following information:
 - (a) specific design details of the flocculation system;
 - (b) monitoring, maintenance (including post-storm) and contingency programme (including a Record Sheet);
 - (c) details of optimum dosage (including assumptions);
 - (d) results of the initial flocculation trial;

- (e) a spill contingency plan;
 - (f) details of the person or bodies who will hold responsibility for long-term maintenance of the flocculation treatment system and the organisational structure which will support this structure. Any amendments to the CTP shall be provided to the Manager, in writing, prior to implementation.
19. Water treatment chemicals shall be applied in accordance with product specifications and the methods described in the Auckland Regional Council, Technical Publication #227 Flocculation Guideline.

Performance Standard

20. The discharge associated with this consent shall not cause a conspicuous increase in turbidity or a decrease in clarity in the receiving surface water body following reasonable mixing. For the purpose of this consent, reasonable mixing is confined to a mixing-zone that:
- (a) is no longer than 10 times the wetted channel width; and
 - (b) is no longer than 100 metres along the longest axis of the zone; and
 - (c) does not occupy greater than one third of the wetted channel width.

Note: the wetted channel width is the width of water in the braid receiving the discharge.

Monitoring

21. The consent holder shall ensure that all erosion and sediment control measures are inspected each working day while any earth remains disturbed or otherwise unstabilised.
22. If any storm event results in water discharging from the sediment pond(s) or decanting earth bund(s) into any surface water body, with the exception of the Waimakariri River and the Rakaia River,, the consent holder shall, within four hours, undertake water turbidity or water clarity measurements upstream and downstream of the zone of non-compliance to determine whether there has been a conspicuous increase in turbidity, or a conspicuous decrease in clarity.
- (a)
 - (i) Water turbidity shall be measured using a calibrated turbidity meter.
 - (ii) Water clarity shall be measured using a clarity tube or equivalent method.
 - (b) Water turbidity or water clarity measurements shall be undertaken by a suitably qualified person.
 - (c)
 - (i) A conspicuous increase shall be defined as an increase in turbidity of twenty percent or higher at the downstream monitoring site; or
 - (ii) a conspicuous decrease shall be defined as a decrease in clarity of twenty percent or higher at the downstream monitoring site.
 - (d) A conspicuous increase shall be defined as an increase in turbidity of twenty percent or higher at the downstream monitoring site.

23. In the event that there is a conspicuous increase in water turbidity or decrease in water clarity measured in accordance with Condition (22) the applicant shall:
- (a) identify the cause of the elevated suspended sediment concentrations; and
 - (b) identify and undertake mitigation and actions to prevent further exceedances.
24. Written records of all inspections and visual monitoring shall be kept, along with copies of all photographs taken. All records and photographs shall be provided to the Canterbury Regional Council upon request.

Spills

25. There shall be no refuelling within 50 metres of any surface water body.
26. The consent holder shall take all practicable measures to avoid spills of fuel or any other hazardous substance within the site.
- (a) In the event of a spill of fuel or any other hazardous substance, the consent holder shall clean up the spill as soon as practicable, inspect and clean the stormwater system and take measures to prevent a recurrence.
 - (b) The consent holder shall inform the Canterbury Regional Council within 24 hours of a spill event, and shall provide the following information:
 - (i) the date, time, location and estimated volume of the spill;
 - (ii) the cause of the spill;
 - (iii) the type of hazardous substance(s) spilled;
 - (iv) clean up procedures undertaken;
 - (v) details of the steps taken to control and remediate the effects of the spill on the receiving environment;
 - (vi) an assessment of any potential effects of the spill; and
 - (vii) measures to be undertaken to prevent a recurrence.

Decommissioning

27. Erosion and sediment control measures shall not be decommissioned until the site is stabilised.
28. Decommissioning shall be only undertaken when dry weather is forecast for a period suitable to allow decommissioning to be carried out without rainfall occurring.

CRC102334 Discharge stormwater which may contain contaminants onto or into land and into water

This application is an amalgamation of CRC061922, CRC061945, CRC061924 and CRC061983. Duration 35 years.

Limits

- (1) The discharge shall be only stormwater from all structures and impervious areas associated with the Central Plains Water Enhancement Scheme (the scheme), including but not limited to:
 - (a) temporary and permanent access tracks;
 - (b) the roofs of temporary and permanent buildings;
 - (c) fuel storage areas; and
 - (d) permanent and temporary hardstand areas.

located within the Scheme Area as shown on Plan CRC102334.

- (2) The discharge shall be either:
 - (a) onto or into land; or
 - (b) into surface water
- (3) All fuel shall be stored within on a sealed surface a sealed bund with a capacity of at least 110 percent of the volume of fuel stored.

Stormwater system

- (4) All stormwater shall be treated as follows:
 - (a) Stormwater from access tracks, permanent hardstand areas, temporary buildings, and temporary hardstand areas shall be either:
 - (i) discharged across vegetated land; or
 - (ii) discharged via a vegetated infiltration basin; or
 - (iii) treated in a vegetated swale prior to discharge; or
 - (iv) treated in a detention basin prior to discharge.
 - (b) Roof stormwater from permanent buildings shall either:
 - (i) discharge into land via soak pits via a sealed system that excludes all other stormwater; or
 - (ii) discharge via any of the treatment measures listed in condition (4)(a).
 - (c) Stormwater collected from within fuel storage bunds shall be trucked from the site and disposed of at a facility authorised to receive such materials.

Design criteria

- (5) Each soak pit shall:

- (a) be sized to dispose of all stormwater generated by the contributing catchment by a 10 percent Annual Exceedance Probability rainfall event of one hour duration;
 - (b) have at least one metre separation between the base and the highest seasonal groundwater level at the soak pit location; and
 - (c) have the base sunk into free-draining gravels.
- (6)
- (a) Any land which receives a discharge of stormwater shall be uniformly vegetated with grass or groundcover vegetation.
 - (b) Stormwater from permanent hardstand areas or access tracks that discharges onto vegetated land shall discharge over at least 30 metres of vegetated land before discharging into a surface water body.
- (7) All infiltration basins shall:
- (a) be designed and constructed to have sufficient capacity to contain and infiltrate stormwater runoff from the contributing catchment from all events up to and including a 20 percent annual exceedance probability (20% aep) event of any duration;
 - (b) be lined with a layer of sandy loam at least 150 millimetres thick;
 - (c) be uniformly vegetated with grass; and
 - (d) have at least one metre separation distance between the base and the highest seasonal groundwater level at the site.
- (8) All swales shall:
- (a) have a hydraulic residence time of at least nine minutes for the water quality volume from the contributing catchment;
 - (b) have a longitudinal slope no flatter than 1:100;
 - (c) have a maximum bottom width of between 0.5 and two metres;
 - (d) have side batters no steeper than one vertical to three horizontal;
 - (e) be uniformly vegetated with grass.
- (9) All detention basins shall:
- (a) have the capacity to contain stormwater runoff from the contributing catchment from all events up to and including a 20 percent Annual Exceedance Probability (20% AEP) event of any duration for at least an average of 24 hours; and

- (b) have the inlet located as far as possible from the outlet.
- (10) Stormwater shall not pond in any component of the stormwater system for longer than three days after the cessation of any storm event.
- (11) The discharge shall not cause scour, erosion and/or instability to the bed or banks of any surface waterway.
- (12) Within 20 working days of the installation of any infiltration basin, a certificate signed by a Chartered Professional Engineer (CPEng) with stormwater system construction experience shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, to certify that the stormwater system complies with Conditions (4) to (9) of this consent. This CPEng shall also sign a statement confirming that they are competent to certify the engineering work

Inspections and Maintenance

- (13) An inspection of the stormwater system shall be carried out at least once every six months.
 - (a) Any visible hydrocarbons, and debris or litter shall be removed within ten working days of the inspection.
 - (b) Any accumulated sediment in the stormwater system shall be removed within ten working days of the inspection.
 - (c) Any scour or erosion shall be repaired within ten working days of the inspection.
 - (d) Any blockage of inlets and/or outlets shall be removed immediately.
- (14) The infiltration basins, swales, and any vegetated land that receives stormwater discharge shall be:
 - (a) Maintained so that vegetation or grass is in a healthy and uniform state. Seasonal brown-off is permitted.
 - (b) Replanted where erosion or die-off has resulted in bare or patchy soil cover.
- (15) The vegetation in the swales shall be maintained at a height of between 100 and 150 millimetres.
- (16) A management plan detailing the design, operation and maintenance of the stormwater system shall be developed for the site or stage of works within the scheme to which the stormwater system relates. The management plan shall be submitted to Canterbury Regional Council prior to the use of the system and a copy shall also be held by the consent holder, along with a copy of this consent.

The management plan shall detail how compliance with conditions (13) to (15) will be achieved.

Performance Standards

- (17) The consent holder shall ensure that the discharges to surface water do not, at any time, result in:
- (a) The production of oil or grease films;
 - (b) The production of floatable or suspended materials; or
 - (c) A significant increase in the turbidity following reasonable mixing. A significant increase shall be defined as an increase greater than 20 percent as measured using a calibrated turbidity meter. For the purpose of this consent, reasonable mixing is confined to a mixing-zone that:
 - (i) is no longer than 10 times the wetted channel width; and
 - (ii) is no longer than 100 metres along the longest axis of the zone; and
 - (iii) does not occupy greater than one third of the wetted channel width.

Note: the wetted channel width is the width of water in the braid receiving the discharge.

Spills

- (18) The consent holder shall take all practicable measures to avoid spills of fuel or any other hazardous substances within the site.
- (a) In the event of a spill of fuel or any other hazardous substances, the consent holder shall clean up the spill as soon as practicable, inspect and clean the stormwater system and take measures to prevent a recurrence;
 - (b) The consent holder shall inform the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within 24 hours of a spill event and shall provide the following information:
 - (i) The date, time, location and estimated volume of the spill;
 - (ii) The cause of the spill;
 - (iii) The type of hazardous substance(s) spilled;
 - (iv) Clean up procedures undertaken;
 - (v) Details of the steps taken to control and remediate the effects of the spill on the receiving environment;
 - (vi) An assessment of any potential effects of the spill; and

- (vii) Measures to be undertaken to prevent a recurrence.

CRC061928 Discharge water for dewatering purposes during construction

To discharge water taken for dewatering purposes during construction or maintenance works to land in circumstances where it may enter water, and to water in the surface waterbodies identified in Schedules B.1 and B.2 and the sites identified in Schedules A.3 and A.4. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The discharge of dewatering water shall only be water taken under resource consent CRC061925.
2. The discharge of dewatering water shall be undertaken in accordance with the conditions in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions, attached to this consent.
3. The water taken for dewatering purposes during construction or maintenance works shall only be discharged onto land in circumstances where it may enter water, and/or to water in the surface waterbodies identified in Schedules B.1 and B.2.
4.
 - (a) The discharge of dewatering water shall not cause any adverse effects to surrounding property or infrastructure. For the purpose of this condition, adverse effects shall include but not be limited to:
 - (i) erosion and scour;
 - (ii) ponding and flooding; and
 - (iii) groundwater mounding.
 - (b) In the event that the discharge adversely affects surrounding property or infrastructure, the consent holder shall immediately mitigate or remedy the situation.
5. The consent holder shall submit to the Canterbury Regional Council RMA Compliance and Enforcement Manager at least one month prior to the exercise of this consent, a Dewatering Management Plan outlining the construction and management practices and procedures to be adopted in order to comply with the conditions of this consent and ensure that the effects of the dewatering activities are minimised to the greatest extent practicable. The plan shall include, but not limited to:
 - (a) The extent of the construction activities in relation to the areas where dewatering will be required.
 - (b) The types of dewatering methods to be adopted and details of where water will be directed to and disposed of.
 - (c) A construction management programme including timetable, sequence of events and duration.

- (d) The mitigation measures to be adopted if required to minimise the effects of dewatering on surrounding property and infrastructure.
 - (e) Contact details for the person in charge of the site works.
6. The consent holder shall not commence discharge of dewatering water unless they have obtained written notice from a person duly authorised by the Canterbury Regional Council, stating that the Dewatering Management Plan meets the requirements set out in condition 5.
 7. The consent holder may at any time, submit to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, an amended Dewatering Management Plan for the purposes of:
 - (a) improving the efficiency and/or quality of the discharge; or
 - (b) to avoid, remedy or mitigate an adverse environmental effect.

CRC061949 Discharge water and contaminants as seepage from canals and distribution races to land where it may enter water

To discharge water and contaminants to land in circumstances where it may enter water, in the form of seepage from the length of the Inlet Canal, Headrace Canal, Water Distribution Network, and wetlands, as listed in Schedules A1 to A.4 and C3-C4. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The consent holder may discharge water and contaminants to land in circumstances where it may enter water, in the form of seepage from the length of the Inlet Canal, Headrace Canal, Water Distribution Network, Intake and Headworks, as listed in Schedules A1 to A.4 and C3 to C4.
2. The consent shall be undertaken in accordance with the conditions in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions, attached to this consent.
3. The combined leakage and discharge from the Inlet Canal, Headrace Canal and Water Distribution Network and the discharge to wetlands and surface water bodies as consented under CRC102335, shall not exceed 20 percent of the water taken for irrigation under resource consents CRC021091 and CRC061972 . .
4.
 - (a) The Inlet Canal, Headrace Canal and Water Distribution Network shall be designed and constructed to comply with condition 3.
 - (b) At least one month prior to the construction of each discharge site on the Inlet Canal, Headrace Canal and Water Distribution Network, the consent holder shall submit to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, final design plans for the Inlet Canal, Headrace Canal and Water Distribution Network.

- (c) The final design plans shall be reviewed and signed by a chartered professional engineer, certifying that all plans comply with condition 3.
 - (d) The review and certification of the plans shall not be undertaken by the person responsible for preparing the design plans.
5. The structures shall be constructed in accordance with the reviewed and certified design plans.
 6. A certificate signed by a chartered professional engineer certifying that the Inlet Canal, Headrace Canal and Water Distribution Network have been constructed in accordance with the certified design plans, shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, within 20 working days of completion of the construction of each structure.

CRC102335 Discharge surplus water and contaminants from canals and distribution network to water and to land

This application is an amalgamation of CRC061950, CRC071916, CRC071917, CRC061977 and CRC061978.

To discharge surplus water and contaminants, from the Headrace and Water Distribution Network to land in circumstances where it may enter groundwater, and to water at the locations listed in Schedules B.1, B.2, C.1, C.2, C.3 and C.4. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The discharge shall only be surplus water which may contain contaminants from the Headrace and Water Distribution Network.
2. The discharge shall only be:
 - (a) into water at the locations listed in Table 1 of condition 6; or
 - (b) into land at the locations listed in Table 2 of condition 11 and at the locations listed in Schedules B.1, B.2, C.1, C.2.
3. This consent is subject to the conditions listed in Schedule 1; General Conditions and Schedule 2: Administrative Conditions, which forms part of this consent.
4. The combined discharge of water under this consent and the leakage of water from the Inlet Canal, Headrace Canal and Water Distribution Network as consented under CRC061949, shall not exceed 20 percent of the water taken for irrigation under resource consents CRC021091 and CRC061972.
5. The consent holder shall ensure that at all times the discharge does not prevent the Canterbury Regional Council and its contractors and agents from accessing the Waimakariri riverbed for the purpose of operation and maintenance of the Waimakariri River Flood Protection Scheme.

Discharges into water

6. The rate of flow at any discharge point shall not exceed that shown in the following table.

Location	Site map reference	Maximum operational flow (m ³ /s)	Emergency peak flow (m ³ /s)
Waimakariri	NZMS260 L35:477-496	n/a	9.0
Waimakariri	NZMS260 M35:523-490	0.4	1.0
Waimakariri	NZMS260 M35:539-488	0.4	3.0
Rakaia	NZMS260 L36:329-184	1.5	16.5
Rakaia	NZMS260 L36:264-219	n/a	5.5
Table 1 – discharges to water			

For the purposes of this consent, emergency peak flow is the maximum rate at which bywash water is discharged in an emergency situation, such as a power failure.

7. The discharge shall not result in erosion of the bed or banks of any watercourse.
8. The discharges into the Waimakariri River authorised by this consent shall not result in any of the following:
 - (a) production of conspicuous oil or grease films, scums or foams, or floatable or suspended materials.
 - (b) conspicuous change in the colour or decrease in visual clarity. A conspicuous change in colour shall be defined as a change greater than 10 points on the Munsell scale. A conspicuous decrease in visual clarity shall be defined as a change greater than 33 percent, as measured by black disc or clarity tube.
 - (c) emission of objectionable odour.
 - (d) an increase in maximum cover of stream or river beds by periphyton as filamentous growths or mats greater than 3 millimetres thick, to greater than 25 percent cover.
 - (e) Visible plumose growth or mats of bacterial or fungal slime growths (also known as heterotrophic growths or sewage fungus).
 - (f) an exceedence of 2 grams per cubic metre of BOD₅ of GF/C filtered water.
 - (g) The concentration of dissolved oxygen falling below 80 percent of saturation concentration.
 - (h) Fish and other aquatic organisms shall not be rendered unsuitable for human consumption.
 - (i) a statistically measurable impairment of the reproductive ability of fish or of the food of fish. There shall be no toxic effect on fish or on the food of fish. For the purpose of this standard, fish, and the food of fish, do not include any organisms specified as a pest in a pest management strategy under the Biosecurity Act 1993.

- (j) An increase in the natural temperature of the water by more than 3 degrees celsius, and the temperature of the water, as a result of the exercise of this consent, shall not adversely affect the spawning of trout or salmon during the spawning season.
 - (k) The median faecal coliform concentration of not less than five samples taken within any consecutive 30 day period, shall not exceed 200 faecal coliforms per 100 millilitres; furthermore, no more than 20% of samples within any consecutive 30 day period shall exceed 800 faecal coliforms per 100 millilitres.
 - (l) The quality of the water shall not be altered in those characteristics which have a direct bearing upon the objectionable nature to Tangata Whenua of contamination of surface waters by treated or untreated human sewage.
 - (m) The water shall not be rendered unsuitable for consumption by farm animals.
9. The discharges into the Rakaia River shall comply with the following standards:
- (a) The discharge shall be substantially free from suspended solids;
 - (b) After allowing for reasonable mixing of the discharge with the receiving water:
 - (i) the natural water temperature shall not be changed by more than three degrees Celsius
 - (ii) The waters shall not be tainted so as to make them unpalatable, nor contain toxic substances to the extent that they are unsafe for consumptions by humans or by farm animals, nor shall they emit objectionable odours;
 - (iii) There shall be no destruction of natural aquatic life by reason of a concentration of toxic substances;
 - (iv) The natural colour and clarity of the water shall not be changed to a conspicuous extent;
 - (v) The oxygen content in solution in the water shall not be reduced below 6 milligrams per litre

For the purpose of this consent, reasonable mixing is confined to a mixing-zone that:

- (A) is no longer than 10 times the wetted channel width; and
- (B) is no longer than 100 metres along the longest axis of the zone; and
- (C) does not occupy greater than one third of the wetted channel width.

Note: the wetted channel width is the width of water in the braid receiving the discharge.

10. All practicable measures shall be undertaken to ensure that the discharged water is not deflected into the berm.

Discharges into land

11. The rate of flow at any discharge point shall not exceed that shown in the following table.

Location	Site map reference	Maximum operational	Emergency peak flow

		flow (m ³ /s)	(m ³ /s)
Hawkins	NZMS260 L36:394-330	0.4	3.0
Hawkins	NZMS260 L35:281-574	0.3	2.5
Waianiwaniwa	NZMS260 L36:351-358	0.2	2.0
Selwyn	NZMS260 L36:456-301	0.8	7.0
Selwyn	NZMS260 L36:441-305	0.8	8.5
Selwyn	NZMS260 L36:350-345	0.4	2.5
Selwyn	NZMS260 L36:435-299	0.4	3.5
Selwyn	NZMS260 L35:289-421	0.4	3.0
Hororata	NZMS260 L36:337-334	n/a	1.0
Table 2 – discharges to land			

For the purposes of this consent, emergency peak flow is the maximum rate at which bywash water is discharged in emergency situations, such as a power failure.

12. The inlet(s) to the wetland shall be designed and constructed with appropriate protection to prevent erosion and scour.
13. Each wetland shall be designed and constructed to retain and infiltrate water discharged from the headrace and water distribution network.
14. The wetland shall:
 - (a) Be vegetated with water tolerant species;
 - (b) Have a base that extends into free draining gravels; and
 - (c) Have at least one metre separation distance between the base and the highest seasonal groundwater level at the site before the exercise of this consent.
15. At least one month prior to the construction of each wetland, the consent holder shall submit to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, design plans and supporting calculations for the wetland to be installed sufficient to demonstrate compliance with conditions 12, 13 and 14. The information submitted shall include, but not be limited to, the following:
 - (a) evidence of infiltration testing carried out at the wetland location, and the results of that testing;

- (b) the infiltration area of the wetland;
 - (c) a minimum infiltration rate of the base of the wetland; and
 - (d) the volume of the wetland.
16. There shall be no ponding or flooding on surrounding land as a result of the discharge to the wetlands.
17. Within 20 working days of the installation of the stormwater system, a certificate signed by a Chartered Professional Engineer (CPEng) with stormwater system experience shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, to certify that the stormwater system complies with conditions 12, 13 and 14 of this consent.

Maintenance

18. The wetlands and discharge points into rivers shall be inspected at least once every six months.
19. The wetlands shall be maintained such that the infiltration rate is equal to or greater than the minimum rate required to dispose of the water discharged into the wetland without surface runoff.
20. The consent holder shall be responsible for rectifying as soon as practicable any erosion that occurs as a result of the discharge to:
- (a) the bed or banks of any river; or
 - (b) any constructed wetland
21. The consent holder shall keep records of all inspections and maintenance undertaken in accordance with conditions 18 to 20. These records shall include, but not be limited to:
- (a) date and details of inspections of the wetland; and
 - (b) date and details of any maintenance work, repairs and upgrades to the wetland, including removal of material and its disposal.
 - (c) these records shall be made available to the Canterbury Regional Council on request.

CRC061980 Discharge diverted water into the Rakaia River

To discharge water that has been diverted, but not taken, back into the Rakaia River, via sediment sluicing, fish pass and bypass channels that form part of the Rakaia water intake system. A consent with a duration of 35 years is sought.

Proposed conditions:

1. The discharge of water and sediment laden water shall only be water that has been diverted in accordance with resource consent CRC061940 via sediment sluicing , fish pass and bypass channels.
2. The discharge shall be into the Rakaia River, at about map reference NZMS 260 K36: 083-379 as shown on the attached plan CRC061980..
3. The discharge of water shall be into an active channel of the Rakaia River.

4. This consent is subject to the conditions listed in Schedule 1: General Conditions and Schedule 2: Administrative Conditions, which forms part of this consent.
5. Fish return flows diverted under consent CRC061940 shall where practicable be maintained continuously, at a rate of at least 2 cubic metres per second, from the time the scheme starts taking water at the start of the irrigation season in spring until it ceases taking water at the end of the same irrigation season in the following autumn, to facilitate the return of migrant fish to the main stem of the river.
6. The discharge of water shall not cause significant erosion of the bed or banks of any watercourse.
7. The discharge shall not prevent the passage of fish along the diversion and discharge channel and particular regard shall be given to avoiding the stranding of fish in pools or channels
8. Sediment sluicing shall only occur when the flow in the Rakaia River as estimated by Canterbury Regional Council from measurements at either the gorge recorder site (at or about map reference NZMS 260 K35:015-424) or the recorder site at Fighting Hill (at or about map reference NZMS 260 K35:997-437) exceeds 300 cubic metres per second.
1. [Numbering??] The discharge from sediment sluicing shall only occur during the mornings of weekdays that are not public holidays, at a time determined in consultation with the Regional Engineer at the Canterbury Regional Council.
9. Warning signs shall be erected in the riverbed downstream of the intake structures as directed by the Regional Engineer at the Canterbury Regional Council.
10. After allowing for reasonable mixing of the discharge with the receiving water, and as a result of the exercise of this consent:
 - (a) The discharge shall be substantially free from suspended solids;
 - (b) After allowing for reasonable mixing of the discharge with the receiving water:
 - (c) the natural water temperature shall not be changed by more than three degrees Celsius
 - (d) The waters shall not be tainted so as to make them unpalatable, nor contain toxic substances to the extent that they are unsafe for consumptions by humans or by farm animals, nor shall they emit objectionable odours;
 - (e) There shall be no destruction of natural aquatic life by reason of a concentration of toxic substances;
 - (f) The natural colour and clarity of the water shall not be changed to a conspicuous extent;
 - (g) The oxygen content in solution in the water shall not be reduced below 6 milligrams per litre

For the purpose of this consent, reasonable mixing is confined to a mixing-zone that:

(A) is no longer than 10 times the wetted channel width; and

(B) is no longer than 100 metres along the longest axis of the zone; and

(C) does not occupy greater than one third of the wetted channel width.

Note: the wetted channel width is the width of water in the braid receiving the discharge.

11. The discharge of water shall not result in an increase in turbidity or reduction in clarity of the river flow which, in the opinion of a suitably qualified expert, hinders the upstream passage of salmon in the Highbank salmon bypass channel
12.
 - (a) Prior to the exercise of this consent, the consent holder shall commission a suitably qualified salmonid fisheries expert, with post-graduate qualifications in aquatic sciences, or an expert with extensive experience in salmonid fishery science or management, to develop a Diversion and Discharge Management Plan (the Plan). The purpose of the Plan is to ensure the works and discharges in the Rakaia River by the consent holder do not hinder upstream passage of salmon in the Highbank salmon bypass channel and to ensure compliance with condition 11 of this consent.
 - (b) The Plan shall be developed in consultation with the operator of the Highbank Power Station, which as a minimum shall require that the consent holder forward a copy of the Plan to the operator of the Highbank Power Station seeking their comment not less than 20 working days prior to submitting the Plan to the Canterbury Regional Council in accordance with condition 14 of this consent and any comments received shall be taken into account when preparing the Plan and forwarded to the Canterbury Regional Council along with the Plan. The Plan shall include the following:
 - (i) An outline of operational requirements of discharges back to the Rakaia River to ensure upstream passage of salmon in the Highbank salmon bypass channel is not hindered.
 - (ii) A monitoring programme to determine whether or not salmon passage in the Highbank salmon bypass channel is affected, including monitoring methodology, who may be suitable to undertake the monitoring and the frequency of monitoring
 - (iii) Methods that may be undertaken to reduce any effects on upstream passage of salmon in the Highbank salmon bypass channel if monitoring indicates that the diversion and/or discharge of water is affecting salmon passage
13. Prior to the discharge of water in the Rakaia River, the consent holder shall submit the Diversion and Discharge Management Plan to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager for their approval that the Plan meets the requirements set out in condition 12.
14. The consent holder shall adhere to the Diversion and Discharge Management Plan at all times.
15. In the event that the monitoring and reporting required in condition 13(b) indicates that the discharge is affecting upstream passage of salmon, then the consent holder shall ensure that the methods specified in 13(b)(iii) are implemented to mitigate the effects.

16.

- (a) The discharge of water shall not result in a situation where there is not a significant, continuous braid reaching the upstream (inlet) end of the salmon bypass channel of the south bank of the Rakaia River at the Highbank power station tailrace. The amount of water in that river braid shall be sufficient to allow the upstream passage of salmon emerging from the Highbank salmon bypass channel.
- (b) If, as a result of the discharge of water authorised by this consent, works need to be undertaken to the Highbank salmon bypass channel to maintain an interconnection with a main flow of the Rakaia River to ensure the effective passage of salmon from the bypass back to the river, then the consent holder shall either:
 - (i) Reimburse the operator of the Highbank Power Station for the costs of the works no later than the 20th of the following month following the request for payment being made, if the operator of the Highbank Power Station has first rectified this situation, or
 - (ii) Undertake the works to rectify this situation, subject to the works being first approved by the operator of the Highbank Power Station.

CRC061982 Discharge diverted water into the Waimakariri River

To discharge water that has been diverted but not taken, back into the Waimakariri River, via sediment sluicing, fish pass and diversion channels that form part of the Waimakariri water intake system. A consent with a duration of 35 years is sought.

Proposed conditions:

- 2. The discharge of water and sediment laden water shall only be water that has been diverted in accordance with resource consent CRC061943 via sediment sluicing , fish pass and bypass channels
- 3. The discharge shall only be to the Waimakariri River, at about map reference NZMS 260 L35:336-583 as shown on the attached plan CRC061982.
- 4. The discharge of water shall be into an active channel of the Waimakariri River.
- 5. This consent is subject to the conditions listed in Schedule 1: General Conditions and Schedule 2: Administrative Conditions.
- 6. The rate at which water is discharged to the Waimakariri River from the fish pass shall be at least 2 cubic metres per second.
- 7. The discharge shall not prevent the passage of fish along the diversion and discharge channel and particular regard shall be given to avoiding the stranding of fish in pools or channels.
- 8. Fish return flows diverted under consent CRC061943 shall where practicable be maintained continuously, at a rate of at least 2 cubic metres per second, from the time the scheme starts taking water at the start of the irrigation season in spring until

it ceases taking water at the end of the same irrigation season in the following autumn, to facilitate the return of migrant fish to the main stem of the river.

9. The discharge shall not cause erosion of the bed or banks of any watercourse.
10. The discharges into the Waimakariri River shall not result in any of the following:
 - (a) production of conspicuous oil or grease films, scums or foams, or floatable or suspended materials.
 - (b) conspicuous change in the colour or decrease in visual clarity. A conspicuous change in colour shall be defined as a change greater than 10 points on the Munsell scale. A conspicuous decrease in visual clarity shall be defined as a change greater than 33 percent, as measured by black disc or clarity tube.
 - (c) emission of objectionable odour.
 - (d) an increase in maximum cover of stream or river beds by periphyton as filamentous growths or mats greater than 3 millimetres thick, to greater than 25 percent cover.
 - (e) Visible plumose growth or mats of bacterial or fungal slime growths (also known as heterotrophic growths or sewage fungus).
 - (f) an exceedence of 2 grams per cubic metre of BOD₅ of GF/C filtered water.
 - (g) The concentration of dissolved oxygen exceeding 80 percent of saturation concentration.
 - (h) Fish and other aquatic organisms shall not be rendered unsuitable for human consumption.
 - (i) a statistically measurable impairment of the reproductive ability of fish or of the food of fish. There shall be no toxic effect on fish or on the food of fish. For the purpose of this standard, fish, and the food of fish, do not include any organisms specified as a pest in a pest management strategy under the Biosecurity Act 1993.
 - (j) An increase in the natural temperature of the water by more than 3 degrees celsius, and the temperature of the water, as a result of the exercise of this consent, shall not adversely affect the spawning of trout or salmon during the spawning season.
 - (k) The median faecal coliform concentration of not less than five samples taken within any consecutive 30 day period, shall not exceed 200 faecal coliforms per 100 millilitres; furthermore, no more than 20% of samples within any consecutive 30 day period shall exceed 800 faecal coliforms per 100 millilitres.
 - (l) The quality of the water shall not be altered in those characteristics which have a direct bearing upon the objectionable nature to Tangata Whenua of contamination of surface waters by treated or untreated human sewage.
 - (m) The water shall not be rendered unsuitable for consumption by farm animals.
11. Sediment sluicing shall only be undertaken when the unmodified flow in the Waimakariri River, as estimated by the Canterbury Regional Council from measurements at the Old Highway Bridge, at or about map reference NZMS 260 M35:818-547, exceeds 100 cubic metres per second.

12. The discharge from sediment sluicing shall only occur during the mornings of weekdays that are not public holidays, at a time determined in consultation with the Regional Engineer at the Canterbury Regional Council.
13. Warning signs shall be erected in the riverbed downstream of the intakes structures in locations determined in consultation with the Regional Engineer at the Canterbury Regional Council.
14. The consent holder shall ensure that the discharge does not prevent the Canterbury Regional Council and its contractors and agents from accessing the Waimakariri riverbed for the purpose of operation and maintenance of the Waimakariri River Flood Protection Scheme.

CRC102336 Discharge contaminants and dust to air during scheme construction

This application is an amalgamation of 061762, CRC061763, CRC061765 and CRC061755 and addresses construction phase works. Duration: 15 years

1. The discharges to air shall only be fugitive dust from the construction activities and contaminants from welding, blasting and painting along the routes of the Intake Systems, Inlet Canal, Headrace Canal, Water Distribution at or about the map references listed in Schedules A.1 to A.4 which form part of this consent, and the water intake systems on the Rakaia River and Waimakariri River, located as shown on the attached plans CRC102336, which form part of this consent.
2. The activities shall be undertaken in accordance with the conditions listed in Schedule1: General Conditions, and Schedule 2: Administrative Conditions, which forms part of this consent.
3. The consent holder shall submit to the Canterbury Regional Council at least one month prior to the commencement of works an Air Quality Management Plan outlining the construction practices and procedures to be adopted in order to:
 - (a) ensure compliance with the conditions of this consent;
 - (b) ensure the adverse effects of construction activities are minimised to the greatest extent practicable; and
 - (c) ensure the adverse effects of discharges from welding blasting and painting activities are minimised to the greatest extent practicable.
4. The Air Quality Management Plan shall include, but not be limited to:
 - (a) the identification of construction areas where dust and contaminants are likely to be generated;
 - (b) the types of construction methods to be adopted;
 - (c) the mitigation measures to be adopted to minimise the effects of dust and contaminants beyond the boundary of the construction site;
 - (d) the location of meteorological monitoring instruments as specified in condition (6); and
 - (e) the contact detail for the person in charge of the site works.

5. All practicable measures shall be taken to limit the duration and frequency that dust and contaminants associated with construction activities is discharged to air.
6. Wind Monitoring
 - (a) The consent holder shall install meteorological monitoring instruments at three locations in the scheme area.
 - (b) The meteorological monitoring instruments shall to be located at sites likely to be representative of the metrological conditions at the construction sites.
 - (c) The meteorological monitoring instruments shall be installed at a height of at least three metres above ground level.
 - (d) The meteorological monitoring instruments shall continuously monitor and record wind speed and wind direction.
 - (e) The data shall be recorded as ten minute averages.
 - (f) The consent holder shall ensure that the monitoring system is fitted with appropriate systems that will trigger alarms when specified meteorological conditions are reached so that activities can be managed.
7. The consent holder shall adopt all practicable measures to minimise the emissions of fugitive dust. These will include, but are not limited to:
 - (a) Regular cleaning of sealed surfaces to prevent accumulation of dust;
 - (b) Wetting down of unsealed surfaces with sufficient water to ensure dust discharge is minimised;
 - (c) Wetting unsealed surfaces at least hourly when wind speeds are greater than 18 kilometres per hour; and
 - (d) Ensuring material excavated from the river is wetted with sufficient water to ensure dust discharge is minimised.
8. The discharge shall not cause deposition of particulate matter to the extent that it is offensive or objectionable beyond the construction site on which the consent is exercised.
9. The consent holder shall take all practicable measures to prevent the discharge of dust from on-site transportation. This shall include, but not be limited to:
 - (a) Applying water to suppress dust on unsealed surfaces, as required;
 - (b) Restricting vehicle speeds;
 - (c) Preventing overloading to avoid spillages of transported material.
10. A record of any complaints relating to particulate matter shall be maintained and include:
 - (a) Location where particulate matter was detected;
 - (b) Date and time when particulate matter was detected;
 - (c) A description of the physical conditions including wind speed and direction;
 - (d) The most likely cause of the particulate matter detected;
 - (e) Any corrective action undertaken by the consent holder to avoid, remedy or mitigate suspension of the particulate matter.

11. The Canterbury Regional Council may, once per year, serve notice of its intention to review the conditions of this consent for the purposes of dealing with any adverse effect on the environment which may arise from the exercise of the consent and which it is appropriate to deal with at a later stage.
12. The lapsing date for the purposes of section 125 of the Resource Management Act 1991 shall be 8 years from granting of consent.

CRC102337 Discharge contaminants and dust to air during scheme operation and maintenance

This application is an amalgamation of 061762, CRC061763, CRC061765 and CRC061755 and addresses operation and maintenance phase works. Duration: 35 years

1. The discharges to air shall only be fugitive dust from the operation and maintenance activities and contaminants from welding, blasting and painting along the routes of the Intake Systems, Inlet Canal, Headrace Canal, Water Distribution at or about the map references listed in Schedules A.1 to A.4 which forms part of this consent and the water intake systems on the Rakaia River and Waimakariri River, located as shown on the attached plan CRC102337, which form part of this consent
2. The activities shall be undertaken in accordance with the conditions listed in Schedule 1: General Conditions, and Schedule 2: Administrative Conditions, which forms part of this consent.
3. The consent holder shall submit to the Canterbury Regional Council at least one month prior to the commencement of works an Air Quality Management Plan outlining the operation and maintenance practices and procedures to be adopted in order to:
 - (a) ensure compliance with the conditions of this consent;
 - (b) the effects of construction activities are minimised to the greatest extent practicable; and
 - (c) ensure the adverse effects of discharges from welding blasting and painting activities are minimised to the greatest extent practicable.
4. The Air Quality Management Plan shall include, but not be limited to:
 - (a) the identification of operation and maintenance areas where dust and contaminants are likely to be generated;
 - (b) the mitigation measures to be adopted to minimise the effects of dust beyond the boundary of the construction site; and
 - (c) the contact details for the person in charge of the site works.
5. All practicable measures shall be taken to limit the duration and frequency that dust associated with construction activities is discharged to air.
6. The consent holder shall ensure that the monitoring system is fitted with appropriate systems that will trigger alarms when specified meteorological conditions are reached so that activities can be managed.

7. The consent holder shall adopt all practicable measures to minimise the emissions of fugitive dust. These will include, but are not limited to:
 - (a) Regular cleaning of sealed surfaces to prevent accumulation of dust;
 - (b) Wetting down of unsealed surfaces with sufficient water to ensure dust discharge is minimised;
 - (c) Wetting unsealed surfaces at least hourly when wind speeds are greater than 18km/hour; and
 - (d) Ensuring material excavated from the river is wetted with sufficient water to ensure dust discharge is minimised.
8. The discharge shall not cause deposition of particulate matter to the extent that it is offensive or objectionable beyond the construction site on which the consent is exercised.
9. The consent holder shall take all practicable measures to prevent the discharge of dust from on-site transportation. This shall include, but not be limited to:
 - (a) Applying water to suppress dust on unsealed surfaces, as required;
 - (b) Restricting vehicle speeds;
 - (c) Preventing overloading to avoid spillages of transported material.
10. A record of any complaints relating to particulate matter shall be maintained and include:
 - (a) Location where particulate matter was detected;
 - (b) Date and time when particulate matter was detected;
 - (c) A description of the physical conditions including wind speed and direction;
 - (d) The most likely cause of the particulate matter detected;
 - (e) Any corrective action undertaken by the consent holder to avoid, remedy or mitigate suspension of the particulate matter.

Schedule 1: General Conditions

General Conditions

1. All practicable measures shall be undertaken to minimise and mitigate adverse effects on property, amenity values, wildlife, vegetation and ecological values.
2.
 - (a) The consent holder prepare an Environmental Construction Management Plan (ECMP) detailing the construction activities and the procedures that shall be undertaken to comply with the conditions of this consent and to minimise and mitigate effects of construction activities to the greatest extent practicable. .The matters to be addressed in the ECMP shall include the following:
 - (i) General
 - (A) Plan Purpose
 - (B) The practices and procedures to be adopted to achieve compliance with the conditions of the designation
 - (C) Plan Revision and Compliance Issue Resolution Processes
 - (D) ECMP/Management Plan Certification Process
 - (E) Roles and Responsibilities
 - (ii) Mitigation of Adverse Effects
 - (A) Environmental Objectives and Principles
 - (B) Environmental Management Approach and Methods
 - (iii) Plan Requirements and the annual environment report process
 - (b) ECMP there will be the following sub-plans to ensure compliance with specific conditions on each consent.
 - (i) Construction Phase Management Plan
 - (ii) Public Health and Safety Plan
 - (iii) Traffic Management Plan
 - (iv) Landscape and Rehabilitation Management Plan
 - (v) Noise and Vibration Management Plan
 - (vi) Terrestrial Ecology Protection Plan
 - (vii) Remediation Action Plan
 - (viii) Waste Management Plan
 - (ix) Hazardous Substances/Spill Contingency Management Plan
 - (x) Archaeological and Heritage Management Plan
 - (xi) Dust Control Management Plan
 - (xii) Mudfish management plan
 - (xiii) Diversion and discharge plan

Note: That the only Management Plans in conditions 2(b)(iv), (ix) and (x) to (xiii) relate to matters within the functions of the Canterbury Regional Council and not those of the Selwyn District Council. [check the wording here for meaning]

3. The ECMP shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager at least 30 working days prior to the commencement of works.
4. The consent holder may, at any time, submit to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager an amended Environmental Construction Management Plan provided it is for the purpose of improving the efficiency and/or quality of the construction works, and/or better avoiding, mitigating or remedying adverse effects.
5. At least 20 working days prior to the start date of the works, the consent holder shall notify the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, in writing, of the proposed start date.

Mudfish Management Plan

6.
 - (a) Prior to exercising this consent, the consent holder shall commission a suitably qualified expert with knowledge and experience with assessments of Canterbury Mudfish populations to prepare a Mudfish Management Plan in consultation with the Department of Conservation.
 - (b) The purpose of the Mudfish Management Plan is to ensure that the scheme effects on Canterbury Mudfish (*Neochanna burrowsius*) populations and their habitat within the Central Plains Water Enhancement Scheme area are no more than minor.
 - (c) The expert as defined in condition 6(a) shall survey the scheme area for Canterbury Mudfish populations and habitats prior to preparing the Plan.
 - (d) The Mudfish Management Plan shall include the following:
 - (i) a map identifying Canterbury Mudfish populations and potential habitats within the scheme area and their current state; and
 - (ii) an assessment of the potential effects on the Canterbury Mudfish populations and their habitat from changes in flows and water levels in wetlands, ponds, water races, rivers and streams, and from works within the beds of rivers, water races and or streams, or in wetlands; and
 - (iii) mitigation or offset measures that the consent holder shall adopt to ensure that the effects on the Canterbury Mudfish and their habitat will be no more than minor. Mitigation and offset measures may include, but not be limited to, the following:
 - (A) mechanisms to exclude predators/competitors from mudfish habitat in areas where predators/competitors are currently unable to regularly access the habitat prior to the Scheme being commissioned;
 - (B) mechanisms to manage beneficial water levels in mudfish habitats;
 - (C) enhancements of mudfish habitats through fencing, planting, and pest control; and

- (D) proposed translocation or re-establishment of populations in suitable areas.
 - (iv) a strategy to make available and communicate the plan information and requirements to scheme landowners and operators; and
 - (v) recommended ongoing monitoring and reporting requirements to demonstrate that the plan implementation has been effective and that effects of the scheme on mudfish in the area are no more than minor.
- 7.
- (a) The consent holder shall submit the Mudfish Management Plan to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager to certify that the Plan meets the objectives set out in condition 6(b).
 - (b) The consent holder shall submit the name and qualifications of the author of the Mudfish Management Plan to the Canterbury Regional Council with the Mudfish Management Plan.
 - (c) The Canterbury Regional Council shall give written notice to the consent holder stating whether or not the Mudfish Management Plan complies with condition 6 within 20 working days of receiving the Mudfish Management Plan.
 - (d) Any amendments to the Mudfish Management Plan shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager. The amendments shall be certified by a suitably qualified person with experience and knowledge with assessments of Canterbury Mudfish populations, that the amended Mudfish Management Plan meets the objectives set out in condition 6(b).
 - (e) The consent holder shall report on the effectiveness of the plan, and effectiveness of any mitigation or offset measures implemented, at least at five yearly intervals (by 30 June each fifth year), or more frequently if recommended in the plan. The report shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager.
8. The consent holder shall adhere to the Mudfish Management Plan, or any amendments to the Mudfish Management Plan, at all times.
9. Where activities involve works in the beds and margins of rivers or water courses, the consent holder shall ensure:
- (a) Fish and Game New Zealand - Central South Island Region and The Department of Conservation are notified of the intention to carry out works, and their intended type, no less than two working days prior to their commencement.
 - (b) all practicable measures shall be undertaken to:
 - (i) keep to established tracks and stream crossings; and
 - (ii) prevent debris, soil and vegetation entering the watercourse; and
 - (c) the activity shall not restrict access to flood control structures and/or flood control vegetation for the purposes of their repair or maintenance.
 - (d) Birds

- (i) The consent holder shall ensure that prior to any mechanical works being carried out in the period 1 September to 1 February:
 - (A) a suitably qualified and independent person, with experience and expertise in the identification of avifauna that nest in riverbeds and their breeding sites, inspects the proposed area of works, no earlier than eight working days prior to any works being carried out, and locates any breeding sites of the bird species listed in Appendix A;
 - (B) the person carrying out the inspection prepares a written report that identifies all the located bird breeding or nesting sites and provides copies of that report to the consent holder and the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager;
 - (C) the name and qualifications of the person carrying out the inspection are provided to the Canterbury Regional Council with the report;
 - (D) any person carrying out works authorised by this consent are informed of any bird breeding or nesting sites located; and
 - (E) where work ceases for more than 10 days, the site will be re-inspected for bird breeding and nesting sites in accordance with parts (a) to (d) of this condition.
- (ii) As far as practicable, vehicles and/or machinery shall not operate within 100 metres of birds which are nesting or rearing their young in the bed of the river. Where this is not practicable the consent holder will arrange either relocation as recommended by and under the supervision of the expert as defined in condition 9(d)(i)(A), or alternatively offset mitigation of equivalent value to avifauna as recommended by that expert.

For the purposes of this condition birds are defined as those bird species listed in Appendix A.

(e) Fish

- (i) Prior to any works being carried out in the period 1 October to 30 March the consent holder shall:
 - (A) Commission a suitably qualified and independent person, with experience and expertise fish migration provides a report certifying that the effects from the proposed works on fish migration will be no more than minor; and
 - (B) submit the report to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, along with the name, qualifications and experience of the author of that report.
- (ii) No works in flowing water shall take place in the Selwyn, Hororata and Hawkins River during the trout spawning period of 1 May to 30 September

Comment [A14]: As per F&G email.

- (f) The activities, structures and any associated equipment, materials, or debris, shall not obstruct or alter the passage of water in a manner that causes:
 - (i) an increase in the risk or potential for flooding of surrounding land;

- (ii) destabilisation of lawfully established flood control vegetation , flood control structures or any other lawfully established structures within the beds of rivers;
- (iii) an increase in erosion of river beds or banks;
- (g) The works shall not prevent the passage of fish, and all practicable measures shall be undertaken to prevent the stranding of fish in pools or channels.
- (h) Machinery shall be free of plants and plant seeds prior to use in the riverbed.
- (i) No plant species listed in Schedule BLR1 of Chapter 6 “Beds and margins of lakes and rivers” of the Proposed Canterbury Natural Resources Regional Plan shall be planted.
- (j) To prevent the spread of Didymo or any other aquatic pest, the consent holder shall ensure that activities authorised by this consent are undertaken in accordance with the Biosecurity New Zealand’s hygiene procedures.

Note: You can access the most current version of these procedures from the Biosecurity New Zealand website <http://www.biosecurity.govt.nz> or Canterbury Regional Council Customer Services.
- (k) Within forty working days of the completion of the construction works, the consent holder shall supply the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, a complete set of “as-built” plans confirming the location of the works.
- (l) Within forty working days of completion of the construction works, the consent holder shall report to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, certifying that all construction debris or other materials from the construction works has been removed.
- (m) The consent holder shall maintain and keep a complaints register for all aspects of all operations in relation to construction activities. The register shall detail the date, time and type of complaint, cause of the complaint, and action taken by the consent holder in response to the complaint. The register shall be available to the Canterbury Regional Council upon their request.
- (n) All disturbed areas shall be stabilised and/or revegetated following completion of the works.
- (o) No structure and/or site works shall preclude existing access to the riverbed.

Accidental Discovery

10. This protocol shall cover archaeological sites, historic sites and historic buildings classified under the Historic Places Act 1993. Where appropriate, all contractors, project managers and stakeholders shall be inducted into the protocol and made aware of their individual responsibilities under the protocol.
- (a) In the event of any disturbance of Koiwi Tangata (human bones) or taonga (treasured artefacts), the Requiring Authority shall immediately:
 - (i) Advise the Te Rūnanga o Ngāi Tahu, Te Taumutu Rūnanga, or their representative, and the Canterbury Regional Council of the disturbance;

- (ii) Cease earthmoving operations in the affected area until the area containing the Koiwi Tangata or taonga has been clearly demarcated, and Kaumatua and archaeologists have certified that it is appropriate for earthmoving to recommence.
- (b) In the event of accidental discovery of archaeological remains, the following steps shall be taken:
 - (i) All activity affecting the immediate area shall cease and the Regional Archaeologist of the New Zealand Historic Places Trust shall be contacted;
 - (ii) The site shall be secured to ensure that the remains are not further disturbed;
 - (iii) Further works affecting the remains will not commence until either:
 - (A) The Regional Archaeologist of the New Zealand Historic Places Trust has confirmed in writing that the archaeological provisions of the Historic Places Act 1993 do not apply; or
 - (B) The requirements of the archaeological provisions of the Historic Places Act 1993 have been met, and if required, and archaeological authority has been granted by the New Zealand Historic Places Trust.
- (c) If human remains / koiwi tangata are located, in addition to the above steps, the Runanga representative for the area and the New Zealand Police must be contacted.
- (d) The above protocol shall only be amended in consultation with the New Zealand Historic Places Trust (NZHPT) Te Rūnanga o Ngāi Tahu and Te Taumutu Rūnanga. Once finalised, copies shall be lodged with those parties and the Canterbury Regional Council prior to any construction commencing.

Schedule 2: Administrative Conditions

1. The lapsing provisions of Section 125 of the Resource Management Act 1991 shall not apply until after the expiry of eight years from the commencement date of this consent.

Environmental Management Fund

2. Prior to the exercise of this consent, the consent holder shall establish an Environmental Management Fund (EMF) to be managed and distributed by an independent Environmental Management Fund Committee (EMFC) for the purpose of:
 - (a) environmental mitigation of the effects of the operation of the water enhancement scheme which is not otherwise required by the individual Farm Management Plan or specific consent conditions; and
 - (b) environmental management projects within the area affected by the operation of the scheme as shown on Plan CRC061973A.
3. Prior to the exercise of this consent, the consent holder shall establish an EMFC. There shall be at least six members on the EMFC and shall include representatives of:
 - (a) Central Plains Water Trust or Central Plains Water Limited;
 - (b) community interests; and
 - (c) the regional and district consent authorities.
4. The fund shall not be utilised for any of the following:
 - (a) measures required by conditions, the Sustainability Protocol or Farm Management Plans;
 - (b) any administration or education associated with consent conditions, the Sustainability Protocol or Farm Management Plans.
5. The consent holder shall submit a report to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Officer which details the following:
 - (a) fund structure and management;
 - (b) the level of levy (initially at least \$0.40 per share per annum);
 - (c) criteria for seeking, selecting and approving applications;
 - (d) criteria for a rebate of the levy to recompense water users for the capital costs of environmental enhancement work on water users' own properties, which is not otherwise required by their Farm Management Plan or the consent conditions (up to 50% rebate of the levy paid by any one water user in any one year).
6. By the time 10,000 hectares of land is irrigated under this scheme, the EMF shall have a minimum amount of \$300,000. Each water user that enters a Water Users Agreement with the consent holder shall commence paying the levy from the date which the Water Users Agreement is signed.
7. The levy shall increase annually based on the all groups consumer price index as published quarterly by Statistics NZ. The initial rate of 40 cents per share shall be

Comment [U15]: The

Comment [A16]: See accompanying report for explanation.

established as equivalent to the all groups consumer price index for 1 July 2010. The first annual adjustment of the levy shall take place on 1 July 2011.

8. The priority for the distribution and use of the scheme Environmental Management Fund, shall be the following environmental mitigation if it is not also required by the individual Farm Management Plans or consent conditions specified in CRC061973 and the Groundwater and Drainage Plan:
 - (e) Minimising nutrient losses to lowland streams and Lake Ellesmere/Te Waihora;
 - (f) Excluding stock from wetlands, riparian margins and beds of rivers and streams,
 - (g) Physical protection of indigenous vegetation planting along riparian margins;
 - (h) Wetland enhancement and wetland creation, including the development of wetlands along intermittent streams;
 - (i) Permanent protection of wetland areas that may contain mudfish.

Sustainability Protocol

9. The consent holder shall comply with the Sustainability Protocol attached to this consent, which provides details of the practices and procedures to be put into place to operate the Central Plains Water Enhancement Scheme.
10. The Sustainability Protocol shall be used to develop the Farm Management Plans as prescribed in accordance with resource consent CRC061973.

Community Liaison

11. The consent holder shall, prior to the exercise of this consent, undertake an open, public process to offer membership positions on a Community Liaison Group.
12. The Community Liaison Group shall consist of a maximum of six persons with a preference for representatives who can each demonstrate skills or knowledge in at least one of the following:
 - (a) Recreational uses of the Waimakariri River or Rakaia River;
 - (b) Sustainable irrigated agricultural practices;
 - (c) Water quality and sustainable land management;
 - (d) Community and/or business in Central Canterbury;
 - (e) Lowland drainage network operation;
 - (f) Management of indigenous biodiversity.
13. The members of the Community Liaison Group shall, at the consent holder's expense, be offered:
 - (a) the opportunity to meet every six months, or less frequently as determined by the Community Liaison Group,
 - (b) an annual inspection of the Scheme area, and

- (c) the provision of any information to which Canterbury Regional Council is entitled by virtue of this consent,
14. If the Community Liaison Group elects to hold a meeting in accordance with Condition 14, then the Scheme Manager or their nominated representative shall attend the meeting.
 15. At least one representative from each of Canterbury Regional Council (in its resource consent regulatory capacity); Canterbury Regional Council (in its river and drainage management capacity); and Selwyn District Council shall be invited to attend meetings.
 16. The main purposes of the meetings of the Community Liaison Group are to:
 - (a) Provide input and feedback into the preparation, implementation, review and amendment of the Farm Management Plan templates as required by consent CRC061973;
 - (b) Be presented by, and discuss with, the consent holder the results of monitoring and reporting as required by the conditions of this consent, including the Annual Environmental Report and the annual overall audit report on compliance with the Farm Management Plans, prepared by the consent holder;
 - (c) Discuss, as far as practicable, any community concerns regarding the operation of the Central Plains Water Enhancement Scheme.
 - (d) Review and recommend to the consent holder projects for the distribution of funds from the environmental levy to environmental mitigation projects in accordance with Condition 2(b).
 17.
 - (a) The members of the Community Liaison Group shall be offered the opportunity to review and comment on:
 - (i) the initial Scheme Environmental Management Plan; and
 - (ii) the initial Farm Management Plan templates,
 - (iii) the reviews of and any amendments to the Scheme Environmental Management Plan and Farm Management Plan templates; and
 - (iv) the consent holder's Annual Environmental Report including the annual overall audit report on compliance with the Farm Management Plans.
 - (b) The Community Liaison Group shall be provided with the opportunity to submit information to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager annually in relation to the review of the Scheme Environmental Management Plan and the template for the Farm Management Plans.

Groundwater and Lowland Drainage

Groundwater and Lowland Drainage

18. The consent holder shall avoid, remedy or mitigate adverse effects on groundwater and lowland drainage which occur as a result of the exercise of this consent.
19. Groundwater Technical Review Panel
 - (a) Prior to the commencement of any activities authorised by these consents (including the finalisation of the Groundwater and Drainage Plan listed in condition 20), the consent holder shall appoint a Groundwater Technical Review Panel (GTRP).
 - (b) The GTRP shall comprise of five to seven people. The panel members shall be selected so that collectively they provide expertise in the following areas:
 - (i) The operation of the Central Plains Water Enhancement Scheme;
 - (ii) Lowland drainage network operations in Canterbury;
 - (iii) Hydrogeology;
 - (iv) Land drainage;
 - (v) Groundwater quality monitoring; and
 - (vi) Surface water monitoring.
 - (c) The GTRP shall comprise at a minimum the following:
 - (i) a technical representative appointed by Central Plains Water Enhancement Scheme management;
 - (ii) a technical representative of drainage schemes management from the lower plains;
 - (iii) an engineer with expertise and experience in both large scale and localised solutions to land drainage needs;
 - (iv) an engineer or scientist with expertise and experience in Canterbury groundwater systems;
 - (v) a technical representative from the Canterbury Regional Council.
 - (d) Reporting
 - (i) At least once per year, the consent holder shall submit a report to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement

Manager, specifying the members of the GTRP, any changes to the GTRP over the previous year, and each member's qualifications and experience.

- (ii) Within 20 working days of receiving the report required under condition 19(d)(i), the Canterbury Regional Council shall inform the consent holder in writing whether or not it agrees that the members of the GTRP meet the criteria set out in conditions 19 (b) and (c).

(e) The role of the GTRP shall be to :

- (i) review the Groundwater and Drainage Plan described in condition 20, and recommend any amendments as it considers appropriate;
- (ii) consult with Te Runanga O Ngai Tahu regarding the monitoring and mitigation measures related to effects on Lake Ellesmere/Te Waihora as proposed in the Groundwater and Drainage Plan; [
- (iii) receive and review reports on the environmental monitoring and mitigation undertaken by the consent holder and any other relevant monitoring results and reports prepared by the Canterbury Regional Council or other bodies;
- (iv) review reports submitted by the consent holder and complaints referred to it in accordance with condition 31, and within two months of the receipt of these reports, convey recommendations to the consent holder regarding the validity of the interpretation of monitoring data and implementation of mitigation measures undertaken by the consent holder;
- (v) determine the likely cause of reported problems with drainage or groundwater including using information gathered in accordance with conditions 24 and 25, propose mitigation or remedial measures and determine the extent to which the consent holder must implement them, or contribute to the cost of implementing them, given the consent holder's degree of contribution to the problem.
- (vi) advise the Canterbury Regional Council if there are grounds to review conditions of consent in the event that an adverse effect arises which is not mitigated or remedied by the consent holder to the extent recommended by the GTRP; and
- (vii) address other matters that may arise from the exercise of consent CRC061973.

Comment [A17]: Consultation as requested by TRONT

(f) The GTRP shall:

- (i) meet no less frequently than once a year; and
- (ii) be funded by the consent holder; and
- (iii) operate on a majority basis; and

- (iv) report no less frequently than once a year on its conclusions and recommendations including any complaints referred to it to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Officer and the consent holder.

20. Groundwater and Drainage Plan

- (a) Prior to the first exercise of this consent, the consent holder shall develop a Groundwater and Drainage Plan outlining the measures undertaken to monitor and mitigate potential adverse effects that may arise in regard to the following issues:
 - (i) Loss of Waimakariri River seepage on the Christchurch-West Melton and Kaiapoi aquifer systems; and
 - (ii) Increase in the concentrations of nitrate-nitrogen or other contaminants in the groundwater both beneath and downstream from the Scheme area; and
 - (iii) Raised groundwater levels both beneath and downstream from the Scheme area; and
 - (iv) Increase in the concentrations of contaminants, including nitrate-nitrogen and phosphorus in surface water bodies and Lake Ellesmere/Te Waihora.
- (b) The key objectives of the Groundwater and Drainage Plan shall be to outline the groundwater and surface water monitoring and reporting programme and to describe how the consent holder will avoid, remedy or mitigate adverse effects on groundwater quantity, groundwater quality, surface water levels, surface water quality and lowland drainage which occur as a result of the exercise of this consent.
- (c) The Groundwater and Drainage Plan shall be submitted to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager in two parts:
 - (i) Groundwater and Drainage Plan: Part 1 (location and monitoring); and
 - (ii) Groundwater and Drainage Plan: Part 2 (mitigation and trigger levels).
- (d) Part 1 of the Groundwater and Drainage Plan shall include:
 - (i) The location of all farms using water from the Central Plains Water Enhancement Scheme and the associated land use.
 - (ii) The location of all surface water quality monitoring sites.
 - A There shall be at least two monitoring sites in each of the following eight lowland streams that flow into Lake Ellesmere/ Te Waihora: the Halswell River, LII River, Selwyn River, Irwell River, Boggy Creek, Hanmer Road Drain, Doyleston Drain, and Harts Creek. The monitoring sites on lowland stream shall include one site near the spring-fed source in the

upper catchment and one site upstream of the discharge point to Lake Ellesmere/ Te Waihora.

Note that the lower stream sites are those currently monitored on a monthly basis by the Canterbury Regional Council.

- B There shall be at least four monitoring sites in Lake Ellesmere/ Te Waihora.
 - C The consent holder may rely on data collected on Lake Ellesmere/ Te Waihora or lowland streams by the Canterbury Regional Council or any other entity in lieu of establishing new monitoring sites. In the event that this third party monitoring is reduced, then the consent holder shall ensure that the sixteen lowland stream monitoring sites and the four Lake Ellesmere/Te Waihora monitoring sites are maintained.
- (iii) The location, depth and screened interval of specific monitoring bores for assessing effects of the scheme activities on groundwater: specifically groundwater levels, groundwater quality, surface water flow and surface water quality. The minimum requirements for monitoring bores shall be as follows:
- A There shall be at least twenty monitoring bore clusters within the scheme area. At least ten clusters shall be located at the down-gradient boundaries of ten different farms that are irrigated by the scheme. At least ten other clusters shall be located at the down-gradient boundaries of farms that are not irrigated by the scheme. The farms selected shall represent a variety of farm types.
 - B Individual monitoring bores within each cluster shall have a maximum screen length of three metres.
 - C Each monitoring bore cluster shall include a sufficient number of individual bores to cover the fluctuations of the water table at that site, ensuring that the water table is intercepted by at least one bore screen at all times.
 - D The diameters of individual bores shall be sufficient to allow the bores to be purged and sampled according to the sampling procedure specified in condition 26(c).
 - E If one of the scheme farms associated with a monitoring cluster no longer irrigates using water from the scheme, a new cluster shall be established immediately down-gradient of another scheme farm. Similarly, if one of the non-scheme farms associated with a monitoring cluster joins the scheme, a new cluster shall be established immediately down-gradient of another non-scheme farm.
 - F A monitoring bore shall be replaced by a deeper monitoring bore if a monitoring bore is dry for more than six months.

An alternative monitoring programme recommended by the GTRP may form part of the Groundwater and Drainage Plan, to obtain representative samples of groundwater levels and groundwater quality across and down gradient of the scheme area.

ADVICE NOTE: An alternative monitoring programme recommended by the GTRP may include additional monitoring related to the effects on groundwater quality from landfills and waste water systems as a result of increased water levels.

- (iv) The frequency of groundwater level sampling in the monitoring bores identified in the Groundwater and Drainage Plan, with measurements taken at least once per month or any subsequent frequency agreed upon by the GRTP.
 - A Groundwater level measurements shall commence at least one year prior to the use of water under resource consent CRC061973.
 - B The frequency of the water level measurements may only be reviewed by the GRTP two years after the commencement of the use of water under resource consent CRC061973.
- (v) The frequency of groundwater quality sampling in the monitoring bores identified in the Groundwater and Drainage Plan, and shall include the following as a minimum:
 - A For two years prior to, and ten years after the use of water under CRC061973 commences, groundwater quality samples shall be taken from the bores identified in the Groundwater and Drainage Plan in March, June, September and December each year.
 - B Ten years after the use of water under CRC061973 commences, the frequency of groundwater quality sampling shall reduce to twice per year, where each sample shall be taken during August-September and April-May each year.
- (e) Part 2 of the Groundwater and Drainage Plan shall include:
 - (i) A description of the mitigation measures that may be implemented to address all the potential adverse effects related to groundwater level, groundwater quality and surface water flow and quality issues;
 - (ii) A description of the specific triggers that initiate the implementation of the mitigation measures in response to the monitoring outcomes for any effects that may arise related to groundwater levels, increased duration of high groundwater levels, groundwater quality, surface water flows and surface water quality;
 - (iii) The strategy for monitoring and reporting on the effectiveness of the mitigation measures to the Canterbury Regional Council, the GTRP and the affected land owners.

21. The consent holder shall submit Part 1 of the Groundwater and Drainage Plan to the GTRP for its review and recommendations in accordance with condition (20)(e)(i) to certify that the Plan meets the requirements set out in condition 20.
22. Prior to the implementation of the monitoring programme outlined in Part 1 of the Groundwater and Drainage Plan, the consent holder shall submit the Plan: Part 1 to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, including a report from the GTRP certifying that the Plan meets condition 20.
23. Surface water monitoring
Prior to the finalisation of the Groundwater and Drainage Plan: Part 2, the consent holder shall:
- (a) use the existing recent surface water quality data and data collected from the surface water monitoring prior to commencement of irrigation activity, to identify specific baseline nutrient and other contaminant concentration levels in the lowland streams, and annual average mass load of nutrients (Nitrate-N) from streams to Lake Ellesmere.
 - (b) Identify trigger levels as a percentage increase or an absolute concentration increase in nutrient (Nitrate-N) concentration from the agreed mean baseline levels at individual sites, and as a percentage increase or absolute increase from the annual average annual mass load to Lake Ellesmere calculated from the standard monitoring sites and previously determined as the baseline.
 - (c) The trigger levels shall be included in the Groundwater and Drainage Plan: Part 2, and shall be submitted to the GTRP for its review and agreement.
24. Groundwater levels
Prior to the finalisation of the Groundwater and Drainage Plan: Part 2, the consent holder shall:
- (a) Use existing groundwater level data and data collected from the groundwater level monitoring to identify specific groundwater levels that shall trigger a response from the consent holder to avoid, mitigate or remedy any adverse effects related to increased groundwater levels, as a result of exercising this consent, including increased groundwater levels or increased duration of high groundwater levels.
 - (b) The trigger levels shall be included in the Groundwater and Drainage Plan: Part 2, and shall be submitted to the GTRP for its review and agreement.
25. Lowland Drainage
Prior to the finalisation of the Groundwater and Drainage Plan: Part 2, the consent holder shall:
- (a) undertake a baseline survey of the lowland drainage systems of the Central Plains taking into consideration historical data. The survey shall build on existing data, and include:

- (i) An inventory of drains and streams, their location, size and capacity,
 - (ii) An inventory of sewerage systems (reticulated and individual septic tanks),
 - (iii) The conditions of these facilities, their capacities, maintenance activities, dates of installation, histories of water-level related issues,
 - (iv) Records of stream and drain flows and groundwater levels,
 - (v) Existing management and administration arrangements for the drainage schemes,
 - (vi) Current costs of maintenance and operation of the drainage schemes.
- (b) Identify groundwater levels that would trigger the implementation of mitigation measures as specified in condition 24(a). The baseline survey and trigger levels shall be incorporated into the Groundwater and Drainage Plan.

26. Groundwater quality monitoring

- (a) For two years prior to, and ten years after the use of water under CRC061973 commences, groundwater quality samples shall be taken from the bores identified in the Groundwater and Drainage Plan in March, June, September and December each year.
- (b) Ten years after the use of water under CRC061973 commences, the frequency of groundwater quality sampling shall reduce to twice per year, where each sample shall be taken during August-September and April-May each year.
- (c) Water quality sampling shall be undertaken in accordance with the latest version of the Canterbury Regional Council guidelines for the collection of groundwater quality samples.
- (d) As a minimum, the water quality analyses shall include E.coli, pH, electric conductivity, alkalinity, chloride, ammonia-N, nitrate-nitrogen, total-N, dissolved reactive phosphorus and sulphate.

27. Results of Monitoring

- (a) The consent holder shall prepare a report describing the results of the environmental monitoring outlined in the Groundwater and Drainage Plan, for the period from 1 July to the following 30 June for each year.
- (b) The consent holder shall submit the report to the GTRP by the following 1 September. The groundwater report shall include all the monitoring data and an interpretation of background conditions and impacts arising from the consented activities.
- (c) The consent holder shall also submit the report to the Canterbury Regional Council, Attention: Compliance and Enforcement Manager, by 1 September each year.

- (d) Using the results from the environmental monitoring, the consent holder shall prepare Part 2 of the Groundwater and Drainage Plan as specified in condition 20(e).
28. The consent holder shall submit Part 2 of the Groundwater and Drainage Plan to the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Officer prior to the use of water by the Scheme for irrigation. Written confirmation that the Groundwater and Drainage Plan complies with the requirements of this condition must be obtained from the Canterbury Regional Council prior to using water for irrigation. Confirmation shall not be unreasonably delayed or withheld.
29. Prior to 1 October each year, the GTRP shall review the monitoring report described in condition 20(e)(iii) and make recommendations to the consent holder regarding the validity of the interpretation of monitoring data and the implementation of mitigation measures undertaken by the consent holder. Within 20 working days of any meeting of the GTRP, the consent holder shall provide the Canterbury Regional Council, Attention: RMA Compliance and Enforcement Officer, a copy of the recommendations made by the GTRP.
30. Exceedence of Trigger Levels:
- (a) If any bore within the area shown on the attached Plan CRC061973 exceeds a nitrate-nitrogen concentration of 11.3 grams per cubic metre and the bore supplies domestic water to a dwelling that has infants under the age of six months at the time of the exceedence, then the consent holder shall immediately supply an alternative drinking water supply to those dwellings until it can be demonstrated that the concentration of nitrate-nitrogen in the subject bore is below 11.3 grams per cubic metre, unless it can be demonstrated that the concentration of nitrate-nitrogen in the subject bore exceeded 11.3 grams per cubic metre on at least one occasion prior to the use of water by the consent holder or unless it is concluded at the use of water by the consent holder is not the likely cause of the exceedance.
- (b) The Canterbury Regional Council may serve notice on the consent holder of its intention to review the conditions of this consent to deal with any exceedance of any surface water quality trigger level specified in the Groundwater and Drainage Plan, which is due to the exercise of this consent.
- (c) In the event that the groundwater trigger levels specified in the Groundwater and Drainage Plan are reached, the consent holder shall undertake measures to avoid, mitigate or remedy any adverse effects related to groundwater levels that may arise as a result of exercising this consent. Mitigation measures may include but not be limited to;
- (i) additional monitoring;
- (ii) restricting the use of water for irrigation;
- (iii) the widening and/or deepening of drains to increase their capacity;
- (iv) the installation of more drains;

- (v) providing pumped drainage for affected properties or facilities;
- (vi) upgrading sewerage reticulation systems to reduce groundwater infiltration into pipes;
- (vii) more frequent maintenance of existing drains, including cleaning
- (viii) financial compensation in lieu of remedial works.

31. Response to Groundwater Complaints

When the consent holder is notified by a “complainant” of an adverse environmental effect, then:

- (a) Within 10 working days of receipt of the complaint, the consent holder (or a suitably qualified nominee) shall commence an investigation of the complaint.
- (b) Within five working days of completion of its investigation, the consent holder shall notify the complainant of:
 - (i) the outcome of the investigation, including a description of the assessment process that the consent holder has undertaken regarding the issue raised by the complainant;
 - (ii) descriptions of mitigation options, including details of timing and cost sharing;
 - (iii) the complainant's right to refer the complaint to the GTRP, and the contact details of the GTRP.
- (c) The consent holder may offer to mitigate or remedy the situation immediately subject to the complainant agreeing to reimburse the consent holder for the relevant portion of the cost of any such remedy as in condition 31(b)(ii). Such reimbursement will not extend to the consent holder's cost in assessing the complaint or any costs of reviews of the complaint by the GTRP.
- (d) The consent holder may, instead of undertaking any remedial work or completing the assessment process, with the agreement of the complainant choose to negotiate with the complainant to undertake or pay the cost of those remedial works directly to the complainant, or otherwise reach agreement with the complainant in respect of any damage. Any agreement for the consent holder to pay costs directly to the landowner shall be registered on the landowner's title.
- (e) For the purpose of this condition, mitigation or remedy shall include works to an extent that alleviates the significance of the adverse effects of the exercise of this consent.
- (f) The consent holder shall notify the Canterbury Regional Council, Attention: Compliance and Enforcement Manager of any complaints made, any recommendation made by the GTRP, whether or not the consent holder and the complainant are satisfied with the recommendation, and any actions undertaken to remedy the situation.

Bond

32. Prior to the commencement of the activity authorised by this consent, the consent holder shall provide a bond in accordance Schedule 3 attached to this consent.

Review

33. The Canterbury Regional Council may in the last five working days in June and December during the first five years from the date of the first exercise this consent, or until the completion of construction works and thereafter annually on the last five working days of June each year serve notice of its intention to review the conditions of this consent for the purpose of:
- (a) dealing with any adverse effects on the environment which may arise from the exercise of this consent, including on the operation of the Christchurch International Airport;
 - (b) ensuring the adequacy of sampling and/or monitoring programmes;
 - (c) dealing with any adverse effects or other issue identified in any report submitted as a condition of this consent;
 - (d) altering the rate of abstraction from the Rakaia and/or Waimakariri Rivers to correspond to the actual rate of water usage; and/or
 - (e) amending the minimum flow restrictions in the takes from the Rakaia and/or Waimakariri Rivers to reflect any changes in the abstraction rate of the other abstractors from the river;
 - (f) Altering the rate of abstraction from the Waimakairiri River to protect the recharge into the Christchurch-West Melton and Kaiapoi aquifer systems.
34. Charges, set in accordance with section 36 of the Resource Management Act 1991, shall be paid to the Regional Council for the carrying out of its functions in relation to the administration, monitoring and supervision of resource consents and for the carrying out of its functions under section 35 of the Act.

Schedules of Locations referred to in Canterbury Regional Council Consents.

The following Schedules list the locations of the following:

- Schedule A.1: Headrace canal
- Schedule A.2: Water distribution race network
- Schedule A.3: Rakaia River intake and headworks
- Schedule A.4: Waimakariri River (Gorge Bridge) intake and headworks
- Schedules B.1 and B.2: 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: 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 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 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.

Schedule A.2: 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.

Schedule A.3: 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.4: Waimakariri River (Gorge Bridge) intake and headworks

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

Schedule B.1: 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.2: Water distribution race network

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

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

1. Gorge Bridge intake sediment sluice race discharge at about map reference NZMS 260 L35: 344-588
2. 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 SP 2.5 to a wetland adjacent to the Hawkins River at about map reference NZMS 260 L35: 281-574
7. Race C 1 to a wetland adjacent to the Hawkins River at about map reference NZMS 260 L36: 394-330
8. Race C 2 to a wetland adjacent to the Waianiwaniwa River at about map reference NZMS 260 L36: 351-358
9. Race C 3 to a wetland adjacent to the Selwyn River at about map NZMS 260 L36: 350-345
10. Race C 3.1 to a wetland adjacent to the Selwyn River at about map NZMS 260 L35: 289-421
11. Race TP 1 to a wetland adjacent to the Selwyn River at about map NZMS 260 L36: 435-299
12. 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
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

Schedule 3: Bonding

To be replaced with bond condition proposed by Paul Rodger.

New Zealand Dam Safety Guidelines 2000, New Zealand Society on Large Dams

APPENDIX E

OPERATION, MAINTENANCE AND SURVEILLANCE

E.1 Introduction

This Appendix builds on the guidelines for operations, maintenance and surveillance contained in the main text, the focus remaining on matters related to dam safety. Operating and maintenance requirements from functional or asset management perspectives, which would also be included in a complete operating system, are not included. While the surveillance aspects of this Appendix have much in common with those outlined for Commissioning in Appendix D, this Appendix relates to ongoing operations once the dam has been commissioned.

The detail of this Appendix is mainly relevant for Medium and High Potential Impact category dams, but elements are also applicable to Low hazard category dams. Owners of Low Potential Impact dams and their Technical Advisers should assess the following recommendations and adapt appropriate parts for use on their dam. Large parts of these recommendations may be relevant where the asset represented by the dam is of high value and the commercial consequences of dam failure are significant.

It is worth noting that operations, maintenance and surveillance all contribute to the safe performance of the dam and its appurtenant structures.

E.2 Personnel and Training

Safe management of dams is a frame of mind and involves all the people concerned down from the Owner (or senior owner representative), through Managers to Operations Staff. Education and training must therefore be conceived along the lines of developing awareness of the need for ongoing vigilance, surveillance and maintenance in addition to giving instruction in the 'nuts and bolts' mechanics of the relevant and desirable procedures. The training and awareness raising must be related to the specific characteristics and Potential Impact category of the dam.

The Owner is responsible for operating the dam safely and also sets requirements from the viewpoint of protecting asset value. Generally, Owners will not be fully conversant with the technical requirements of operations, maintenance and surveillance to maintain safety. Thus they will rely on advice from the Designer in the case of a new dam or Technical Specialists in the case of existing dams which do not already have formalised procedures. It is important that the Owner ensures that the advice is given by appropriately qualified personnel, who will have received "training" through past experience.

Training will depend on the circumstances, ranging from the Designer training the Owner/Operator of a small Low Potential Impact dam, to Operators of major High Potential Impact dams being taken through structured training courses, seminars, audits and refresher courses. Techniques may embody:

- attendance at relevant seminars (including overseas, e.g. ANCOLD courses)
- membership of NZSOLD and attendance at their seminars
- development of 'in house' procedures and implementation of them in practice
- interaction with other dam owners and getting the benefit of their experience
- keeping up to date through acquisition of the latest guidelines and training materials. Training materials are available from NZSOLD.

Table E.1.
Proficiencies Required for Personnel Involved in Dam Safety Implementation.

GROUP	PRINCIPAL AREAS OF PROFICIENCY
Owner Manager Administrator	<ul style="list-style-type: none"> • Awareness of environmental and financial responsibilities relating to dam safety • Understanding significance of hazard and risk • Support of quality assurance principles
Technical Advisers	<ul style="list-style-type: none"> • Geotechnical principles • Design principles including structural, geotechnical, hydrologic and hydraulic • Construction techniques • Operation and maintenance procedures • Surveillance processes • Response to dam safety issues • Emergency planning • Emergency response
Operations and Maintenance Personnel *	<ul style="list-style-type: none"> • Safe operations procedures • Maintenance practices • Surveillance principles, particularly monitoring • Emergency planning • Need for vigilance
Technical Advisor, Dams Field Personnel *	<ul style="list-style-type: none"> • Awareness of visual signs of dam safety deficiencies • Procedures for operating mechanical items • Emergency response including alerting others • Surveillance principles, particularly monitoring • Need for vigilance
Key Emergency Personnel*/ Defence Civil	<ul style="list-style-type: none"> • Awareness of the potential impact • Emergency planning and response
Territorial Authorities/Regional Councils	<ul style="list-style-type: none"> • Awareness of planning, Resource and Building Consent implications
Public at Risk	<ul style="list-style-type: none"> • Emergency awareness and response • Awareness of the potential impact

E.3 Scope and Structure of Manual

The manual describing procedures for operations, maintenance and surveillance, is a vital document and is customarily referred to just as the "Operations (or Operating) and Maintenance" Manual or O & M Manual. The latter abbreviation will be adopted for the following discussion.

The scope of the O & M Manual will vary for each situation but a general scope can be outlined. Table E.2 which follows, sets out main contents which should be included in the manual from the dam safety perspective. Further detail on key aspects is contained in subsequent sections.

It is also important to note that the O & M Manual must be easy to understand and user-friendly for those who are to implement it on a routine basis, whether the medium is printed text, via computer software, or both. There is a risk otherwise that important aspects will be overlooked because of human reaction to complex instructions. It is recommended that basic instructions and forms be as brief and simple as possible, with background information and detail in well referenced appendices.

Table E.2.
O & M Manual Contents from Dam Safety Perspective.

ASPECT	NOTES
INTRODUCTION	<ul style="list-style-type: none"> • Sets out scope and objectives
DAM STRUCTURE AND PURPOSE	<ul style="list-style-type: none"> • Describes what the dam is and does referring to other documents as appropriate (e.g. Design and safety Evaluation reports, consent conditions etc.)
APPURTENANT STRUCTURES	<ul style="list-style-type: none"> • Describes the function of appurtenant structures, such as spillway, intake, penstocks, powerhouse etc. references to other documents as appropriate (e.g. Design and safety Evaluation reports, consent conditions etc.)
KEY ASPECTS RELATING TO SAFETY	<ul style="list-style-type: none"> • Sets out the particular aspects of importance on this particular dam related to reservoir safety. This includes not only those aspects relating directly to the dam (such as structural, geological and dam safety parameters) but also features of the appurtenant structures (such as gates, valves, electrical controls and communication systems). Part I includes the Health and safety Act requirements.
MANAGEMENT STRUCTURE AND PERSONNEL	<ul style="list-style-type: none"> • Describes how the dam is run and its appurtenant structures is run and who is responsible for what.
OPERATIONS AND MAINTENANCE REQUIREMENTS	<ul style="list-style-type: none"> • Describes how the dam and its appurtenant structures is to be operated and what is to be maintained and to what standards to maintain functional safety
LEGISLATIVE REQUIREMENTS	<ul style="list-style-type: none"> • Describes the procedures to be followed to meet operational and safety legislative requirements. This covers water use consent conditions, (under RMA), warrant of fitness, including compliance schedule, (under Building Act) and health and safety (under Health & Safety in Employment Act) issues.
SURVEILLANCE AND EVALUATION	<ul style="list-style-type: none"> • Sets out surveillance items, frequency, reporting requirements, acceptable limits for values measured and how data is to be evaluated and reacted to (including unusual events)
PLANT AND EQUIPMENT	<ul style="list-style-type: none"> • Details the maintenance and testing procedures and frequencies and documentation to meet the requirements of the building warrant of fitness under the Building Act.
EMERGENCY ACTION PLAN	<ul style="list-style-type: none"> • Sets out the plan and procedures to follow in the

	event of an emergency <ul style="list-style-type: none"> • Can be a stand alone document
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E.4 Maintenance and Surveillance - Scope and Frequency

E.4.1 Operation

Features and equipment for the passage of water through the dam and its appurtenant structures must carry out their normal functions without leading to the uncontrolled release of the reservoir water. Uncontrolled release of the reservoir is interpreted as an event during which there is no control over the quantity of water and its rate of discharge from the reservoir.

It should be noted that in general the failure of a turbine or a penstock for example will not result in the uncontrolled release of reservoir water as the quantity and the size of the opening and the capacity of the inlet control rate of discharge. The Building Code covers the design and performance of these features. Normal operating circumstances, which may result in the uncontrolled release of reservoir water, include where discharge is likely to cause erosion, which puts the safety of the dam and therefore the reservoir in jeopardy. In this case procedures should be in place to meet the general requirements of these guidelines.

E.4.2 Maintenance

Maintenance can be separated into four areas:

- mechanical equipment impacting on operational safety (gates, pipelines, valves)
- electrical equipment to operate the same mechanical equipment or which telemeters data used in safety management or forms part of the emergency communications systems.
- the dam and its appurtenant structures
- the reservoir and its margins

Mechanical and electrical equipment require appropriate maintenance and testing. The aim of the testing programme is to demonstrate the equipment is in good working order and is capable of normal and emergency operation. In addition it is necessary for operators to be familiar with the performance of this equipment, especially if it otherwise infrequently used and if modifications or repairs have been carried out. During testing any associated issues of environmental concerns, and legal consents will have to be addressed by appropriate planning and consent processes.

The standard of maintenance and frequency and type of test will be according to the equipment function in terms of dam safety and normal operations. The Owner will decide his maintenance and testing regime for equipment controlling normal operations using usual commercial criteria. A typical testing programme for gates and valves involved in dam safety of medium and high potential impact dams is provided in Table E.3.

Table E.3.
Guideline Gate/Valve Testing Schedules.

GATE/VALVE FUNCTION	UNBALANCED HEAD TEST	BALANCED TEST	BACK-UP POWER SUPPLY TEST
Passage of floods	Annually 15% minimum opening. Initiated by back-up power supply	Six yearly. Full range. Initiated by back-up power supply	Monthly. Battery & motor start-up checks. 150mm min. opening

Reservoir evacuation only	Six yearly. 15% min. opening. Initiated by back-up power supply	Six yearly. Full range (in dry). Initiated by back-up power supply	Monthly Battery & motor stat-up checks. Nil gate opening
Machine intake	Six yearly.	Annually	N/A
Bulkheads and stoplogs	Twelve Yearly	N/A	N/A

Back-up power supply tests also form part of the gate tests. They concentrate on confirming satisfactory field operation. Control room function tests should also be checked for satisfactory performance. These include the testing of local operation, remote operation, automatic operation, over velocity tripping of intake gates and automatic re-pumping to counter gate drift. Gate hoisting ropes should be visually inspected annually, for defects such as broken strands, corrosion, deformation and loss of lubricant. Specifically selected ropes, representative of each gate installation, shall receive a six yearly non-destructive test.

Communications equipment should be tested and maintained as part of the exercising of Emergency Action Plans.

Typical aspects addressed under routine maintenance and assurance of functionality, include:

- undertaking regular system checks
- operating equipment deliberately if it has not operated frequently in service
- lubricating moving parts and keeping oil levels topped up
- controlling or repairing corrosion
- repairing and replacing worn or damaged equipment
- operating ancillary equipment such as standby generators and ensuring batteries are charged and suitable fuel is always available

Maintenance of dam components and the reservoir, will generally be on an as-needs basis. Any specific issues will be included in the compliance schedule. Routine items which are commonly addressed as part of operational safety include:

- clearing dead timber from the reservoir margins and the dam face which might block spillways and dealing with weed islands if there is a likelihood of these impairing the spillway function
- repairing rip rap damage or surface erosion on the dam face
- keeping surface drains, and drainage systems generally, in good condition
- draining seeps and arresting or repairing significant reservoir slumps and slides
- ensuring that trees and like growth do not establish on the dam or designated abutment areas to prevent root penetration and obscuring of seepages and slumps
- repairing cracks and erosion damage in spillway concrete

E.5 Surveillance - Scope and Frequency

The following text refers to routine surveillance carried out by the Owner or the Owner's Operators, and excludes external inspections (refer E6). It is this routine inspection and surveillance and its evaluation which is of greatest importance, as it can detect potential problems early and enable them to be dealt with more safely and cost effectively, giving the dam owner the opportunity to remedy, alleviate, or mitigate the problem. External inspections and major safety reviews are usually too infrequent to enable early detection. Refer to E7 and Appendix G.

The total surveillance requirements have provision for:

- regular surveillance (ongoing)
- intermediate inspections (annual)
- five-yearly reviews, or following an unusual event

Apart from evaluating the data and responding to it, as discussed in the next section, it is important that the data be logged systematically and in a form which makes it easy to utilise and record permanently. If the recording is not systematic, trends may be disguised and data may be difficult to interpret reliably.

Graphical presentation is important. The perception of significant trends or changes may be obscured by a mass of records of benign conditions. Monitoring schedules should be reviewed periodically (at least at Safety Reviews) to reduce them to essentials.

There is a need for quality assurance procedures with acceptable standards for the maintenance of instrument accuracy and measurement accuracy in data interpretation.

Tables E.4 and E.5 provide a list of typical inspection and surveillance items and indicative measurement frequencies for Medium and High Potential Impact dams. Designers or Technical Advisers will set actual requirements to suit the particular dam, in accordance with the compliance requirements.

E.6 Data Evaluation and Reactions

Surveillance will not serve its purpose unless the data gathered is evaluated against some acceptable criteria, warning signs are recognised promptly, and appropriate action is taken. In specific cases some may be detailed in the Compliance Schedule. In general for high and medium impact potential dams and their appurtenant structures the data is to be reviewed monthly for the determination of trends and detection of anomalies. There must be an adequate system for evaluation and action. Should a dam safety issue arise the Owner is likely to be required to demonstrate that all possible steps were taken in the analysis and response to the collected surveillance data.

Apart from reacting appropriately to visual signs, either on a common-sense basis or as more specifically laid out in the O & M Manual, the Manual should set maximum values (usually incorporating a margin of safety) for key parameters measured (such as seepages, uplift pressures, and pore pressures). The Manual should require the observer to compare the value measured against the limits set, and then state how to react if the value is exceeded. In some cases, the Manual may require some immediate preventative action such as lowering the reservoir, but generally there will be a referral system to the Technical Advisors nominated in the Manual as having responsibility for evaluation and advice.

E.7 Unusual Events

Surveillance and evaluation of performance should also be carried out following unusual events which may lead to emergencies and special procedures as covered under Emergency Action Plans. In the normal course of operations, unusual events should be evaluated to determine whether there has been any damage requiring correction, special safety measures needing to be implemented, and to assess behaviour compared with design.

Unusual events customarily anticipated in surveillance schedules, include:

- large rainfalls or floods
- earthquakes
- landslides into the reservoir
- windstorms
- volcanic eruption

E.8 Intermediate Inspections

Dam safety inspections are required to verify throughout the operating life of the structure the structural integrity of the dam and appurtenant structures, assuring protection of human life and property. Inspection types and frequencies are developed to suit particular cases and may be varied according to conditions. In general these inspections are conducted annually and in the case of medium and high impact structures, carried out by someone outside the owner's staff. For low impact structures the owner may conduct them. Each inspection must be reported. Verification that

Table E.4.
Guideline Surveillance Schedules. (A) Inspection Guidelines.

FEATURE	INSPECT FOR:												
	Alignment	Animal Burrows	Cracks	Debris	Deterioration	Erosion	Human Activity	Leakage	Muddy Water	Seepage	Settlement & Creeps	Vegetation	Weathering
EMBANKMENT DAMS													
Upstream Slope	M	M	M			M	M				A	A	
Downstream Slope	M	M	M			M	M	W	W	M	A	A	
Abutments		M	M					W		M	A	A	
Crest	M	M				A					A	A	
Seepage Areas								W	W	M			
Internal Drainage					A			W	W				
Relief Drains	M			M		A		W	W				
CONCRETE DAMS													
Upstream Face			M		A						A		A
Downstream Face			M		A			W		M	A		A
Abutments			M		A			W		M	A	A	A
Crests	M		M		A						A		A
SPILLWAYS													
Approach Channel				W									
Stilling Basin							M						
Discharge Channel				W	A						A	A	
Control Features				W	A								
Erosion Protection							M				M		
Side Slopes			M			M		M			A	A	

INLETS, OUTLETS AND DRAINS													
Inlet & Outlets	M			W	A			M					A
Stilling Basin	M		M	W	A								
Discharge Channel			M	W									A
Trashracks				W									A
Emergency Systems					A		M						
GENERAL AREAS													
Reservoir Surface								A					
Shoreline											A	A	
Mechanical Systems					A								
Electrical Systems					A								
Upstream Systems							A						
Downstream Floodplains							A						

Lists features to be inspected at a dam and the problems or deficiencies to be looked for

W = Weekly, M = Monthly, A = Annually

the inspection has been carried out and the report produced is part of the building warrant of fitness. Unless specifically required by the regional Authority the report is kept by the Owner but must be produced upon request.

The inspection report describes observations and interpretations and gives recommendations. The focus of the report is on matters relating to dam safety and actions required to be taken by the Owner to assure legal requirements are met. The Owner may take the opportunity to include in the report matters relating to asset management and health and safety. To accommodate

Table E.5.
Guideline Surveillance Schedule. (B) Instrumentation and Monitoring Guidelines.

FEATURE	INSPECT FOR:										
	Visual Observation	Movements	Uplift & Pore Pressure	Water Levels & Flow	Seepage Flows	Water Quality	Temp Meas	Crack & Joint Meas	Seismic Meas	Stress-Strain Meas	
EMBANKMENT DAMS											
Upstream Slope	M	A	M	C					C		
Downstream Slope	M	A	M		W	A		A	C		
Left/Right Abutments	M	A	M		W	A			C		
Crest	M	A	M					A	C		
Internal Drainage System			M		W	A					
Relief Drains	M		M		W						
Reprap & Slope Protection	M										

Tailings dam drainage						C				
CONCRETE DAMS										
Upstream Face	M	A		C			M	A	C	A
Downstream Face	M	A	M				M	A	C	A
Left/Right Abutments	M	A	M		W				C	A
Crests	M	A	M				M	A	C	A
Internal Drainage System			M		W			A		
Relief Drains	M		M		W					
Galleries	M	A						A	C	A
Sluiceways/Controls	M			C						
SPILLWAYS										
Approach Channel	M	A		C						
Inlet/Outlet Structure	M	A	M	D	W					
Stilling Basin	M			D				A	C	
Discharge conduit/Channel	M		M	D				A		
Control Features	M									
Erosion Protection	M									
Side Slopes	M	A	M							
OUTLETS & DRAINS										
Inlet & Outlets	M	A	M	W				A	C	
Stilling Basin	M									
Discharge Channel	M	A	M	W				A		
Trashrack/Debris Control	M									
Emergency Systems	M									
GENERAL AREAS										
Reservoir Surface	M					W				
Mech/Elect Systems	M			W						
Shoreline	A					A				
Upstream Watershed	A					A				
Downstream Floodplains	A				M	A				
Lists features to be observed at a dam and the suggested instruments or observation Techniques to be used.										

W = Weekly, M = Monthly, A = Annually

recommendations, which are not essential to safety, a procedure sometimes adopted is to categorise recommendations into:

- urgent
- necessary
- desirable
- optional

or similar.

Inspections should be systematically organised so that the status of all critical aspects of the dam can be accurately recorded and evaluated. Field inspection checklists should be assembled as a

part of the operation, maintenance and surveillance procedures. Reference to previous inspection reports should be made during or prior to the inspection. Generally, the intermediate inspection reports should include:

- observations during the inspection
- what has occurred since the previous inspection e.g. incidents, action arising from previous recommendations
- a review of monitored data and other information
- an evaluation and interpretation of the structural performance of the dam and related structures/equipment including a comparison of the conditions with those of the previous inspection
- appropriate photographs
- recommendations and action list

Dam safety inspections for low potential Impact structures should include:

- observations during the inspection;
- what has occurred since the previous inspection, e.g. incidents, action arising from previous recommendation;
- appropriate photographs; and
- recommendations and action list.

APPENDIX F

EMERGENCY ACTION PLAN

F.1 Requirement for an Emergency Action Plan (EAP)

An Emergency Action Plan (EAP) is integral with the Operations and Surveillance procedures, considers all the potential hazards, and puts in place actions to isolate, prevent, protect life, or, mitigate losses.

An Emergency Action Plan should also be prepared prior to the construction of Medium and High Potential Impact earth dams. The documentation should also be prepared for similar category concrete dams if there is a potential for abutment erosion as a result of overtopping during construction of a concrete dam. The documentation will assist in identifying how to handle flood volumes and peak discharges during construction.

Situations which could give rise to an emergency include:

- Volcanic eruption (lava flow, ash, etc.)
- Major earthquake
- Major flood
- Major landslide into the reservoir, or from abutments
- Inadequate spillway (or diversion in the case of a dam under construction)
- Spillway blockage or inoperable gates
- Dam structure progressively failing due to seepage forces or piping
- Accidental damage
- Sabotage

An EAP should exist for all High and Medium Potential Impact Dams.

The hazard and risks will vary depending on the status of the dam and the plan requirements will vary accordingly. Legislation requires emergency action plans for the following stages of the life of a dam:

- Construction above medium impact level
- Commissioning
- Operation
- Alteration or decommissioning

F.2 Development of an Emergency Action Plan

An EAP should describe the actions to be taken by the dam owner and operators (or contractors when a dam is under construction) and relevant agencies in an emergency. The EAP should assign responsibility for each action to an individual and/or backup. The dam owner is responsible for co-ordination of input to the EAP from other agencies and affected parties

The steps in developing an EAP are generally as follows:

- Identification of those situations or events that would require initiation of an emergency action. Identification of the performance or surveillance indicators which will lead to an emergency being initiated.
- F-2 Appendix F - Emergency Action Plan
- Specification of the actions to be taken, and by whom.
- Identification of all sources, agencies, and individuals who are able to supply information for input into the EAP.
- Identification of all jurisdictions, agencies, and individuals who will be involved in implementing the EAP.
- Identification of primary and auxiliary communications systems, both internal (between persons at the dam) and external between dam personnel and external agencies).
- Identification all persons and agencies involved in the notification process, and draft a notification flow chart. Include who should be notified, in what order, and what other actions are expected of downstream agencies.
- Assess if each territorial, Regional and Central Government agency involved and having its own general emergency plan requires amendments to their plan to include actions required as a result of a dam emergency.
- Develop a draft EAP.
- Discuss fully with all the parties included on the notification list, seeking review and comment.
- Make any revisions, obtain any necessary regulatory approval, and circulate the EAP to those who have responsibilities under the plan.

F.3 Contents of an Emergency Action Plan

The EAP should include the following procedures and information

- Purpose of the Emergency Action Plan
- Responsibilities
- Emergency identification and evaluation
- Preventative actions (where available)
- Notification procedure
- Notification flow chart
- Communication systems
- Access to site
- Response during periods of darkness
- Response during periods of adverse weather
- Sources of equipment
- Stockpiling supplies and material
- Emergency power sources
- Inundation maps
- Warning systems (if used)

Purpose of the Emergency Action Plan

The Plan is designed to limit damage to the dam and areas downstream, and prevent loss of life. It should take into account conceivable failure scenarios applicable to the dam, the potential downstream consequences, and what realistically may be achieved to safe guard lives at risk and generally minimise damage.

The outcomes are:

- The identification of emergency conditions which could endanger the integrity of the dam and which require immediate action.
- Prescription of procedures which should be followed by the dam owner and operating personnel to initiate emergency procedures at the dam.
- Provides timely warning to appropriate emergency management agencies for their implementation of protection measures for downstream communities.
-

Responsibilities

This section should specify the person(s) or organisation(s) responsible for the surveillance, maintenance and operation of the dam and the person(s) and or agencies responsible for implementing various stages of the EAP.

Emergency Identification and Evaluation

If detected early enough, potential emergencies can be evaluated and preventative or remedial actions taken. The EAP should contain clear procedures for taking action when a potential emergency is identified. Notification of emergency situations requires that a responsible contact person initiates the remedial action and decide if and when an emergency should be declared and the EAP executed. Clear guidance should be provided in the EAP on the conditions which require that an emergency be declared.

Once an emergency situation has been identified and evaluated, it should be classified as to its urgency so that the appropriate action can be taken.

Preventative Action

This section should detail preventative actions, taken both prior to and following the development of emergency situations, to prepare for any emergency. It should detail provisions for surveillance and detection of an emergency situation and should clearly indicate what can be implemented in a timely manner. An important factor in the effectiveness of the Emergency Action Plan is the prompt detection and evaluation of information obtained from instrumentation and/or physical inspection and surveillance procedures.

The time factor from the onset of an emergency to awareness of imminent damage and its effect on the workability of the EAP should be detailed. Timely implementation of the EPA is a crucial element in its effectiveness and appropriate effective warning systems are imperative for downstream emergency authorities to minimise loss of life and property damage.

The following factors should be outlined in this section of the EAP:

- Surveillance, Monitoring and Warning Systems
- Alert and alarm levels for surveillance and monitoring systems
- Adverse Time Response
- The nature of the material that may potentially be released in a failure
- Alternative Source of Power and Communication
- Emergency Supplies and Resources
- Co-ordinating Information (e.g. weather forecasts, stream flow)

- Actions to lower the reservoir or limit inflows and outflows
- Actions to remedy, alleviate or mitigate the potential impact
-

Notification Procedures

Notification procedures must be clear and easy to follow. The EAP should set out a list of all persons to be notified in the event that an emergency is declared, and their order of priority.

For each type of emergency situation, the EAP should clearly indicate who is to make a call, to whom it is to be made, and in what priority.

Early notification to the N.Z. Police allows them to prepare for a mobilisation of forces before the emergency is declared. They can then determine if they have sufficient resources, or will need to call in the Civil Defence

The number of persons to be notified by each responsible individual should be kept to a minimum, and briefing of the news-media should be pre-planned to the greatest possible extent.

Notification Flow Chart

A notification flow chart is a diagram showing the hierarchy of notification during an emergency. It is a pictorial representation of the notification procedure. The EAP should contain a notification flow chart clearly summarising the notification procedure for each of the emergency conditions considered. Included are: N.Z. Police, Civil Defence, Owner, Contractors, Technical advisers, Territorial Local Authorities and media. The flow chart should include individual names and position titles, office and home telephone numbers, with alternative contacts and means of communication.

Copies to be available to all individuals having responsibilities under the plan, and prominently posted at the dam, and local emergency operations centre.

Communications Systems

Full details of the internal and external communications systems as they apply to the EAP should be included.

Access to the Site

The description of access should focus on primary and secondary routes and means for reaching the site under various conditions (e.g. foot, boat, helicopter, bulldozer), and the expected response (travel) time.

Response during Periods of Darkness

The EAP should cover the response to potential or actual emergency conditions during periods of darkness including those caused by power failures.

Response during Periods of Adverse Weather

The EAP should address emergency response under adverse weather conditions including extremes of cold, snow, or storms.

Sources of Equipment

The location and availability of equipment and contractors that could be mobilised in case of an emergency should be included.

Stockpiling Supplies and Materials

The location and availability of stockpiled materials and equipment for emergency use should be addressed.

Emergency Power Sources

Details on the location and operation of emergency power sources should be included.

Inundation Maps

Inundation maps are needed for District Planning, Resource Consent Management, N.Z. Police, Civil Defence and Territorial Local Authorities to develop management and evacuation plans. Flood hazard maps may already exist for the affected flood plains. Where the EAP scenario gives a flood peak < 2% probability event (1 in 50 year return period), then the existing flood hazard maps may suffice. They should be prepared wherever communities or significant numbers of dwellings are located in the flood plain. These maps will outline the area inundated in sufficient detail to locate dwellings, services and other significant features. Indication of flood wave travel times will be noted on the maps.

Warning Systems

Warning systems are sometimes used to provide warnings to residents, camp grounds, and parks that are close to the dam. Full details should be contained in the E A P and cover N.Z. Police, Civil Defence, Territorial Local Authority, Own Company, Contractor, and media.

Appendices

Additional items may be covered in the appendices to the EAP:

- General site plans may be useful
- Drawings showing the potential breach location used in the inundation study
- Tables showing the variation in flood stage with time at key locations in the flooded area
- Recording of Emergency situations
- EAP training and Review

F.4 Maintenance and Testing of an Emergency Action Plan

The dam owner is responsible for issuing the EAP to those affected, as well as for maintaining and updating all registered copies of the EAP.

The dam owner should test the EAP.

As updates or amendments are produced, they should be forwarded to each holder (as listed in the EAP) and acknowledged by the recipient. Telephone numbers and names of contact persons should be updated on a regular basis, at least annually. It is helpful to place the EAP in a loose-leaf binder so that outdated pages can be easily removed and replaced with updated information, to ensure a complete, current and workable plan. A list of plan holders should appear in the EAP.

Testing is an integral part of the EAP to ensure that both the document and the training of involved parties are adequate. Tests can range from a limited table top exercise to a full scale simulation of an emergency and can include multiple failures (domino effect).

F.5 Training

The dam owner should provide training to ensure that dam personnel involved in the EAP are thoroughly familiar with all elements of the EAP, the availability of equipment, and their responsibilities and duties.

This familiarity should be extended to appropriate members of the N.Z. Police, and Civil Defence Officers.

Technically qualified personnel should be trained in problem detection and evaluation and appropriate remedial (emergency and non-emergency) measures.

This training is essential for proper evaluation of developing situations at all levels of responsibility which, initially, is usually based on observations on-site. A sufficient number of people should be trained to ensure adequate coverage at all times. Simulated exercises may prove useful in this training.

F.6 Inundation Studies

An inundation study should be carried out for all dams that clearly require EAP's, and for dams where it is not obvious whether or not an EAP is needed, or where the consequence of classification of dam is in doubt.

The inundation study should be based on assumptions that will indicate all areas that could be flooded for the most severe combination of reasonably possible conditions.

Various dam failure scenarios are normally studied; these cover rapid failure times, large breach sizes and conservative antecedent conditions. The potentially inundated area should be determined and the following conditions considered:

- Fair weather dam failure (piping, earthquake, volcano) at full supply level.
- Design flood with and without failure.
- Inundation maps showing the flooded areas should be prepared. A number of computer programmes are available which can be used successfully to provide the analysis.

Regional Councils have a responsibility for regional scale natural hazard information including flood hazard maps. Where an impact of failure is similar to flood sizes already mapped then existing information may suffice,

Key Emergency People

An easy to find section provided for key emergency contacts

Inspection

A special dam inspection together with appropriate monitoring needs to be carried out as quickly as possible with ongoing surveillance until the emergency is over. A schedule of appropriate inspectors for the dam should be attached as an appendice.

F.7 Risk Assessment

A risk assessment will assist in the development of the consequences of potential hazards associated with the structures, and the likelihood of their occurrence. The risk assessment will assist in the selection of options to remedy, alleviate or mitigate potential impacts as a result of a structural failure of a structure retaining a body of material. The production of a fault tree and an event tree is helpful in representing the effects of various hazards.

APPENDIX G - SAFETY REVIEWS

G.1 Introduction

This Appendix provides expanded guidelines for safety reviews. Almost by definition, safety reviews are applicable to dams with Medium or High Potential Impact, and the recommendations are more applicable to such dams. However, Low Potential Impact dams may warrant assessment to preserve the asset value or earning potential of the dam and require periodic review to assess whether their hazard may have moved into a higher category.

The Appendix focuses on key points but does not cover all details. Reference should be made to other documents as appropriate, using for example the reference list at the end of these Guidelines.

G.2 Personnel

The following lists the key personnel involved, outlines their roles or responsibilities and recommends

basic skill or experience requirements:

- Owner - Whether or not safety reviews are statutorily required (by consent conditions), the Owner must take steps to understand the requirements for safety reviews, plan and budget for their implementation and ensure that they take place. After taking advice as necessary, the Owner must draw up the brief, in accordance with the Compliance Schedule requirements facilitate the review, and most importantly, act on recommendations considered necessary to secure an appropriate level of public safety, avoidance of damage to other property, and protection of environmental security.
- Statutory - Under “warrant of fitness” conditions, Regional Councils will have a responsibility to confirm that safety reviews have been undertaken to satisfactory standards, then ensure that recommendations essential to safety are implemented
- Operators - On behalf of the Owner, Operators will be responsible for providing all available data and relevant information to the Safety Review Team, facilitating inspections including Health and Safety aspects, operating equipment as necessary, and responding fully and frankly to any questions put to them.
- Safety Review - The Technical Specialists making up the Team will carry out the review and report in accordance with the Owner’s brief, Compliance Schedule requirements, and to the highest standards of professional practice. Each specialist must be suitably experienced and senior in the area to be covered, and while “grey hairs” are of considerable value, it is important that each person is technologically up to date because a fundamental part of safety reviews is to assess the dam in the light of current technology. For more complex dams involving several facets, it may be necessary or advisable to involve more than one engineer to ensure adequate coverage of issues. There may also be a need for closely defined specialist inputs in areas such as seismology and earthquake risk. Owners and Regulators need to

appreciate that if the Team is not suitably qualified, the review may not disclose important issues. Members of the original design team may assist by clarifying matters, but should not be included in the Safety Review Team to ensure that an independent and unprotective evaluation is made.

- Peer Reviewers - While a safety review is a form of peer review, some organisations require peer review of the Safety Review Team's work. This applies particularly in the first round where there is a lack of original data. The need for such a review depends on circumstances and affordability, but such peer review is recognised as a sound concept. The Peer Reviewer (or reviewers) in this case needs to have suitably wide experience at least equal to that of the Team and generally will be drawn from the most senior practitioners available.

G.3 Scope of Review and Related Issues

G.3.1 General

The main text summarises the key areas typically considered in a review. Setting aside the difficulties which arise in an "initial" review as discussed in G3.2, the following outlines a more detailed typical scope and related issues:

- fundamentals
 - assessment of hazards and risk taking into account any existing or proposed catchment changes upstream or downstream
 - appraisal of general design standards against modern practice, involving site specific assessment of seismotectonics, flood risk and volcanic risk
 - assessment of the site condition of the existing structures
 - evaluation of design data and construction methods
- hydrology and
 - appropriateness of design flood(s) spillway provisions - ability to pass design flood(s)
 - spillway performance characteristics, risks of blockage or malfunction, and stability
 - acceptability of freeboard
 - consequences of no change to spillway
- structural aspects-
 - appropriateness of dam design details for loadings and seepage conditions taking foundation features and performance data into account
 - performance under design earthquake(s) and flood(s)
 - structural integrity of ancillary structures impacting on safety under all design loading conditions
- equipment
 - structural adequacy
 - functionality and security of operation
 - reliability
- reservoir
 - slide potential
 - seiche risk

- downstream - environmental changes affecting potential impact classification
- river bed changes affecting structural or spillway performance
- operational, - compliance with essential aspects of Appendix E guidemaintenance and lines and implementation of any previous safety review surveillance aspects recommendations
- reporting - see G.4
- emergency - prescribe procedures in an emergency planpreparedness - assign responsibility
- identify all parties involved
- identify cause, effect, and mitigation
- locate resources

The Safety Review Team will assess a finer level of detail within these areas.

As a matter of good practice, and to help achieve effective communication or understanding, it is recommended that the Owner or an appointed representative take part in the inspection, and/or that meetings be held during the course of the evaluation, or after supply of a draft review report.

Care is required in setting up the contractual relationship between the owner and the safety reviewer, to ensure the review is complete, and the report is without bias from the Owner, or manager of the facility. In appropriate or draconian liability provisions may unduly influence the judgment and candor of the reviewers to the extent that they may only take an ultra conservative approach and recommend unnecessary additional studies and investigation to cover the slightest uncertainties.

The brief needs to clearly separate the annual performance compliance from other asset management aspects the owner may wish examined.

G.3.2 Initial Reviews

This term applies to old or existing dams reviewed for the first time, which frequently have limited data available on their development history and may also have limited operational records. The key problem with such dams is the lack of data and “where to start”.

In principle, the first step should be to try to establish a data book (or books) which provide the best available knowledge of the dam. The extent to which the Owner does this as a prelude to the review or as part of it, is a matter of choice and circumstances.

An almost inevitable consequence of initial reviews, unless the situation is very straightforward, is that they will involve at least two stages. The first stage will be aimed at putting issues in perspective as can best be judged on available information, and determining areas of uncertainty for further examination. It may be that a potential safety deficiency is identified straight away, in which case appropriate action must be taken. The second stage will often require forensic investigation and monitoring to assess areas of uncertainty. In such cases a realistic lead time to the “Warrant of Fitness” date will be required.

It is important that Owners appreciate the probable need for forensic investigation and its associated cost, and that Consent Authorities appreciate that it may take some time to arrive at realistic conclusions in the case of initial reviews. . Notices to Rectify should reflect the practicality of achieving compliance from a time and cost basis balanced with risk exposure.

G.3.3 Low Potential Impact Dams

Brief and generalised recommendations are outlined in the main text for Low Potential Impact dams. Legislation may not require a “warrant of fitness” for a Low Potential Impact dam, but it is not in the Owner’s interests or society’s interests, to ignore dam safety on the basis of the Potential

Impact being low. Furthermore, environmental changes may cause a Low Potential Impact dam to be rated in the Medium Potential Impact classification. These Guidelines deal with issues of dam safety. For all classifications of dam, the owner will need to take particular precautionary measures to protect commercial and public relations interests.

There are many dams with a low risk to life or property, notably for community water supply or hydro generation, where the consequences of failure would have serious social or economic effects. Thorough safety reviews of these dams are definitely in the Owner’s interests and may well be required to maintain insurability. In such cases an appropriately scoped safety review should be undertaken, based on the foregoing and following advice. These dams are Medium Impact Dams by definition.

G.4 Review Conclusions and Reporting

The extent and standard of reporting should be such as to:

- confirm that the brief has been met fully or exceeded
- comprehensively describe the inspections, findings, forensic work, and related inferences or conclusions
- be easily understood by the Owner and subsequent Reviewers
- present conclusions and recommendations clearly
- confirm compliance requirements have been met and / or what is required to fulfil compliance.

Key conclusions and recommendations which require the most careful consideration are:

- the assessed condition of the dam and appurtenant structures to function satisfactorily in a safe manner according to recognised criteria
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- determination of the most plausible modes of failure for the dam, or its appurtenant structures, and their potential dam safety impact
- an assessment of the dam's performance with respect to these potential modes of failure
- assessment of the Operations and Maintenance procedures (or equivalent documentation) for dam safety application
- areas of uncertainty requiring further assessment
- any areas requiring immediate action with accompanying advice
- prioritisation of recommended actions
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G.5 Follow-up Action by Owner

The responsibility for acting on the recommendations of the safety review rests with the Owner. The Consent Authority will provide a level of external control and overview. The Owner should take advice as necessary on how best to implement the recommendations. Where the cost implications are high, it may be in the Owner's interests to undertake a higher level of investigation and review before implementing the full detail of recommended works. It may not be necessary to undertake significant works, where an acceptable level of reduction in the potential impact of the

issue can be brought about by softer options, such as increased surveillance, and improved emergency preparedness procedures. Where a high level of risk is perceived to apply while matters are being investigated or designed, the Owner should implement such reasonable temporary measures as can be effected to improve the situation after discussion with the Consent Authority (e.g. increasing the frequency of surveillance, lowering the water level or providing temporary auxiliary spillway capacity).

The Consent Authority may issue a Notice to Rectify. Such notice may be to decommission the dam. This would require consents to be sought under the Resource Management Act.