

REPORT

Assessment of Environmental Effects for Additional Bywashes

Prepared for

Central Plains Water Trust

c/o GHD Limited
BDO Spicers, Level 4, 148 Victoria Street
Christchurch

4 October 2006

42156547/AEE FOR ADDITIONAL BYWASHES

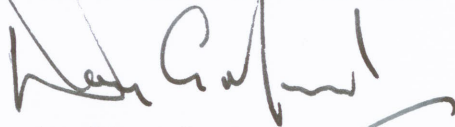
**APPLICATION FOR RESOURCE CONSENT UNDER SECTION 88 OF THE
RESOURCE MANAGEMENT ACT 1991**

To: Environment Canterbury

1. Central Plains Water Trust applies for the following type of resource consent:
A discharge permit to discharge water and contaminants from the water distribution network to land and water in the locations listed below
2. The names and addresses of the owner and occupier (other than the applicant) of land to which the application relates are as follows:
Crown (riverbed)
3. The locations of the proposed activity are as follows (see also Assessment of Environmental Effects, section 2.1):
Site 1: Selwyn River Bywash: Race C 3.1 will discharge to a wetland and to the Selwyn River 3.5 km east from Hororata at about map reference NZMS 260 L35: 289-421
Site 2: Hawkins River Bywash: Race SP 2.5 will discharge to a wetland and to the Hawkins River 2 km upstream from Sheffield at about map reference NZMS 260 L35: 281-574
4. The following additional resource consents are required in relation to this proposal and have been applied for:
Other applications were lodged with Environment Canterbury in December 2001, November 2005 and September 2006, and with Selwyn District Council in June 2006.
5. In accordance with the Fourth Schedule of the Resource Management Act 1991, attached is an assessment of environmental effects in the detail that corresponds with the scale and significance of the effects that the proposed activity may have on the environment.
6. There is no further information required to be attached to the application by the district plan, the regional plan, the Resource Management Act 1991, or any regulations made under that Act.

DATED this 20th day of December 2006

SIGNED on behalf of Central Plains Water Trust



Address for service of the applicant::

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Executive Summary

The Central Plains Water Trust is applying for permits for normal operational bywash discharges and emergency peak flow discharges at two locations in addition to those in the main group of applications of November 2005. These new applications are required as a consequence of changes in scheme layout since the earlier application, and result from consultation with landowners.

The points concerned are on the Selwyn River 4 km east of Hororata, and on the Hawkins River 2 km upstream from Sheffield.

Under normal operations it is necessary to discharge small volumes of surplus water at the end of the network branches to maintain flow past the last farmer taking scheme water on each race. This bywash will be minimised and will be discharged through ground soakage via constructed wetlands. The operational bywash flows proposed are up to 0.4 m³/s and 0.3 m³/s into the Selwyn and Hawkins Rivers respectively. Discharge via wetlands is the method preferred by tangata whenua and other parties.

Regarding the applications for emergency conditions there could be rare and brief times when the full intake flow may have to be discharged. This could occur when there is a district-wide power cut when the canals were carrying full flow capacity. Peak flows in an emergency could discharge up to 3 m³/s to the Selwyn and up to 2.5 m³/s to the Hawkins. These flows are for an extreme case that might never occur in the life of the scheme and, if it did, it would last for only a few hours. It is proposed to discharge these flows directly to the two rivers, i.e. not through wetlands.

It is considered that the environmental effects of these new applications will be minimal, as for the bywashes applied for in November 2005.

However a range of mitigations is proposed in keeping with those indicated for the whole scheme. These cover both construction and operational phases.

Section 1

Introduction

1.1 Introduction

This application is for two operational bywash discharges and emergency peak flow discharges in addition to those listed in the Central Plains Water Enhancement Scheme: Assessment of Environmental Effects for Resource Consent Applications to Canterbury Regional Council, June 2006.

The purpose of this report is to assess the environmental effects of the proposed activity and explain what changes there will be within the environment as a result of these activities. The scale and significance of these effects are reflected in the level of detail provided in this report. Measures to avoid, remedy or mitigate any potentially adverse effects of the scheme construction and operation are also indicated.

This report has been prepared under the Resource Management Act 1991 (RMA); Section 88, "Making an Application" and the Fourth Schedule, "Assessment of Effects on the Environment." The report aims to present clear information on the consent applied for by the Trust and the effects on the environment of the proposed activity, so that people can decide for themselves if they would like to make a submission in support of or opposition to the resource consent application, and have enough information to prepare a submission.

These applications are required as a consequence of changes in scheme layout since the earlier application, and these changes result from consultation with landowners.

1.2 Central Plains Water Enhancement Scheme

The area of the Central Plains Water Enhancement Scheme is located between the Rakaia and Waimakariri Rivers. Within this area it has been determined through scoping and feasibility studies that the possible scheme will involve the taking of water from three points, two on the Waimakariri River and another on the Rakaia River. Together these water takes will deliver water through a system of water races and channels, and with adequate storage will be able to irrigate an area of 60,000 ha, with a high level of reliability.

The key elements of the scheme as shown in Figure 1-1 include:

- An intake on the Waimakariri River above the confluence with the Kowai River and an inlet canal feeding water to the Waianiwiwa Reservoir via a tunnel through the Malvern Hills
- An intake on the Waimakariri River at the Gorge Bridge to bring water into the main headrace across the plains
- An intake on the Rakaia River approximately 8 km downstream of the Gorge Bridge to bring water into the main headrace across the plains
- A dam and consequent reservoir in the Waianiwiwa Valley to provide stored water that will discharge into the main headrace
- A level headrace that will run between the Rakaia and Waimakariri Rivers and deliver water to the distribution network
- A distribution network of water races down the plains providing water to all shareholder properties in the scheme area
- Pump stations to lift water from the headrace and inlet canal to land that is too high to be supplied by gravity in the Windwhistle and Springfield areas
- Bywashes and wetlands at the downstream end of network races to discharge surplus water back into surface waterways or groundwater.

Section 1

Introduction

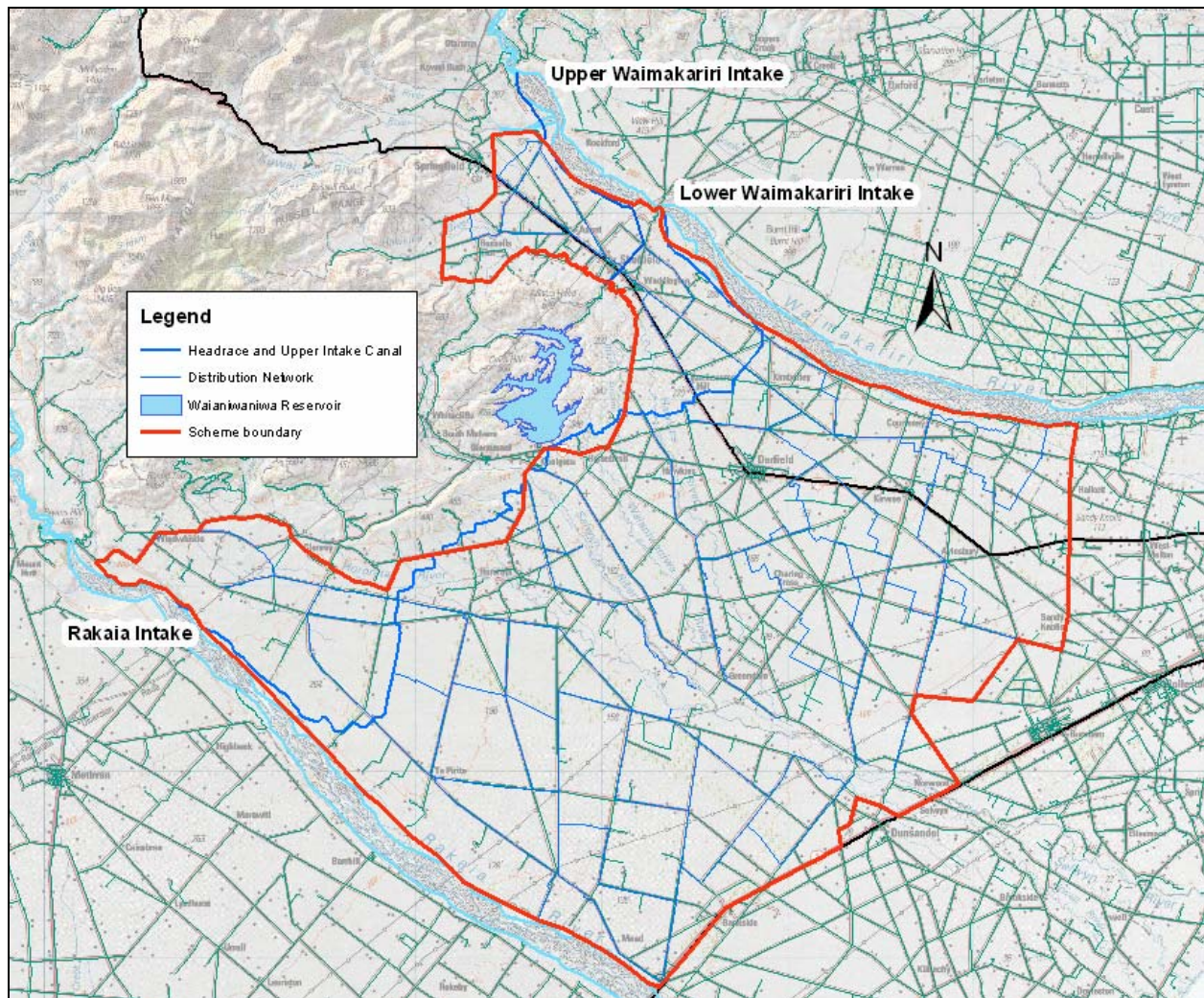


Figure 1-1: Central Plains Water Enhancement Scheme Layout

1.3 Background

For further information on the scheme background refer to the overall scheme Assessment of Environmental Effects dated June 2006.

1.4 Resource Consents

1.4.1 Previous Consent and Designations Applications Relating to this Scheme

In December 2001, the Christchurch City Council, the Selwyn District Council and the Ashburton Community Water Trust (ACWT) jointly applied for resource consents for takes from the rivers. For the Rakaia River takes the applicants are commonly referred to as the Central Plains Water Enhancement Steering Committee (CPWE) and the ACWT. For the Waimakariri River take the applicants are the Christchurch City Council and Selwyn District Council acting as CPWE. The application, which is sought for a term of 35 years is for the following activities:

Section 1

Introduction

- A take of up to 40 m³/s of water from the Rakaia River at or about map reference NZMS 260 K36:050-393, for irrigation, and water enhancement.
- A take of up to 40 m³/s of water from the Rakaia River at or about map reference NZMS 260 K36:072-391, for irrigation, and water enhancement.
- A take up to 40 m³/s of water from the Waimakariri River, at or about map reference NZMS 260 L35:331-604, for irrigation and water enhancement.

The takes from the Rakaia River will be managed by the applicants through an integrated water management agreement, such that the combined take will not exceed 40 m³/s. Through this integrated approach to water management, CPWE and ACWT would share equal priority for the water abstraction, up to a combined maximum of 40 m³/s which would then not exceed the combined maximum abstraction limit under the National Water Conservation (Rakaia River) Order of 70 m³/s. This would further allow water not required by one scheme to be made available to the other for use. This application is referred to as CRC021091. This application number also originally covered the 2001 application to take 40 m³/s from the Waimakariri but subsequently this has been renumbered CRC061972 by the Regional Council.

Since lodging, the entities involved in these applications have changed. CPWE interests are now transferred to the Central Plains Water Trust (CPWT), which will obtain the resource consents and then licence them to Central Plains Water Ltd (CPWL), the entity which will exercise the consents.

In June 2005, the Central Plains Water Trust applied to take up to 40 m³/s of water from the Waimakariri River, anywhere within the map reference range (at or about) NZMS 260 L35:250-677 to NZMS 260 L35:245-690 for irrigation and water enhancement. This application effectively works in parallel with and should be heard with the original CRC021091 (now CRC061972), also an application to take up to 40 m³/s of water from the Waimakariri River, albeit at a different location (NZMS 260 L35:331-604). The effect of this application, when exercised at the same time as CRC021091 (now CRC061972), is that at any one time no more than 40 m³/s of water will be taken from the Waimakariri River.

In November 2005, the Trust lodged applications with the Canterbury Regional Council for an extensive suite of consents relating to the implementation of the scheme and for the use of the water that is the subject of the above applications. These applications were notified in June 2006, with submissions closing in August 2006. Details on these applications can be obtained from the Canterbury Regional Council or from the Central Plains web site (www.cpw.org.nz).

In June 2006, the Trust lodged applications for land use consents and served a notice of requirement on the Selwyn District Council relating to the implementation and operation of the scheme. These applications were notified by Selwyn district council in November 2006 are open for submissions until 29 January 2007. Details on the applications can be obtained from the Selwyn District Council or from the Central Plains web site (www.cpw.org.nz).

In September 2006, the Trust lodged an application with the Canterbury Regional Council to take up to 17 m³/s of water from the Rakaia River within the terms and conditions of the National Water Conservation (Rakaia River) Order (NWCO). This application has not been notified yet.

1.4.2 Details of this Application

The proposed discharges from the operation of the Central Plains Water Enhancement Scheme, as described in Section 2 of this AEE, require the following resource consents to proceed:

1. Discharge permit application to Environment Canterbury to discharge operational bywash and emergency peak flow to land and water from the operation of the Central Plains Water Enhancement Scheme adjacent to the Selwyn River at or about map reference NZMS 260 L35: 289-421,

Section 1

Introduction

2. Discharge permit application to Environment Canterbury to discharge operational bywash and emergency peak flow to land and water from the operation of the Central Plains Water Enhancement Scheme adjacent to the Hawkins River at or about map reference NZMS 260 L35: 281–574.

1.5 The Assessment of Environmental Effects

Section 88(2)(b) of the RMA requires that every application must include, in accordance with Schedule 4, an assessment of environmental effects (AEE) in such detail as corresponds with the scale and significance of the effects that the activity may have on the environment.

This AEE has been prepared in accordance with the above, to support the application made by Central Plains Water Trust.

1.6 Structure of the Assessment of Environmental Effects

This Assessment of Environmental Effects (AEE) includes eight sections.

- Section 1.0** Introduction
- Section 2.0** The section provides a description of the proposed discharges.
- Section 3.0** Describes the alternative options to discharging into the wetlands and rivers.
- Section 4.0** Summarises the consultation process undertaken.
- Section 5.0** Provides a description of the environment.
- Section 6.0** Provides the assessment of environmental effects.
- Section 7.0** Discusses the mitigation measures proposed, including a section related to monitoring.
- Section 8.0** Covers the planning aspects in terms of the RMA, and Regional Policies and Plans.

Section 2

Description of Activity

For a general description of the scheme refer to Section 1.2 above, or for more details to the overall scheme Assessment of Environmental Effects dated June 2006. Details of the new discharges are included below.

2.1 Description of Discharge Points

Discharge points are required at the lower end of the distribution network to discharge surplus flow. Such flow is generated by operational bywash and emergency peak flow conditions. Figure 2-1 shows the two new discharge locations, circled with red.

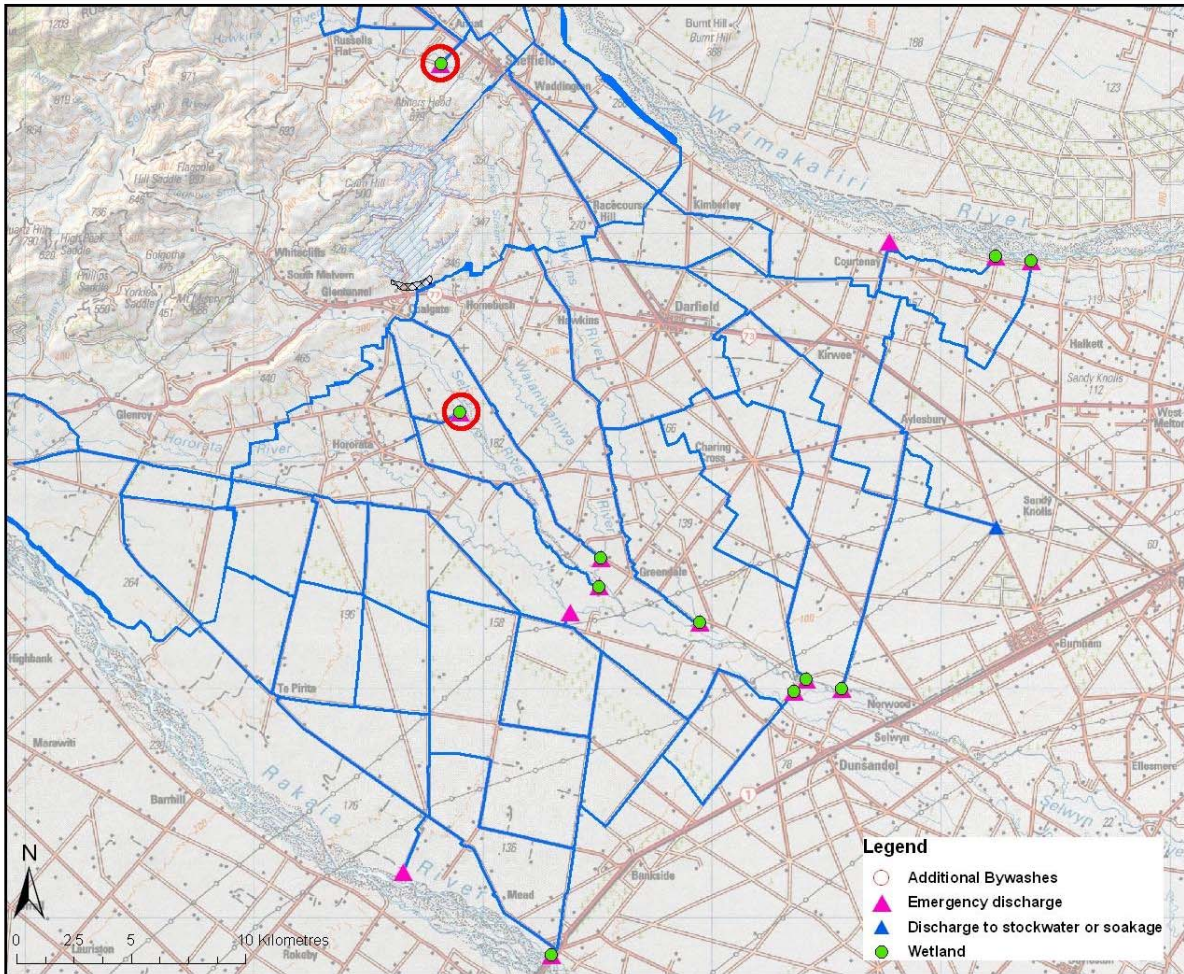


FIGURE 2-1: Discharge locations and wetlands

2.1.1 Operational bywash discharge

Under normal operations it will be necessary to discharge small volumes of surplus water at the end of the network branches. This is necessary to maintain flow past the last farmer taking scheme water on each race. This bywash will be minimised and in general discharged through ground soakage via constructed wetlands, to existing stockwater races (race D2.3), or into the headrace or reservoir inlet canal.

Section 2

Description of Activity

The wetlands will be located adjacent to existing water courses but to prevent overflow they will not have any surface water connection. Soils in the wetland will be permeable enough to absorb water through the soil profile to the groundwater table.

The design parameters of the two new proposed bywash sites are outlined below, and the locations are shown in Figure 2-1. Figure 2-2 illustrates a wetland typical of the type proposed for these applications.

Selwyn River Bywash

Race C 3.1 will discharge bywash at a maximum rate of 0.4 m³/s to a 0.1 – 0.2 ha wetland at about map reference NZMS 260 L35: 289-421, adjacent to the Selwyn River.

Hawkins River Bywash

Race SP 2.5 will discharge bywash at a maximum rate of 0.3 m³/s to a 0.1 ha wetland at about map reference NZMS 260 L35: 281–574, adjacent to the Hawkins River.



Figure 2-2: Subsurface flow wetland, typical of that to be provided at operational bywash discharge points

2.1.2 Emergency peak flow discharge

At rare and brief times the full intake flow may have to be discharged. This could occur when there is a district-wide power cut when the canals were carrying full flow capacity, thus water can not be pumped out of the canals and has to be discharged. Also a sudden heavy rainfall could cause such conditions, as irrigators shut down their pumps before the intake race gates are closed. It is important to recognise that the full extent of the consents sought is for an extreme case that might never occur in the life of the scheme and, if it did, it would last for only a few hours.

As the wetlands can usually not take such flow rates without overflowing, other measures will be required to manage these situations. A risk analysis will be conducted with help from key stakeholders, including identifying the consequences of large surplus flows in relation to the variety of associated causes. A number of management measures will be investigated, including building series of small storage weirs within the races, or backup power supplies, or discharging to land. It is probable that none of these would need consenting. A fallback option, most likely as a full solution or perhaps as a partial solution to be

Section 2

Description of Activity

implemented in conjunction with other measures, would be to build larger bywashes that could accommodate in total sum the full flow of the canals. To do this, separate races would be constructed at the discharge locations to bypass the wetlands that take normal operational bywashes, and transport water to adjacent watercourses. As this is the only option in view that is likely to need consenting, it is described in this report and consents are sought for this option. This is an important contingency move to cover the options available, pending further discussion with interested parties.

The design parameters of the two new proposed bywash sites are outlined below, and the locations are shown in Figure 2-1.

Selwyn River Bywash

Race C 3.1 is in the Hororata area, and will transport overflow water to the Selwyn River. The maximum flow will be 3 m³/s and the discharge location will be at about map reference NZMS 260 L35: 289–421, adjacent to the Selwyn River.

Hawkins River Bywash

Race SP 2.5 is in the Springfield area and will transport overflow water to the Selwyn River. The maximum flow will be 2.5 m³/s and the discharge location will be at about map reference NZMS 260 L35: 281–574, adjacent to the Hawkins River.

Section 3

Alternatives

3.1 Operational Bywashes

An alternative to discharging the operational bywash water to a wetland would be to discharge this water directly to the river. Consultation with the local Maori established that discharge via a wetland was the preferred option. This may have the benefit of removing some contaminants before it reaches the waterway.

Another alternative is to discharge to private land below the most downstream point of irrigation supply from a race. This would have an impact on private land. It also needs to be kept in mind that wetlands in or adjacent to riverbeds are considered to be potentially desirable features and they belong more naturally at riverbed sites.

3.2 Emergency Discharge Points

Alternative details were described in Section 2.1.2 above. At least at this stage the alternatives are not considered to be a full option for discharging the emergency flows to the rivers. These flows are only expected to occur in rare situations such as during a power cut or heavy flooding and would last for only a few hours.

Removing the emergency discharge points would potentially result in flooding of surrounding properties and possibly roads.

Section 4

Consultation

Material for this section has been provided mainly by Convergence Ltd and Byfield Budd and mainly describes consultation for the total Central Plains Water Enhancement Scheme.

In 2000 a joint committee was established by Selwyn District and Christchurch City Councils to investigate the opportunity to use water for the benefit of the wider community. As part of an initial feasibility study, the committee undertook extensive consultation with a wide range of stakeholder groups.

One of the first initiatives by the Central Plains Water Steering Committee was to establish a potential water users group, following six woolshed meetings within the proposed scheme area. Consultation revealed strong interest within the area for the proposed scheme and this group later became the Ritso Society, which has continued to be instrumental in furthering the scheme.

Following consultation with other interested stakeholders a consultative working party was established in mid-2000. This included representatives of groups that included potential water users, conservationists, outdoor enthusiasts, township committees, host communities, existing irrigators, Tangata Whenua and people living to the east of the proposed scheme where aquifer recharge from the scheme could be an issue.

There were two strands to the consultation – one focused on the interest within the farming community for a community based water enhancement scheme and the principles on which such a scheme should be based. The other sought to identify potential issues and how those issues might be addressed in a sustainable way.

The consultative working party identified key issues from an environmental, social, economic and cultural perspective. These issues were fed back to the scheme's technical experts and the Steering Committee to assist in decisions on the development of the scheme.

In 2003 Central Plains Water Ltd sought to raise funds to enable the scheme to apply for the resource consents needed to proceed. This required further consultation with the farming community and involved numerous meetings and focus groups to clarify scheme details, funding options and other preferences.

Central Plains Water Limited was established in mid-2003 as a commercial entity to raise sufficient share capital to obtain the resource consents. In 2003, during the fund raising phase, members of the Central Plains Water Trust met with farmers in the Waianiwaniwa Valley to discuss the scheme and the potential impact it would have on their farms.

Moving into the resource consent process in 2005, Central Plains Water Limited has continued to consult with a variety of interest groups.

The ongoing technical investigations are addressing valid issues previously identified by key stakeholders. Central Plains Water technical representatives are attempting to mitigate concerns that have arisen as a result of consultation.

The objective of the consultation is to find a balance between enabling sustainable use of water supplied by the Scheme, while, where possible, avoiding or mitigating any adverse effects. Many of the scheme's principles have been influenced by the consultation process, for example:

- To offset potential dust issues the floor of the storage dam will not be allowed to dry out;
- A Farm Plan for Sustainable Irrigation will be prepared and followed by each landowner addressing potential water use and contamination issues;
- The scheme proposals will work within the scope of the Rakaia National Water Conservation Order and the Waimakariri River Regional Plan; and
- The use of gravity to move water wherever possible.

Consultation will continue throughout the consent process and there will be ongoing opportunities for Central Plains Water to meet with stakeholders to address issues and concerns prior to the hearing.

More details of the consultation that has been carried out are documented in Section 5 in the Assessment of Environmental Effects for Resource Consent Applications to Canterbury Regional Council (URS, June 2006).

Section 4

Consultation

Consultation specific to this application has been only to inform local landowners of the proposal. However the principles were developed through consultation, particularly with tangata whenua, when considering the general means of bywash discharge for the whole scheme, and the details proposed here are in accordance with those principles.

Section 5

Description Of The Environment

For a general description of the environment refer to the overall scheme Assessment of Environmental Effects dated June 2006. Descriptions of the affected waterways are included below.

5.1 Selwyn River

The Selwyn River rises in the 1,600 m high Big Ben Range some 24 km northwest of Coalgate. It is fed by tributaries from the north slopes of the Harper Hills, and the central Malvern Hills, and has a catchment area above Coalgate of 235 km². Flow is monitored at Whitecliffs, 6.5 km west-northwest of Coalgate, and at Coes Ford near Leeston and summary flow statistics are shown in Table 6-3.

Downstream of Coalgate it flows out onto the Canterbury Plains and follows a 53 km long course southeast to Lake Ellesmere. It follows the junction of the coalescing alluvial fans built up by the Waimakariri and Rakaia Rivers, and for much of this distance it flows below ground except during floods. Permanent flow returns to the channel about 15 km from the lake. The Coes Ford monitoring station is 7.3 km from the lake.

Table 6-3: Summary flow statistics for Selwyn River

River (Site)	Catchment Area (km ²)	Flows (m ³ /s)		7 day low flow		Floods	
		Mean Flow	Mean Annual	10 yr return period	Mean Annual	10 yr return period	
Selwyn (Whitecliffs)	164	3.3	0.80	0.58	79	152	
Selwyn (Coes Ford)	678	3.3	0.63	0.31	156	338	

Source: <http://www.ecan.govt.nz/Our+Environment/Water/Rivers/RiverFlows/North-low-flow-statistics.htm> (accessed 21/10/05)

The scheme will affect the Selwyn River in a number of ways. The headrace will cross the channel near Coalgate via an embankment and siphon. Further downstream on the plains there will be a number of bywash wetlands within the scheme area. Outside of the scheme area there may be effects on the lower channel where increased groundwater flow may add to the discharge in the channel and increase the permanently wetted channel length.

5.2 Hawkins River

The Hawkins River rises in the 1,200 m high Russell Range, 10 km west of Springfield, and receives tributaries from the north slopes of the east and north Malvern Hills. The catchment area above Sheffield is ~ 120 km², and it flows a further 27 km south from here to join the Selwyn River. As with the other foothills rivers, it is dry through much of its course for most of the year.

The scheme affects the Hawkins River where the canal from the upper Waimakariri River intake crosses the river at Sheffield. There will be a short section of embankment and a siphon beneath the channel. There will also be a bywash discharge point near Sheffield township.

Section 6

Assessment Of Environmental Effects

For a scheme-wide assessment of environmental effects refer to the overall scheme Assessment of June 2006. The assessment of the effects on the environment related to proposed bywash discharges is detailed below.

Across the scheme there will be a number of bywash discharges at the lower end of the distribution network. Eleven will be located along the Rakaia, Selwyn, Hawkins and Waimakariri Rivers, and during normal operations a seasonal average of about 2 m³/s will be discharged into small wetlands varying from 200 m² to 0.5 ha in area. The water will soak to groundwater, and as each discharge will have a maximum rate of flow under normal conditions of between 1.5 m³/s and 0.1 m³/s, it is considered the physical effects will be de minimus.

During emergency situations such as a district-wide power failure, it may be necessary to discharge all of the water in the headrace and distribution network. At these times, a further three discharge points on the Rakaia, Hororata and Waimakariri Rivers will be used, bringing the total to 14. These larger flows will be routed directly to surface water, and will bypass the wetlands to avoid damaging them. The total bywash during emergency discharges will be up to 45 m³/s, spread over the 14 discharge locations, with a maximum flow at any one location being 18 m³/s. The discharge will only be for a few hours while the system is emptied. The discharge points will be designed to minimise any erosion of the bed or banks of the respective rivers. It is considered the physical effects of these discharges will be de minimus.

The bywash flows proposed for this application are for up to 0.4 m³/s and 0.3 m³/s as operational flows into the Selwyn and Hawkins Rivers respectively. Peak flows in an emergency will be up to 3 m³/s and 2.5 m³/s respectively. It is considered that their environmental effects will be de minimus as for the other bywashes already applied for.

Section 7

Mitigation

This section provides a description of the range of mitigations proposed throughout the scheme. These apply in general to the proposed bywashes although the scale of works there will make many of these mitigations unnecessary in these particular instances.

7.1 Section 17 RMA

Section 17 of the Resource Management Act (1991) places a duty of all people to avoid, remedy, or mitigate any adverse effect on the environment arising from an activity carried out by or on behalf of that person whether or not that activity is in accordance with a rule in a plan or resource consent.

7.2 Avoiding adverse effects on the environment

Where there are feasible options to avoid adverse environmental effects, this is the primary objective. This does not imply that any activity that may have an adverse effect should be avoided, as this would fail to meet the purpose of the Act, which is the sustainable management of natural and physical resources. Therefore the Act is about managing the effects and enabling people and communities to meet their foreseeable needs.

7.2.1 Management Plans

The construction activities will be controlled through the use of management plans. This is a tried and tested methodology to deal with activities and effects that cannot be defined fully at the time of resource consent application. Typically these plans identify all the sources of nuisance or hazard from a construction area and stipulate controls to avoid, mitigate or remedy these.

The management plans must be produced to comply with the conditions of consent, and will be lodged with Canterbury Regional Council and any other relevant parties (e.g., NZHPT, Transit New Zealand, etc) prior to commencing construction. They build on the requirements set out in any consent conditions and are applied to the specific designs for the project, the staging of its components and the methods of construction, all of which will only be known as the Scheme nears construction. These plans, once approved, then become rules for the contractor's management and operation of the activity.

Contractors involved in the scheme's construction will be required to prepare Construction Management Plans that include the following components:

Land Rehabilitation Plan

The proposed Land Rehabilitation Plan will address land restoration and rehabilitation requirements for the construction zone generally where land has been disturbed, race embankments, and construction storage areas. This plan will detail final contours and finished heights of earthworks; the methods for stripping, storing and re-using topsoil; vegetation removal and replanting requirements; and the rehabilitation of haul roads. In addition, provision will be made for the identification of specific ecological, heritage, cultural or geological features within or immediately adjoining the construction zone which are to be protected, the methods of such protection, and the identification of the features.

A Remediation Action Plan (for contaminated areas)

A Remediation Action Plan for contaminated areas will be prepared and lodged prior to any construction occurring and will be adhered to where construction of the race results in the disturbance of contaminated land (e.g., landfill, farm dump, offal pit, septic tank, silage pits, dairy effluent disposal ponds).

As a minimum the Remediation Action Plan will address

- The earthworks and transport controls to minimise the off-site mitigation of contamination (via air or water during the remedial works).
- Appropriate measures for the control of dust or odour;

Section 7

Mitigation

- The diversion of stormwater away from the remedial works;
- The treatment of contaminated stormwater or groundwater in the remediation area;
- Sampling and reporting;
- The health and safety requirements for remediation workers.

Hazardous Substances Management and Contingency Plan

These plans shall address storage and management requirements for hazardous substances, and contingencies and responses in the event that these substances are spilled.

Heritage Management Plan

Heritage Management Plans will be prepared to cover any destruction, damage or modification to any archaeological site, or historic site or building classified under the NZ Historic Places Trust Act 1993 and will identify any conditions to be complied with in relation to heritage.

Dust Management Plan

The Dust Management Plan will document:

- methods of dust suppression including use of sprinklers and water carts, and revegetation of stockpiles where appropriate;
- dust monitoring requirements;
- responsibilities for consultation with local residents about dust during construction;
- identification of areas which are sensitive to the effects of dust (eg, houses, specific crops, utilities, orchards) and identification of specific measures to mitigate the effects of dust on these sites;
- regular public road maintenance to ensure optimal surface conditions;
- proposed methods of providing a cleaning service to residents and businesses affected by dust from construction activities.

Noise Management Plan

The Noise Management Plan will be implemented in tandem with conditions of consent imposing specific noise controls. As such the Noise Management Plan will detail the noise sources associated with the construction of the distribution races and the noise control methods required to achieve compliance with conditions of consent imposing maximum noise levels. The Noise Management Plan will also document contingency plans (in the event that noise limits are exceeded), monitoring procedures, and complaints procedures. Finally, the Noise Management Plan will provide for the monitoring and management of any effects associated with vibration.

Traffic Management Plan

A Traffic Management Plan will be prepared and provided to both the Selwyn District Council and Transit New Zealand. This management plan will primarily address the management of construction traffic on public roads and locations where the distribution races and/or haul roads intersect with public roads. In particular, the Traffic Management Plan will require:

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- The erection of signs on all public roads warning motorists of haul road intersections and associated hazards.
- Warning signage prohibiting public access to construction areas.
- Details of stock crossing methods as determined following consultation with local farmers.
- The notification of all temporary local road closures to local emergency services.
- All construction vehicles to be fitted with flashing lights while operating in the construction zone and on haul roads.
- Construction vehicles to comply with the Land Transport Safety Authority requirements for vehicle dimensions and mass on public roads, unless specific over dimension permits are obtained.
- Movement of oversize vehicles and equipment on SH 1, SH73 and SH 77 to comply with Transit New Zealand requirements.
- Road signs to be erected on roads where necessary to warn motorists of the hazard caused by fog or frost.
- Road safety audits to be carried out every six months of traffic signals/stop signs controlling the intersections of all public roads with haul roads and the review of these audits and implementation of any necessary steps to ensure motorists do not suffer unreasonable delays.
- The use of dust suppressant to mitigate the effects of dust.
- The maintenance of vehicles and machinery to mitigate the effects of fumes.

In addition to the general provisions of the Traffic Management Plan outlined above, particular measures shall be identified in a Traffic Management Plan dealing with State Highway intersections with haul roads. This plan shall be developed in accordance with the Transit New Zealand Code of Practice for Temporary Traffic Management.

Accidental Discovery Protocols

An accidental discovery protocol will be developed to cover instances where archaeological sites (prehistoric (Maori) and historic) are unearthed during the construction phase. This protocol will require an on-site assessment by a qualified archaeologist, notification of the New Zealand Historic Places Trust and Ngai Tahu, and further excavations, examinations and recording where necessary.

Health and Safety Plan

Whilst of limited relevance in terms of effects on the environment, the Health and Safety Plan will primarily stipulate codes of practice and relevant construction regulations that contractors will be required to follow. In addition, the Health and Safety Plan will also include information on hazard identification, management and mitigation, public consultation and information sharing requirements, emergency protocols and incident reporting.

In addition to the management plans referred to above, draft conditions of consent proposed by the applicant are included in Appendix D to this application. These conditions outline the key requirements and performance measures for the various management plans above, including the methods for avoiding, remedying or mitigating adverse effects on the environment and requirements for monitoring and reporting.

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Other management plans

Additional management plans may be prepared covering, for example:

- Risk Management Plan
- Stormwater Management Plan
- Spill Contingency Plan

7.2.2 Sustainable Farming

Many of the potential effects that have been identified as matters of concern during previous consultation have resulted in the development of strategies to avoid adverse effects. In particular the sustainable management of agricultural systems is paramount for the protection of ground and surface water resources, and this is being addressed particularly through the sustainability code of practice.

7.2.3 Ritso Society Irrigation Sustainability Code of Practice

The Ritso Society, formed in 2002, is named after Mr GF Ritso who in 1883, as engineer for Malvern County, had the vision for an irrigated Central Plains region. The Society has close links to the Central Plains Water Trust, and Central Plains Water Ltd, but is a separately incorporated body. They are currently undertaking a project supported by a Sustainable Farming Fund Grant and with funding from CPWL, the Ritso Society and others, that aims to bring together the wide range of information on irrigation already available and being developed in current projects; identify gaps in this information; and where practicable initiate further work to cover these issues. From this information an Irrigation Scheme Sustainability Code is being developed and tailored to the Central Plains Scheme.

While it is a major task to develop this code, it is also recognised that a vitally important aspect of the process is ensuring that primary producers, business people, and others participate in the development of the code, and embrace its implementation both at the individual on-farm level, and through the governance of the Water Enhancement Scheme by Central Plains Water Trust, and Central Plains Water Ltd.

In developing the code, key stakeholders from both the agriculture sector and wider community will be brought together to develop key aspects related to:

- Water efficiency measures;
- Water quality measures;
- Contractual requirements; and
- Use of economic instruments to achieve efficiency of use.

The key outputs of the project will be:

- A best practice irrigation scheme sustainability code that
 - Enables users to achieve best practice environmentally, and economically (i.e. maximise returns from minimum inputs);
 - Is practical and economically viable for water users;
 - Is dynamic and can be adapted over time to incorporate new technologies, and deal with new issues as they arise;

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- The code will seek to ensure that adverse effects of the Scheme can be avoided or managed in both the design and operational phases of the Scheme;
- A workable framework for water and emissions trading;
- A process to allow intensification following irrigation to be achieved and monitored in a way that avoids or remedies adverse environmental effects; and
- Full reporting on processes, outputs, outcomes, and lessons learned. whereby

As a result, the individuals, organisations and networks involved in the code will become more knowledgeable about the key factors that will ensure development of irrigation that is socially and environmentally sustainable and economically viable.

7.3 Proposed Monitoring

Monitoring needs to be developed within a risk based framework. Where the potential risk of an adverse effect is high, then there should be more monitoring. Where the effects are well understood, easily mitigated, and remedied and minor, then no monitoring may be needed. Monitoring is designed to ascertain the effects of the consented activities and is not to be used to create data bases on the state of the environment – that being a Regional Council function. Monitoring also needs to be developed in conjunction with the resource consent conditions.

It is the intention of CPWL to commit to advance the detail of these applications in consultation with the various stakeholders to identify the monitoring required. For this reason no specific monitoring is proposed in this document, however the areas that CPWL anticipate will require monitoring are identified below.

7.3.1 Water distribution

The flows throughout the distribution system will be monitored. Each and every take from the system by the water users will be monitored for flow. Flow at the turnout structures will be determined based on gate settings and water surface levels. This information will be used to ensure the appropriate volume of water is discharged down the correct distribution canal.

7.3.2 Bywash volumes

At the ends of the distribution system there will be bywash discharges to wetlands, surface waters and groundwater. These will be measured through control structures.

7.3.3 Wetland functioning

Wetlands developed for the purpose of bywash filtering or environmental enhancement will require periodic inspections to ensure sufficient water is provided to maintain a healthy ecosystem.

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Statutory Framework

8.1 Introduction

This section assesses the statutory framework applicable to the proposed discharges, with particular respect to the Resource Management Act 1991 and the underpinning Regional and District Plans.

The following statutory documents are reviewed and assessed in this section:

- Resource Management Act 1991
- Canterbury Regional Policy Statement
- Transitional Regional Plan
- Natural Resources Regional Plan

8.2 Resource Management Act 1991

8.2.1 Part 2 – Purpose and Principles

Section 5

Section 5 of the RMA contains the purpose of the Act:

5. Purpose

- (1) *The purpose of this Act is to promote the sustainable management of natural and physical resources.*
- (2) *In this Act, “sustainable management” means managing the use, development, and protection of natural and physical resources in a way, or at a rate, which enables people and communities to provide for their social, economic, and cultural wellbeing and for their health and safety while –*
 - (a) *Sustaining the potential of natural and physical resources (excluding minerals) to meet the reasonably foreseeable needs of future generations; and*
 - (b) *Safeguarding the life-supporting capacity of air, water, soil, and ecosystems; and*
 - (c) *Avoiding, remedying, or mitigating any adverse effects of activities on the environment.*

Section 6

Section 6 of the RMA contains matters of national importance, to be recognised and provided for in achieving the purpose of the Act:

6. Matters of national importance

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall recognise and provide for the following matters of national importance:

- (a) *The preservation of the natural character of the coastal environment (including the coastal marine area), wetlands, and lakes and rivers and their margins, and the protection of them from inappropriate subdivision, use, and development:*
- (b) *The protection of outstanding natural features and landscapes from inappropriate subdivision, use, and development:*
- (c) *The protection of areas of significant indigenous vegetation and significant habitats of indigenous fauna:*
- (d) *The maintenance and enhancement of public access to and along the coastal marine area, lakes, and rivers:*
- (e) *The relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu, and other taonga.*
- (f) *The protection of historic heritage from inappropriate subdivision, use, and development.*
- (g) *The protection of recognised customary activities.*

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Section 7

Section 7 of the RMA contains other matters which shall be given particular regard to in achieving the purpose of the Act:

7. Other matters

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall have particular regard to –

- (a) *kaitiakitanga:*
- (aa) *the ethic of stewardship:*
- (b) *the efficient use and development of natural and physical resources:*
- (ba) *the efficiency of the end use of energy:*
- (c) *the maintenance and enhancement of amenity values:*
- (d) *intrinsic values of ecosystems:*
- (e) *repealed.*
- (f) *maintenance and enhancement of the quality of the environment:*
- (g) *any finite characteristics of natural and physical resources:*
- (h) *the protection of the habitat of trout and salmon:*
- (i) *the effects of climate change:*
- (j) *the benefits to be derived from the use and development of renewable energy*

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Section 8 of the RMA states the role of the Treaty of Waitangi in achieving the purpose of the Act:

8. Treaty of Waitangi

In achieving the purpose of this Act, all persons exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources, shall take into account the principles of the Treaty of Waitangi (Te Tiriti o Waitangi).

In the original application it was noted that the CPW scheme has the potential to deliver social and economic benefits to the community, while sustaining the water and land resources, maintaining their life-supporting capacity, and avoiding, remedying or mitigating adverse effects on the environment. Through careful design, construction and operation methods, significant environmental values within the project area can be maintained and in many instances enhanced.

The above statement is also true for the four proposed discharges. The discharges are not contrary to any of the matters of national importance listed in s6 of the RMA, any of the other matters listed in s7 of the Act, nor the Principles of the Treaty of Waitangi referred to in s8 of the RMA.

8.3 Canterbury Regional Policy Statement

The Canterbury Regional Policy Statement (RPS) became operative in June 1998. The RPS provides an overview of the resource management issues of the region and its chapters contain objectives, policies and methods relating to specific resources of the natural and physical environment. The chapters of particular relevance to the discharges are:

- Chapter 5 - Matters of Resource Management Significance to Tangata Whenua
- Chapter 6 - Provision for the Relationship of Tangata Whenua with Resources
- Chapter 8 - Landscape, Ecology and Heritage
- Chapter 9 - Water

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- Chapter 14 - Energy
- Chapter 16 - Natural Hazards

The provisions contained in Sections 5-8 of the RMA provide the framework for the objectives and policies of the RPS. The RPS in turn provides the framework for the issues, objectives, policies and methods of the underlying Regional Plans. These are discussed in greater detail in the following sections.

8.4 Transitional Regional Plan

There are no rules in the Transitional Regional Plan which are relevant to the proposed discharge activity. Therefore, Section 77C of the RMA is applicable to the proposed activity.

Section 77C of the RMA states:

An application for a resource consent for an activity must, with the necessary modifications, be treated as an application for a resource consent for a discretionary if—

- (a) *Part 3 requires a resource to be obtained for an activity and there is no plan or proposed plan, or no relevant rule in a plan or proposed plan.*

Therefore the proposed activity is classified as a **discretionary activity** under the TRP

8.5 Natural Resources Regional Plan

A resource consent is required from Environment Canterbury under the Natural Resources Regional Plan as summarised in Table 8-1 below.

Figure 8-1: Summary of Activity Status under the Proposed Natural Resources Regional Plan

Consent Type	Activity	Relevant Rules	Activity Status
Section 15 Discharge Permit (to water)	Discharge of water and contaminants to water from operational flow and emergency peak flow associated with the CPWES	Rule WQL 1 Rule WQL 56	Discretionary Activity

Rule WQL1 states:

The point source discharge of water or a contaminant into a surface water body, or onto land in a manner which may result in water or a contaminant entering a surface water body, is a permitted activity if the discharge complies with all the conditions of this Rule.

Rule WQL1 also states:

A discharge which does not comply with:

1. Any one or more of Conditions 1 to 6 and 8-11 is a **discretionary activity**, requiring a resource consent under Rule WQL 56; or
2. Condition 7 is a **non-complying** activity, requiring a resource consent under rule WQL60.

The proposed activity does not comply with a number of conditions numbered 1-6 and 8-11 of Rule WQL1 therefore, the proposed activity can be classified as a **discretionary activity** under Rule WQL56.

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8.5.1 Objectives and Policies

The objectives and policies of the following chapters are relevant to the discharge application.

- Chapter 4 – Water Quality (WQL)

The key objectives and policies are detailed below.

Chapter 4 – Water Quality

Objective WQL1.1 Rivers

- (1) *Where the river water quality or the physical and chemical characteristics of the riverbed substrate are:*
[...]
- (b) *not in a natural state, as a result of point source or non-point source discharges, the water quality and the riverbed substrate are maintained or improved so that:*
- they are suitable for contact recreation in those reaches that are valued for this purpose;*
 - water is suitable for stock drinking water;*
 - they are suitable as a habitat for indigenous species or salmonids;*
 - they provide for amenity values;*
 - they provide for Ngāi Tahu cultural values, including mahinga kai.*
- (2) *In addition, where the water quality, or the physical and chemical characteristics of the riverbed substrate:*
- (a) *equals or is better than the numerical outcomes for indicators of nutrient status and sedimentation of riverbed substrate for the river type, specified in Table WQL5, the water quality and substrate are maintained in that condition; and*
- (b) *does not meet the outcomes in Table WQL5, the water quality or the characteristics of the substrate are improved so that:*
- the outcomes in Table WQL5 are achieved; and*
 - there are no visible heterotrophic slime growths in the river.*
- (3) *Where the water quality of a river, or the physical and chemical characteristics of the riverbed substrate, have been or are likely to be affected by a change to the flow regime of a river as a result of; augmentation of flow, damming, diversion, or discharge of water or contaminants:*
- (a) *the instream values in the river, which existed before a change to the flow regime, are provided for, by ensuring that:*
- any change to water quality, including changes to; clarity, natural water temperature, dissolved oxygen concentrations, or contaminants caused by reducing or low oxygen conditions;*
 - sedimentation of the riverbed; or*
 - excessive growth of periphyton, or aquatic plants;*
- have no significant adverse effects on the instream values of the river; or*
- (b) *where the instream values have been adversely affected by a change to the flow regime, the water quality of the river and the physical and chemical characteristics of the riverbed substrate, are improved to restore, as far as practicable, the instream values of the river that existed before the change to the flow regime; and*
- (c) *the quality of river water recharging groundwater will not prevent the achievement of Objective WQL2.*

Policy WQL1 Point source discharges to surface water

- (1) *Before allowing a point source discharge of:*

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- (a) *a contaminant, excluding those contaminants specified in Policy WQL 2, into surface water or onto land where a contaminant may enter surface water, ensure that:*
 - (i) *measures are or will be applied to avoid the production of the contaminant, or to reuse, recover, or recycle materials to minimise the volume and concentration of the contaminant in the discharge, and*
 - (ii) *the discharge to an existing treatment and discharge system or network is not a practical alternative, and a discharge into or onto land cannot be undertaken in accordance with Policy WQL6.*
- (b) *water, including water from one catchment being discharged into another part of the same catchment or into another catchment, ensure that:*
 - (i) *the mixing of the waters as a result of the discharge avoids significant adverse effects on Ngāi Tahu cultural values; and*
 - (ii) *the discharge of water will not facilitate the movement of pest plant or animal species, or other exotic species, between catchments; and*
 - (iii) *the discharge of water will not result in the introduction of plant and animal species that do not naturally occur in the receiving catchment, and*
 - (iv) *the discharge of water will not significantly alter the water quality, or characteristics of the bed substrate, aquatic ecosystems or values of the receiving water body, and the water of the river or lake continues to meet the relevant outcomes in Objective WQL1.*
- (2) *If the requirements of Policy WQL1(1) are satisfied and a discharge of a contaminant or water into water in a river or lake is necessary:*
 - (a) *the following matters shall apply when determining the size of a Zone of Non-Compliance, where the water quality standards for the river or lake may not be achieved:*
 - (i) *the discharge of a contaminant shall be into water and the Zone shall be as small as practicable, and either alone, or in combination with other Zones of Non-Compliance shall not occupy a significant proportion of the receiving water body; and*
 - (ii) *take into account the assimilative capacity of the receiving water under low flow conditions for the river, or low levels for a lake, or the equivalent flow or level where the flow has been modified by any take, use, dam, diversion or discharge; and*
 - (iii) *the Zone shall not create a barrier to fish migration or limit contact recreation in areas which support high levels of use; and*
 - (iv) *the Zone shall not result in a significant impact on Ngāi Tahu cultural values; and*
 - (v) *the discharge shall not result in the accumulation of persistent compounds in aquatic ecosystem or in sediment within the Zone of Non-Compliance; and*
 - (b) *the water quality, outside of the Zone of Non-Compliance in a river or lake shall meet the standards specified for that river or lake either in Schedule WQL1 or in a relevant water conservation order.*
- (3) *Where the existing surface water quality does meet the water quality standard for the water body specified in Schedule WQL1, the discharge shall not be allowed unless it can be demonstrated that the adverse effects of the discharge on the receiving water quality, outside of the Zone of Non-Compliance, are not likely to result in water quality which is less than the water quality standard set for the receiving water.*
- (4) *Where the discharge occurs within the following areas, the water quality standard for that river or lake shall be met at the point of discharge:*
 - (a) *within one kilometre upstream in a river, or within a one kilometre radius on a lake, from an intake for a community drinking water supply;*
 - (b) *in a river where the flow is to be maintained in a natural state;*
 - (c) *an area identified as a significant spawning reach for salmon.*

Impacts on the water quality of surface water bodies, resulting from construction activities and discharge of surplus water, have been discussed previously in the original resource consent application and associated AEE and in Section 6. Construction-related effects are considered to be minor, of a short-term nature, and can be mitigated through normal design and construction methodologies. Operation of the

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scheme may in the initial years involve the discharge of lower quality water from the reservoir to the headrace canal. This could lead on to the Selwyn bywash proposed in this application, but not to the Hawkins site as it will be supplied directly by run-of-river water from the upper Waimakariri intake. Mitigation measures will ensure the quality of discharges will meet requirements of Schedule WQL1 and Table WQL5 in Chapter 4 of the PNRRP. Overall there are not expected to be any adverse changes in water quality in surface water receiving environments as a result of the discharges associated with the scheme. Given this, it is considered that the proposed discharges will be consistent with the relevant objectives and policies of the Canterbury Natural Resources Regional Plan.

Section 9

References

URS New Zealand Limited (June 2006), Central Plains Water Enhancement Scheme: Assessment of Environmental Effects for Resource Consent Applications to Canterbury Regional Council