RESOURCE MANAGEMENT ACT 1991

DECISION OF ENVIRONMENT CANTERBURY

ON A RESOURCE CONSENT APPLICATION

APPLICATION REFERENCE:	**CRC092692**
APPLICANT:	Christchurch City Council
SITE ADDRESS:	Various
PROPOSAL:	Discharge of groundwater, wastewater and stormwater from 22 overflow points in the Christchurch wastewater system during wet weather events, to the Avon and Heathcote Rivers and tributaries and the Avon Heathcote estuary.
ACTIVITY STATUS:	Discretionary
DATE OF HEARING:	4, 7 and 18 May and 30th June 2010
HEARINGS PANEL:	Commissioners David W Collins, Terry Scott and Emma Christmas
APPEARANCES:	<u>Applicant</u> Mr Cedric Carranceja – Counsel for CCC Mr Michael Bourke – Operations and Maintenance Manager for City Water and Waste, CCC Mr Timothy Preston, Senior Water Engineer, GHD Dr Neale Hudson, Environmental Consultant, NIWA Mr Clifford Tipler, Environmental Engineer, URS Mr Stephen Brown, Marine Ecologist, NIWA Dr Alastair Suren, Freshwater Ecologist, NIWA

Mr Daniel Murray, Senior Planner, URS

Submitters in opposition

Mr Murray Sim, Christchurch Estuary Association

Mr Philip Ross, Royal Forest and Bird Protection Society

Mr Peter Tuffley, Beckenham Neighbourhood Association Inc.

Mr Bruce Bellis, Inner City West Neighbourhood Association (ICON)

Mr David Higgins, Te Runanga O Ngai Tahu

Mr Ben Te Aika, Te Runanga O Ngai Tahu

Mr Paul Horgan, Te Runanga O Ngai Tahu

Mr Martin Ward, Avon Heathcote Estuary Trust / Ihutai Trust

Mr John Lewis, Steroid Biochemist, on behalf Avon Heathcote Estuary Trust / Ihutai Trust

Mr Michael Case, Case Family

Mr Justin Prain, development consultant for the Case Family

Dr Alistair Humphrey, Medical Officer of Health, Canterbury District Health Board

Council Officers

Mr Bruce Apperley, AECOM Ltd

DECISION: **Consent is granted subject to conditions for a duration of 15 years**

UNDER The Resource Management Act 1991

IN THE MATTER OF Resource consent application CRC092692 by Christchurch City Council to discharge groundwater, wastewater and stormwater from overflow points in the Christchurch wastewater network into the Avon and Heathcote Rivers and tributaries and drains leading to the Avon Heathcote Estuary

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1. INTRODUCTION

The Christchurch wastewater system transports wastewater from domestic and commercial properties via underground pipes and pumping stations to the wastewater treatment facility at Bromley. There the wastewater is treated and discharged (since early this year) via an ocean outfall approximately 3 km offshore.

While the wastewater network is separate from the stormwater network, at times of wet weather it suffers from ingress of stormwater through illegal connections, inlets and vents and groundwater through leaky pipes. This inflow is referred to as 'inflow and infiltration' (I&I).

At times of wet weather, I&I can be sufficient to overwhelm the wastewater system. To accommodate this, overflows were built into the network of pumping stations when the system was constructed. These allow overflow of untreated wastewater, diluted by groundwater and stormwater, into the Avon and Heathcote Rivers and tributaries. Controlled overflows at these sites prevent overflow elsewhere, for example through manholes covers or gully traps into the streets or onto private properties.

The wastewater network has 114 overflow points. Computer modelling has indicated that 22 of these sites are known or expected to overflow. In 2002, consent was granted to discharge from 12 of these sites. At that time, these were the only sites predicted to overflow more often than once in every two years. Consent was granted on the basis that the network was improved such that these sites discharged no more frequently than once every two years (a 2 year average return interval or 'ARI') by 2010.

Works totalling $40 million, the original anticipated costs of the upgrade, have been completed, however it is now estimated that a further $110 million will be required to achieve the 2 year standard at all outfalls for the duration of the consent. Compliance with the existing consent has therefore not been achieved.

The present application has been made to increase the maximum frequency at which discharges may occur to, on average, once every six months. This standard was originally to have been achieved by 1 June 2017, however amendments to the application mean that for most sites this will be achieved at the date of commencement of consent. In addition, further modelling has identified an additional 10 sites where discharges are expected to occur. (The application was originally for an additional 13 sites, however this has since been amended). Two of these sites, PS1/11 and PS 41/1, are expected to overflow only every 20 and 10 years respectively, but are included in the application as the overflow frequency may increase over time.

A 25 year duration of consent is sought.

2. NOTIFICATION AND SUBMISSIONS

The application was originally publicly notified on 13th and 14th February 2009. However corrections were then made to the map references and map locations of the overflow sites and it was re-notified on 27th and 28th February 2009 as follows:

Applicant: Christchurch City Council

CRC092692 – to discharge groundwater, wastewater and stormwater from up to 23 overflow points in the Christchurch wastewater network during wet weather events. Groundwater, wastewater and stormwater will be discharged into the Avon and Heathcote Rivers and tributaries, and into drains entering the Avon-Heathcote Estuary. Each overflow point may discharge on average no more than once every six months from 1 June 2017 and may discharge more frequently than this prior to 1 June 2017. The discharges may include contaminants such as micro-organisms, organic material, suspended sediment, nutrients, heavy metals and hydrocarbons.

2.1 Submissions

Sixty submissions were received, of which 58 were opposed. Twenty-one submitters wished to be heard. The majority of the submissions raised similar issues, particularly the unacceptability and offensiveness of discharging untreated wastewater into Christchurch's rivers. They highlighted the recreational use of the waterways and estuary, the perceived health risk and the effect of the discharges on the City's image. Many considered the requested consent duration as being too long.

3. PRELIMINARY MATTER – CHANGE TO APPLICATION

Since notification, two overflow sites have been removed from the application and a further site (PS7/2) has been included. This latter site is an alternative to one of the deleted sites, PS7/3. The question arises as to whether we can hear the application in relation to the new site without the need for re-notification.

Site PS7/3 was erroneously included in the original application. It is in fact blocked off and cannot overflow. PS7/2 is 270 m upstream on the same sewer system. It is expected to overflow.

Mr Carranceja advised us that the tests for assessing the need for further notification of an amendment to an application, based on Coull v Christchurch City Council[1], are:

- Does [the amendment] increase the scale or intensity of the activity?
- Does it exacerbate or mitigate the impacts of the activity, both in terms of adverse effects and in terms of the plan and other superior documents?
- Would parties who have not made submissions have done so if they were aware of the change?

In regards to the first two tests, we do not consider the scale or intensity of the discharge or its adverse effects, will be altered. The overflows are close together on

[1] C77/2006, 12 June 2006, Judge Smith

the same system. Both discharge into Dudley Creek on Stapletons Road. The modelling work undertaken erroneously included the PS7/2 datum level at the PS7/3 location, so the predictions of the frequency of overflow are unlikely to alter.

With regards to the third test, we understand site notification was achieved by attaching a notice to a tree or lamppost and by general notification through the Star and Press newspapers. Immediate neighbours were not directly notified. The sites are within a few minutes walk from each other. There is a pleasant walking path beside Dudley Creek and anyone using this path would likely have seen the notice. Residents living close to PS7/2 who do not use the walking path could have seen the notice while driving down Stapletons Road, as PS7/3 is located closer to the city.

We are satisfied the three tests are met and we are able to decide the application without the need for further notification.

4 SITE VISIT

Commissioners Collins and Scott undertook a visit to discharge points at Fendalton Road, River Road, Dudley Creek in the vicinity of the Case property and the Beckenham Loop area, on 18th May. They were accompanied by Mr Owen O'Neill of the CCC Wastewater Department.

We noted that the overflow pipes were generally under water and any discharge was unlikely to be seen. There was an unpleasant odour at the River Road pumping station and we are concerned about the potential health risk to workers having to service this outfall. At the Beckenham Loop there were walking tracks beside the river, and several people (plus four dogs) were observed walking while we were there. There were picnic tables in the area.

We also viewed the small jetties built by the CCC to allow easier access for people to the water at several locations.

Commissioner Christmas visited the Stapletons Road and River Road sites on 19th May. One kayaker and considerable numbers of waterfowl were observed upstream from the River Road outfall, in drizzly conditions.

On 26th May a spill occurred at the Fendalton Road pumping station following heavy, persistent rain. Commissioner Collins took the opportunity to visit the site. The river was very high but not particularly turbid. Very little in the way of overflow was visible, including floatable material. Two signs referring to 'pollution' were tied to the bridge railings. No signs were visible immediately downstream where people may walk along the track close to the water.

5 ISSUES AND CONSIDERATION

5.1 Status of the application

There was no dispute between parties that the status of the application is a discretionary activity. It is an innominate (and therefore discretionary) activity under the Transitional Regional Plan. Under the Proposed Natural Resources Regional plan (PNRRP) it is a prohibited activity under Rule WQL15 (the discharge of untreated or treated sewage effluent into a river, lake or groundwater). However, as

the plan is not yet operative, section 77(1)(c) requires that it is treated as a discretionary activity.

5.2 Principal issues

The need for overflows

Firstly, we discuss the need for the overflows, as this is critical to the decision to grant or refuse consent.

Mr Bourke explained the history of the Christchurch wastewater system. It was initially constructed, and has been maintained, as separate from the stormwater system. However, over time infiltration and inflow (I&I) of groundwater and stormwater has been a problem. Much of the wastewater network is over a century old and subsidence, deterioration of pipes and intrusion of tree roots all contribute to increased I&I.

Groundwater levels in Christchurch vary over 0.5 – 1 m both seasonably and during rainfall events. When groundwater levels are above the sewers, pressure increases and water flows into the pipes through cracks and joints. Stormwater can enter directly through illegal stormwater connections, manhole vents or from the rivers or stormwater drains.

Mr Bourke explained that there were two ways by which overflows could be stopped completely: by reducing or preventing I&I or by increasing pipe capacity. Reducing or preventing I&I would involve replacing much of the sewer network (1,770 km) and associated manholes. While some pipe replacement does occur annually, at present only approximately 4.7 km per year is replaced, at a cost of $3.6 M. To replace the entire network over the next 25 years would cost in the order of $60 M per year, requiring a 21% increase in rates. These figures do not include replacement of the trunk mains or pipes on private property. Further, if I&I was eliminated completely, operational problems would result, as a certain amount of inflow of groundwater is required to move solids along the pipes.

Increasing pipe capacity may provide a cheaper alternative, however problems associated with this include sediment build-up, odour and corrosion problems from having low flows in large pipes.

Mr Bourke's view was that that total prevention of overflows is impractical and poor use of public resources. We accept this position. Completely preventing I&I is clearly prohibitively expensive. The Council is installing larger capacity pipes in some of the planned upgrade works such as the Western Interceptor and the Fendalton Duplication. However, works to replace all pipes with larger capacity pipes will take considerable time. In addition, increases in the City's population, rainfall, groundwater level rise and deterioration of pipes means a continual deterioration in the effectiveness of the network. This was explained to us by use of a saw-tooth graph. Capital works reduce the frequency of overflows in part of the system by a given amount, then over time overflows gradually increase, until further capital works are undertaken. We accept therefore, the necessity for overflows. The question then becomes, what frequency of overflows is acceptable?

Frequency of overflows

The application made, to change the required 2 year ARI at 12 pumping stations to a six month ARI (achievable by 2017), plus add an additional 10 pump stations, has

understandably given the impression that standards were being relaxed, and that the applicant sought to discharge more untreated wastewater into the rivers than had previously occurred.

Having heard the evidence and discussed the matter during the hearing, it is clear that CCC is investing a considerable amount of money to improve the situation, with the net result that wastewater will be discharged less frequently than it has been in the past.

Mr Bourke advised that work currently underway will improve the ARI at all 22 sites to 2 years, or almost 2 years, by 2011. As a result of gradual degradation of the system however, the frequency of discharges at individual pumping stations may increase over time. CCC seeks that the 6-month ARI is provided for as a minimum, but expects that for most of the consent duration, discharge will be considerably less frequent than this at all pumping stations. Mr Bourke indicated that, at the present time, the average ARI across all sites for which consent is sought was four years.

Following our requests to provide detail on the reduction in frequency of spills over time, the applicant provided an amended condition set which requires a reduction in the total number of overflows from 8.4 per year for the Avon catchment (10 sites) at the start of the consent, to 4.9 in 2020; and from 14.2 spills per year across 10 sites in the Heathcote catchment, to 4.7 spills by 2020. While any individual site would still be authorised to discharge up to twice per year (6 month ARI), across each catchment the maximum number of spills would be fixed, as above. This equates, for the Avon catchment to an average of 0.8 spills per site each year now (ie. ARI of 1.25 years) to 0.45 spills per site per year (ARI of 2.2 years) in 2020. While the number of spills therefore currently exceeds that expected under the current consent (ARI 2 years for all sites by 2010), there is an ongoing reduction in the number of spills, and an average spill rate significantly less than the two per year per site feared by many submitters.

For the purposes of compliance with consent conditions, the overflow frequency will be calculated from the applicant's model, not from actual spill events, as these may be affected by unusual weather patterns. However, it is proposed that actual events will be compared to predicted events every three years and any discrepancies reported to ECan.

Volume of overflows

A number of submitters were concerned that, while the frequency of discharges may reduce, the volume and quality of the discharges was equally, or more, important. We considered this matter over the course of the hearing. Intuitively, if the frequency of discharges is decreasing due to upgrade works, then the total volume discharged will also be decreasing. It seems likely that the volume per spill would also decrease. As a result of discussion with submitters on this matter, the applicant confirmed that the model is capable of predicting the volumes discharged and proposed a condition requiring the total volume of wastewater to reduce at the same rate as the reduction in frequency of overflows in each catchment. We accept this as a useful addition to the conditions.

The actual rate and volume of each discharge will be measured, with the exception of discharges from PS11/1 and PS42/2, which are predicted to overflow only once every 20 years. The applicant advised that the flow rate was measured at each site using a calibrated weir to an accuracy of about +/- 10%.

Environment

We were reminded by both Mr Carranceja and Mr Murray that the environment that is relevant in considering this application is the environment that exists at the present time and in the future as it may exist as modified by permitted activities or the implementation of resource consents which have already been granted.

Both highlighted that the catchment is heavily urbanised and the receiving waters far from pristine. As we discuss later, other witnesses described the state of the rivers and estuary, a situation best described as degraded. The ecological communities are typical of those of degraded waters and the water contains high levels of faecal coliforms, primarily from dog and waterfowl faeces, which provides an existing health risk. The Ngai Tahu witnesses indicated the waterways and estuary are not used as mahinga kai (food sources) due to the high levels of contamination.

We note, however, the recent commissioning of the ocean outfall from the Bromley wastewater treatment plant and newspaper reports that the water quality of the estuary has improved already. The degree to which water quality of the estuary will improve will be limited however by the quality of the water inflows and the evidence was that stormwater is a more important factor in this than the wastewater overflows under consideration.

Effect on instream and estuarine ecosystems

The effects on the river and estuarine ecology was discussed in evidence by Dr Suren and Mr Brown respectively. Dr Suren had undertaken work in the Avon River specifically in regard to the proposal and also relied on a study undertaken by McMurtrie and Burdon[2] which investigated impacts on the Heathcote River.

In the Avon River, Dr Suren studied invertebrate and fish communities above and below wastewater overflow discharges at Fendalton Road Bridge, Dudley Creek (Slater St) and the Dudley Creek Diversion (Grassmere Street). We note here the confusion discussed earlier as to which pumping station on Dudley Creek actually overflows. The original presumption had been PS7/1, hence this was chosen as a study site. In fact, PS7/2 on Stapletons Road overflows before PS7/1. It was not indicated in the evidence how often PS7/1 overflows. As it may be infrequently, results from this site should be treated with caution.

Differences in community make-up above and below the outfalls was detected only at Grassmere St. However Dr Suren noted that there were habitat differences above the below the outfall (sunnier, more macrophytes below) that may explain the differences. He was unable to control for this habitat difference when undertaking sampling. Consequently, results from this site should also be treated with caution.

There were no differences between either density of biomass of fish upstream and downstream of any of the sites.

Dr Suren also analysed water quality data from above and below 10 wastewater overflows collected during overflow events. No significant differences were observed in the levels of dissolved reactive phosphorous or ammonia above or below any of the sites. Counts of *E. coli* were significantly higher at some sites than others and

[2] McMurtrie, S.A & Burdon, F, 2006. Ecological effects of sewage overflow events on the Heathcote River. EOS Ecology Report No. 05054-CCC05-01. EOS Ecology.

significantly higher below two outfalls compared to above. No difference in maximum counts of *E. coli* were detected above and below the sites.

Dr Suren commented that the lack of difference in both water quality and ecological parameters above and below the sites may be explained by the significant dilution (minimum dilution 1:11, median dilution 1:334 for the Avon and Heathcote Rivers; 1:16 minimum and 1:39 average dilution for a six month ARI for Dudley Creek).

The Heathcote study focussed on the short-term effects on invertebrate fauna five days after a sewage overflow at Locarno Street. Invertebrate community composition and density was compared at sites immediately upstream and downstream of the overflow, with a control site at Bowenvale Avenue, upstream of all known overflows. While some significant differences were found between sites, the authors considered there was little indication of long-term effects as a result of effluent discharges. The authors concluded that the fauna were already compromised and limited to taxa tolerant of organic pollution and silted habitats.

We accept the comments of Dr Suren in relation to the aquatic communities in the catchment. Urbanisation has resulted in significant siltation, bank modification, loss of native riparian vegetation, and inputs of stormwater to the rivers. Stormwater typically contains quantities of heavy metals, sediment, nutrients, organic compounds and pathogens. All these factors present significant stress on aquatic ecosystems, resulting in communities consisting only of tolerant taxa. Such taxa are far more able to cope with any effects on water quality or habitat resulting from the discharges.

Mr Brown, for the applicant, gave an overview of the ecological features of the estuary and the main findings from previous studies of contamination of estuary sediment. Nutrients and contaminants from stormwater can stimulate undesirable growth of plants and algae or be acutely toxic to aquatic species. Previous studies of sediments and shellfish have shown that parts of the estuary are moderately contaminated with heavy metals and organic compounds, although heavy metals were below levels where impacts to sediment-dwelling animals would be expected to occur.

Mr Brown advised that the wastewater discharges contribute to the mass loading of chemicals discharged to the rivers, however the contaminants of greatest concern, polcyclic aromatic hydrocarbons, zinc and dioxins predominantly enter waterways via stormwater runoff.

Consideration of the levels of contaminants likely to be present in the wastewater discharge showed that heavy metal concentrations did not exceed ANZECC guidelines for protection of 90% of species. Concentrations of nutrients did exceed ANZECC guidelines trigger values used to assess the nuisance growth of aquatic plants in estuaries. Mr Brown considered, however, that the level of dilution within the rivers and estuary, and the low frequency and short duration of discharge meant that nuisance growths would be unlikely.

Mr Brown compared the total mass loading of contaminants from the wastewater overflows to stormwater inputs and concluded the wastewater inputs were negligible compared to inputs from stormwater (mean mass load less than 1% of mass load from stormwater).

Two submitters commented on the ecological assessments undertaken. Mr Philip Ross was particularly concerned that the studies undertaken had not been designed to identify all potential effects, including those of industrial contaminants, immediate

impacts of discharge (as opposed to the longer term ecological health of the rivers), retention of contaminated material, for example on riverbanks or backwaters, and investigation of disease rates resulting from the discharge.

With regards to industrial waste, Mr Bourke advised that most industrial waste was contained within one sewer system (PS15, Alport), however overflows from this site were likely to be dominated by domestic sewage from the Sumner area. The applicant has proposed, in its final set of draft conditions, collection and assessment of the wastewater from three overflow sites, including heavy metal components, to characterise the discharge. We consider this is a reasonable approach. If the results indicate levels of heavy metals of concern, the review clause could be initiated to require further sampling and / or assessment of the effects of these contaminants. We suggest that one of the sites sampled should be PS15.

We also heard evidence from Dr John Lewis, a biochemist employed by Canterbury Health Laboratories, appearing in support of The Avon/Heathcote Estuary Trust. Dr Lewis' area of speciality is steroid hormones. He advised us that endogenous steroids released from municipal wastewater treatment plants are implicated as endocrine disruptors affecting gender differentiation and reproduction in aquatic species. Studies using wastewater effluents from sewage treatment plants have been shown to alter tissue histopathology in fish (for example causing oocytes in testicular tissue), which is of ecological concern. Sewage treatment usually results in a 90% loss of oestrogens during the treatment process, minimising the environmental effects. Dr Lewis's concern was that raw effluent was being discharged, which is likely to have higher concentrations of such steroids.

Mr Bourke advised us at that the dilution of the raw wastewater during an overflow event was likely to be approximately one in ten; that is, concentrations of contaminants would be diluted to 10% of their original concentration. If this is correct, this would mean that levels of steroids would be equivalent to those resulting from sewage treatment. Furthermore, considerable dilution, as discussed above, results once the wastewater enters the river.

We consider it unlikely therefore, that the discharge will result in any greater effects from steroid hormones than experienced from discharge of treated sewage from the treatment plant. Notwithstanding that treated wastewater is now discharged to sea and is subject to even greater dilution, while the untreated wastewater is ultimately discharged to the estuary, the relatively small quantities involved here mean the effect is not likely to be significant.

Overall, we consider that the effects on aquatic species are likely to be low. We note Mr Ross's comments about the lack of information on impacts during and immediately after a spill, but conclude from studies provided that even if short term impacts occur, the long term ecological health of the river is unlikely to be significantly affected. In conclusion we note, and agree with, a comment from the McMurtrie and Burdon report.

'…*while the input of sewage overflows during storm events will not be helping to improve the health of the Heathcote River, the invertebrate fauna is already so limited by other overarching constraints that the remaining species are most likely able to tolerate the sporadic overflow events*.'

Health effects

Health effects were of particular concern to many submitters. Dr Hudson, for the applicant, analysed water quality samples taken between 2006 and 2009, and showed that levels of faecal indicator organisms were such that recreation on the Avon and Heathcote carries a measurable risk of infection (> 5%) at all times, including during times of low flow. He considered that the rivers are generally unsuitable for contact recreation. Levels of faecal material was similar in these rivers to other Christchurch Rivers, such as the Styx and Otukaikino, that are not affected by sewage overflows. In the Avon, at least, a study by Moriarty and Gilpin[3] found that the main sources of faecal contamination were dog and duck faeces. Concentrations of enterococci in the estuary also indicate a measurable health risk (between 1 and >10% risk of gastrointestinal illness), although it is not clear how this situation will change with the re-routing of the wastewater outfall from Bromley to the ocean.

Dr Hudson carried out a quantitative Microbial Risk Assessment to determine the additional degree of risk resulting from wastewater overflows. The additional risk of infection to someone undertaking contact recreation downstream of an overflow site during a 2 year ARI storm event, ranged from less than 0.1% to 15%, assuming all sites were designed to a 6-month ARI standard. If all sites were designed to a 2 year ARI standard, the additional risk of infection during various storm events were measurably lower. The additional risk of infection at sites in the estuary during spill events were considerably lower (less than 0.1 %), however the risks to those eating shellfish gathered during a 2 year ARI storm event were as high as 4.5%.

While there is an increased risk to recreational users during a spill event as compared to a period of low flow, the likelihood of someone being in the water at the appropriate location must also be considered. This was covered in evidence by Mr Cliff Tipler. He pointed out that the risk to the community is significantly less than discussed above as few people in the community would be likely to undertake contact recreation in the circumstances likely to result in wastewater overflows. Mr Tippler estimated the probability of such an event occurring, but since his figures were based entirely on conjecture, we will not consider them further, except to say that we accept the risk across the community will be far lower than predicted by the QMRA.

However, that is not to say that we consider there is no risk to the community. It is not impossible that someone may be kayaking during high flows. Spills may continue for a short time once the rain has stopped.

We were also interested in the risk to non-contact recreationalists as a result of material deposited along the riverbank, for example walkers, particularly those with dogs, children playing on the riverbank and householders whose gardens flood. This was not specifically assessed by Mr Hudson. In response to a question he considered that the risk from such sources was lower, as bacteria are inactivated by desiccation or exposure to UV radiation. However, we heard from both Dr Humphrey and Mr Ross that some pathogens can persist for very long times in the environment. Dr Humphrey in his submission specifically mentioned the risk of transmitting infection from dogs which had been exposed to pathogens by swimming or picking up material from the riverbank.

[3] Moriaty, E., Gilpin B., 2009. Faecal source tracking in the Avon river, Christchurch March – May 2009.

As Dr Humphrey (Medical Officer of Health) pointed out, the prevalence of infection from contaminated water is unknown, due to non-reporting of many gastrointestinal infections. Where infection is reported, determining the source is often impossible. While some submitters gave anecdotal accounts of illness following exposure to river water, we cannot say whether wastewater overflows are responsible for any of these.

Overall, however, while we accept there is an existing risk of infection from Christchurch's waterways in the absence of wastewater overflows, we conclude that the overflows do result in a small increased risk of infection for people engaged in water contact activities, and this risk increases with a lower ARI standard (ie 6 monthly rather than 2 years). The risk to the other group of potentially affected people - riverbank users - is likely to be less but there are more of them. In the absence of any evidence (and that is not a criticism of anyone) we can only speculate on the likelihood of infection from walking through areas which have recently been flooded or touching dogs that have been in the river or in contact with the riverbank.

Notices warning of pollution are erected close to overflows during spillage events. We consider that more could be done to warn rivers users at commonly used access points downstream of overflow sites.

Several submitters sought that the media were informed when a spill had commenced. The applicant rejected this suggestion on the basis that the Medical Officer of Health was informed when a spill occurred and he was the expert in determining whether health effects were likely and whether a press release should be issued. He had not done so to date. We agree that this decision should be left to the experts. While there is public interest in spills, we do not think there should be a requirement for the applicant to provide media releases. Public warning signs are posted and water user groups are informed so those in the vicinity or potentially using the water are aware of the risk. We suspect that, given the level of interest, the media will make it their business to seek information on spills in times of heavy rain.

Cultural effects

We heard from Mr Higgins that the Avon (Otakaroro/Otakaro) / Heathcote (Opawaho) areas were originally food-rich wetlands, outposts supplying food to the main pa at Kaiapoi. They were highly regarded mahika kai. The rivers and estuary (Te Ihutai) supported a number of specific food gathering sites where plants, birds and fish were gathered. Vegetables were cultivated near the mouth of the Otakaro.

Mr Te Aika described the significant degradation of the mauri (life essence) of the Otakaro and Opawaho, to which the overflow discharges have contributed. The presence of raw sewage affects both the tangible (eg life-supporting capacity, fitness for cultural use, aesthetic qualities) and the intangible features of the rivers. We heard it is not possible to mitigate the discharge of sewage into freshwater, as it is completely in conflict with Kai Tahu values. As takata whenua see themselves as one with the natural resources, desecration of the mauri of a waterway is also a direct affront to the people themselves.

Mr Te Aika also described the importance of mahika kai to the social fabric of Maori life. The loss of access to traditional mahika kai and the widespread degradation of water quality over the past 150 years has had a profound impact on the wellbeing of Kai Tahu whanui.

Kai Tahu accord special value to Otakaro, Opawaho and Te Ihutai, as water bodies that provide significant habitats for food species and material, provide breeding and migratory environments and have long-standing use by Maori. Kai tahu has a long term goal of restoring these water bodies so they can sustain mahika kai again. Mr Te Aika tabled copies of a cultural health impact assessment of the Te Ihutai estuary carried out in 2007. The estuary was found to be in a state of poor to very poor cultural health. The impacts of historic and ongoing drainage, discharge of untreated stormwater, loss of native vegetation and reduced water quantity within the catchment were identified as major issues influencing the assessment. Water quality monitoring showed faecal contamination from human and agricultural sources, and while native fish were present, the health of the waterways was not considered good enough to harvest them. Mr Te Aika explained that even if the rivers and estuary are able to support traditional mahika kai species, the discharge of raw sewage renders them unfit for use.

Te Runanga o Ngai Tahu does not oppose the application, as it accepts the need for the discharges in the short term at least. Mr Horgan emphasised that improvement to the situation is essential. The more frequent the overflow events the more frequent the affront to cultural values. The cultural impact assessment undertaken recommended prioritising the upgrade of a number of sites, considered to be either the worst quality or more culturally significant sites, and rejected the increased frequency of discharges applied for. Having read the Investigating Officer's report, Mr Horgan supported the recommendation of a gradual increase in the frequency of discharge at all sites.

Mr Horgan referred us to a recent Environment Court decision, *Te Maru o Ngati Rangiwewehi v Rotorua District Council (A95/08)*. The case has similarities with this application: a replacement consent by the District Council for a municipal activity, in that case municipal water supply, with significant impact on tangata whenua values (the abstraction was from a significant spring). The activity began initially at a time when the non-Maori world did not acknowledge the importance of Maori culture to Maori people.

The Court was clear that the sections of the RMA dealing with Maori culture must be given effect to, words of acknowledgement were not enough. Where desecration continued, those responsible were required by statute to a commitment, where reasonably practicable, to put an end to that desecration.

We find that the effects on tangata whenua values and on tangata whenua's relationship with its culture and traditions are significant and are ongoing. While we accept the applicant's evidence that complete cessation of discharges is simply not possible in the foreseeable future, an ongoing reduction in the number of discharges is possible and will reduce the effects on Maori. As Mr Horgan stated, the more frequent the overflow events, the more frequent the affront to cultural values.

The reduction in frequency for the majority of the overflows proposed by CCC will reduce the level of effect on Ngai Tahu, and will get a step closer to the complete cessation that they seek and that is necessary to avoid adverse effects on them. The Cultural Impact Assessment identified a number of sites that were identified as being the 'worst quality, significant sites', which Ngai Tahu sought to be prioritised for upgrade. The proposed consent conditions requiring a reduction in total frequency of spills across the catchment will not specifically address the discharges at these individual sites. Mr Bourke identified that all the sites that Ngai Tahu had requested to be prioritised within the next five years would be upgraded within that time, with the exception of Pages Road.

In conclusion, we note Mr Higgins' comment: *'We have aspirations to see the health of Otakaroro, Opawaho and Te Ihutai improve significantly, including the restoration of healthy populations of native birds, plants and fish. This current application to wilfully pollute the life blood of the city is only continuing to show us that not much has changed. We expect better.'*

Social and amenity effects and public expectations

The idea that raw sewage is discharged into the rivers is also abhorrent to many non-Maori. Almost all submitters considered the discharge of untreated wastewater to the waterways to be unacceptable. Expressions such as 'disgusting', 'shameful', 'fundamentally abhorrent', 'third world standards' and '18th century' were used.

Submitters highlighted the recreational and amenity values of the rivers and estuary, their use for kayaking, boating and walking and the potential effect on tourism to the city.

We had several discussions with Mr Carranceja during the course of the hearing about public attitudes towards the discharge and the extent that we could consider them as effects. Mr Carranceja considered that we could not give any weight to mere perceptions, we can only consider actual or potential effects. We agree that we cannot simply consider a dislike of something without considering whether the alleged effect really exists.

Many submitters commented that they reside close to the river and/or use the river environs for walking, kayaking or boating. Some live in areas such as the Beckenham Loop that are regularly flooded during high rainfall events. We consider there is a potential effect on these people as the knowledge that spills occur may affect their use and enjoyment of the river. The spills themselves may possibly affect their health.

The public, as clearly expressed in submissions, expects the situation to improve. It is strongly opposed to the potential increase in frequency of spills applied for. Many submitters considered it acceptable only if it is for a short duration while work is undertaken to improve the situation. There is a general desire within the community to improve the health and cleanliness of our waterways. This is evidenced in many ways, for example the pressure on the farming community to keep stock out of waterways and higher standards set for new stormwater systems.

The public's expectation that sewage discharges will cease completely will not be met in the short term, however the conditions proposed by the applicant ensure that for most sites, the situation will improve markedly from what has occurred in recent years.

Effect on Case family land

The Case family submitted that the proposed increase in discharges applied for may exacerbate flooding and result in contamination of their land, located at Cranford Street. The land is currently used for market gardening, but the owners are pursuing re-zoning for urban use, initially through a pending appeal seeking inclusion within the urban limits defined in Proposed Change 1 to the Regional Policy Statement. Flooding occurs on average twice per year.

Mr Bourke indicated that installation of a storage tank at PS1/21 (Grassmere St) was planned. Once completed, the ARI for the pumping station would be 2 years. The installation had been delayed and was now not programmed until 2017/18 in the CCC's Long Term Council Community Plan. The reason given was that the work on the Western Interceptor and Fendalton Duplication currently underway would relieve pressure on the Grassmere sewer.

While we cannot concern ourselves with the matter of existing flooding (a matter currently before the High Court), contamination of the land and any additional flooding as a result of the discharge is relevant. Mr Prain was concerned that if the High Court find in favour of the Case family that the flooding is illegal, we may have in the meantime granted a consent that allows the continued discharge of sewage onto the land for up to 25 years. We state clearly here that the application is not for discharge of sewage onto land, but for discharge into the Dudley Creek. If flooding from the creek onto the land is required to cease, then any overflow of stormwater containing sewage onto the land must also cease.

While we accept the Case family's position that the proposed reduction in average discharges across the catchment will not necessarily mean a reduction at any particular discharge point, and that in theory discharges could continue to occur twice yearly at Grassmere Street, we heard from Mr Bourke that the Grassmere Street overflow is at a low point in the system. Attempting to prevent overflows here would result in overflows immediately upstream and downstream of the pumping station. We are satisfied that the number of discharges will reduce in the short-term by works underway and in the long term by the proposed storage tank. If the flooding is found to be illegal, then all overflows, including any containing raw sewage, will be required to cease, avoiding contamination of the land.

Liaison group

Following consultation with Ngai Tahu, the applicant has proposed to form a Compliance and Monitoring Liaison Group, consisting of representatives of CCC, Ngai Tahu, Environment Canterbury, the Avon-Heathcote Estuary Trust, the Christchurch Estuary Association, Beckenham Residents Association and Community and Public Health. We consider this forum will be useful and will allow better information dissemination to the community, a matter that we suspect may have been poorly handled in the past.

It is proposed that the group will meet at least annually to be updated on capital and maintenance works completed and planned, development of the computer model, any new technologies in wastewater overflow reduction or prevention, and compliance and monitoring results.

Screening

The need for and feasibility of screening the outfalls was a matter we considered at some length. The previous consent required fish screens to be installed to prevent fish entering the sewer. This condition was not complied with.

As we understand it, the applicant's concern with screens is that unless they are mechanically cleaned, blockage will prevent or reduce managed spills and cause pressure to build up, resulting in overflows elsewhere in the system.

Mr Bourke considered that relatively few solids would be discharged as heavier solids would tend to remain in the pipe and floatable material would get trapped in

the manholes. (We note the inconsistency between these comments and the concern that screens would block up.) Mr Bourke stated that there was seldom any visible evidence of solids resulting from an overflow in wet weather conditions.

Mr Bourke accepted that screening was achieved elsewhere in the world. Mr Apperley considered there were one or two sites where screening might be practical. He suggested a condition requiring further investigation into the use of screens, with the results to be taken to the liaison group.

Given the evidence we have heard, requiring screening at all sites would probably be unachievable. We accept that further investigation is a practical approach, noting that it is our preference that ultimately as many sites as possible are screened, focussing particularly on the largest and those that spill most frequently. To this end, we are including a review clause that can be used to require screening if it is shown to be practical.

Monitoring

The applicant has proposed water quality monitoring to be undertaken during each event, within 100 m upstream of the discharge (or group of discharges) and within 200 m downstream. Sampling is to occur within 10 hours of the spill beginning or as soon as daylight permits. Samples are to be tested for *E. coli* only, with the exception of the first three overflows, which are also to be tested for suspended solids, biological oxygen demand, heavy metals, dissolved reactive phosphorous, ammonia and faecal coliforms, as discussed earlier. The *E. coli* measurements are used to determine when to cease sampling and when warning signs can be removed.

In general, we agree with the sampling programme proposed. We consider, however that sampling should be specifically undertaken at the nearest public point of access to the river downstream of the overflow, provided this is less than 200 m downstream.

Several submitters sought changes to the monitoring programme, particularly sampling of the discharge immediately adjacent to the discharge point, sampling ammonia concentrations, sampling as soon as practicable after discharge starts, rather than up to 10 hours later as proposed, and sampling below individual sites that are close together, rather than sampling above and below them as a group.

We discussed these matters with Mr Bourke. He considered that sampling adjacent to the point of discharge is unnecessary as the quality of the discharge in general is already well known from previous sampling. It does not vary greatly. He also considered that there was no particular need to sample at the beginning of a spill – sampling at the end to determine when water quality had improved sufficiently to remove warning signs was far more important. A delay of up to 10 hours, which was provided for safety reasons to allow sampling during daylight hours, was of no consequence.

We largely agree with Mr Bourke. A delay of up to 10 hours is not, in our minds, an issue. Safety of the operator is more important. Sampling at the discharge site for the routine monitoring of *E. coli* is unnecessary, as it is the concentration in the water after reasonable mixing that is important. However, for the three more detailed investigative samples it is important that these are taken at the discharge point, since the purpose is to characterise the discharge, allowing further targeted monitoring of the downstream environment if necessary.

Data from on ammonia concentrations from existing spills was presented in the application. Concentrations appear relatively consistent at the sites measured and are typically less than 0.2 mg/l. The one exception is the Slater Street overflow (PS7/1) where concentrations as high as 0.9 mg/l have been recorded, but *upstream* of the overflows. Whether this derived from an unmonitored spill upstream we can only speculate. Concentrations downstream of the overflow site were slightly lower. For comparison, the ANZECC 2002 trigger value for 95% protection of species is 0.9 mg/l at a pH of 8 and 20^{o}c; trigger values at lower pHs and temperatures are higher. Given the relatively low dilution in Dudley Creek, we consider it worthwhile continuing to measure ammonia concentrations in this sub-catchment. If it is confirmed that there is no problem with the discharges, the applicant could apply to cease monitoring.

With regards to sampling above and below a group of sites, we see little benefit in sampling above and below individual sites that are closely grouped. However, the 5 km distance between sites specified in the proposed conditions appears to us too great a distance. There would be significant dilution of contaminants between two sites spaced 5 km apart. The measurements are relied on to determine when to remove warning notices and the effects at sites such a distance apart should be considered separately. We therefore propose to reduce the distance to 2.5 km. This would generally mean only closely grouped sites in the Beckenham Loop area, on Linwood Avenue Canal or Dudley Creek would be considered together if they spill at the same time.

We have considered whether there should also be some sampling of riparian areas that have been flooded with water containing wastewater overflow. Contact with these areas has been identified as a possible danger to health, however we see this an something needing research, rather than something requiring regular monitoring. We have imposed a condition requiring some investigation, which will be reported back to the Compliance and Monitoring Liaison Group.

5.2 Section 104

Section 104(1) requires that, subject to Part II of the Act, we must have regard to:

- *(a) any actual or potential effects on the environment of allowing the activity; and*
- *(b) any relevant provisions of*
  - *(i) a national policy statement*
  - *(ii) a New Zealand Coastal Policy Statement;*
  - *(iii) a regional policy statement or proposed regional policy statement;*
  - *(iv) a plan or proposed plan; and*
- *(c) any other matter the consent authority considers relevant or reasonably necessary to determine the application.*

There are no relevant operative national policy statements although there is a proposed National Policy Statement for Freshwater Management. This is considered under s104(c). The New Zealand Coastal Policy Statement does not apply.

5.2.1 Section 104(1)(a) - Actual and Potential Effects

These have been discussed above.

5.2.2 Section 104(1)(b) - Policy Statements and Regional Plans

Regional Policy Statement

Both the Investigating Officer and Mr Murray summarised relevant objectives and policies of the Regional Policy Statement (RPS). With regard to Chapter 5 (Matters of resource management significance to tangata whenua), both refer to the unacceptability to Maori of discharges of human effluent into water bodies.

Chapter 9 of the RPS is concerned with water quality. Objective 3 and Policy 9 are relevant. They seek to safeguard sources of drinking water, maintain and enhance amenity values, and avoid, remedy and mitigate the adverse effects of discharges on water quality.

Mr Murray argued that the application is not inconsistent with the RPS, except to the extent that the discharges are offensive to Maori and affect their relationship with their culture and traditions. This conclusion is based on the fact that the discharges are intermittent and heavily diluted, the receiving environment is degraded and there has been shown to be minor or negligible effects on ecological values.

Policy 9 seeks the maintenance and where appropriate, enhancement of amenity values. As discussed above, we consider there are effects on amenity values, a potential effect on the health and safety of the community, and the discharges contribute, along with stormwater and run-off, to effects on mahinga kai and the life supporting capacity of the water. The fact that the rivers are already degraded is not justification for continuing to add further contaminants. Efforts must be made to improve the situation.

Transitional Regional Plan

We consider there is nothing in the Transitional Regional Plan which is relevant to this decision.

Proposed Natural Resources Regional Plan

Mr Murray argued that little weight should be given to the Proposed Natural Resources Plan (PNRRP), particularly to Policy WQL2, as changes were highly likely as a result of the submission process. We are required to consider the plan provisions as they stand at this time, however we agree that changes may result, and therefore that full weight is not appropriate.

Objective WQL1.1 (Chapter 4) sets overall goals for river water quality. Water quality is to be maintained or improved so that it provides for various values, including contact recreation in reaches valued for that purpose, amenity values and Ngai Tahu cultural values, including mahinga kai.

Water quality is also to be improved so that various stated parameters, primarily relating to the growth of aquatic plants and algae, are met. We are unclear as to the extent that the discharges contribute to algal growth in the rivers, but note data provided by Mr Brown showed that nutrient concentrations in the rivers resulting from sewage overflows are relatively high and exceed the ANZECC trigger for nuisance

growth of aquatic plants in estuaries. (No equivalent trigger for nuisance growth in rivers was provided).

Policy WQL2 prohibits the point source discharge of untreated human sewage. This is reflected in Rule WQL15. Policy WQL2(2) further requires that a community sewage system has in place effective measures to prevent effluent discharging to surface water in the event of system failure or overloading. The proposed discharges are clearly contrary to these policies.

Given the evidence we have heard about the practicality of ceasing discharges completely, and the likelihood that this policy will be amended, we do not consider that it is appropriate or necessary to decline the application based on non-compliance with this policy. However, the thrust of all relevant planning documents, including the proposed National Policy Statement discussed below, is for the maintenance or improvement of water quality. In relation to these applications, this can only be achieved by reducing the discharge events as much as practicable.

5.2.3 s104(1)(c) Any other matters

Proposed National Policy Statement for Freshwater Management

The Proposed National Policy Statement for Freshwater Management outlines objectives and policies for the management of freshwater resources as a matter of national significance. We particularly note Objective 3:

'*To ensure the progressive enhancement of the overall quality of Freshwater Resources, including actions to ensure appropriate Freshwater Resources can reach or exceed a swimmable standard*.'

and Objective 5:

'*To control the effects of Land-use Development and discharges of contaminants to avoid further degradation of Freshwater Resources*.'

Policy 6 relates to resource consents, and states that the Policy Statement will be achieved by including (unless inappropriate) conditions on resource consents in respect of:

(b) Protection against degradation of the quality of Freshwater Resources…

The above provisions reflect our strong conviction that the existing situation should be improved over time.

Te Runanga o Ngai Tahu Freshwater Policy

The Te Runanga o Ngai Tahu Freshwater Policy further reinforces the unacceptability of the discharges through its strategy that councils should prohibit the direct discharge of contaminants, particularly human effluent, to waterways, in order to meet Ngai Tahu's objective to restore, maintain and protect the mauri of freshwater resources.

5.3 Section 105

Section 105 specifies further matters that the consent authority must have regard to when considering applications for discharge permits. These are:

> *a) the nature of the discharge and the sensitivity of the receiving environment to adverse effects; and*
> *b) the applicant's reasons for the proposed choice; and*
> *c) any possible alternative methods of discharge, including discharge into any other receiving environment.*

The potential effects of the discharge and the reasons for it are discussed above. We have heard evidence that the receiving environment is degraded, and therefore insensitive to these discharges. The applicant's reasons for the discharges and the lack of suitable alternatives are also discussed above.

5.4 Section 107

Section 107 sets restrictions on the granting of discharge permits that would give rise to certain effects. We have some concerns about the discharge of floatable or suspended materials. Mr Bourke argued that floatable material becomes trapped in the manholes, although we doubt that all debris is trapped in this way.

We consider that while floatable material is almost certainly discharged, it is likely to be intermittent, and be discharged into a fast flowing waterway that is carrying other suspended material. We consider that after reasonable mixing it is likely to be inconspicuous. We conclude that the discharge complies with s17.

6 PART II OF THE RESOURCE MANAGEMENT ACT 1991

The purpose of the Act is to promote the sustainable management of natural and physical resources. Sustainable management involves 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 well-being and for their health and safety.

However, the Act promotes the use and development of natural resources only while (s5):

> *(a) sustaining the potential of natural and physical resources … 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.*

Allowing ongoing discharges will allow the local community to provide for its social and economic wellbeing and its health and safety, by avoiding uncontrolled spills of raw sewage into streets and private properties. Preventing discharges completely is not feasible economically. There are adverse effects associated with the discharges, particularly the effect on the cultural values, which can be mitigated only to the extent of them being reduced in frequency. We strongly believe, as do many submitters, that the discharges should reduce over time. This should allow, particularly in

association with other projects to improve stormwater quality, a gradual improvement in the water quality of the two rivers and the estuary. The conditions proposed by the applicant require an improvement in discharge frequency for most sites. Ultimately, the average frequency for discharges across all sites will be slightly less than the 2 year ARI allowed under the existing consent.

Sections 6 and 7

Relevant section 6 matters include the preservation of the natural character of rivers and their margins and the protection of them from inappropriate use and development. We accept Mr Murray's position that the discharges themselves are only one factor of many affecting the natural character of the rivers. The catchment is highly urbanised and the rivers are currently degraded in terms of water quality and natural environment.

A number of matters in Section 7 are relevant. Section 7(b) *the efficient use and development of natural resources*, is relevant in regards to the cost of upgrading the system. We accept the applicant's position that improvements to the point where no discharges occur would not be an efficient use of resources. The effects on amenity, ecological and cultural values are discussed above.

Section 8

Section 8 requires us to take into account the principles of the Treaty of Waitangi. We have considered the evidence presented by the Ngai Tahu witnesses and the cultural impact statement prepared. Ngai Tahu has taken a pragmatic approach to the application, accepting the need for ongoing spills but seeking an improvement over time and a 10 year duration.

Overall, we consider that granting these applications, with the conditions proposed, will achieve the overall purpose of the Act.

8 DURATION

The applicant is seeking a duration of 25 years on the basis that the effects will be less than minor, there is unlikely to be any improvement to background water quality over the next 25 years that would change the relative effects associated with a 6-month ARI, significant upgrade work is proposed and a review condition is volunteered.

Many submitters sought a short duration, in some cases significantly shorter. However, these submissions are likely to have been made on the understanding that discharges would increase from the current situation. As discussed above, that is not actually what the CCC intends. We appreciate that the consent has to provide for some worsening of the ARI of overflow for some pumping stations because upgrading is carried out in steps, not small incremental improvements, but it was unnecessary to apply for all 22 pumping stations to overflow as frequently as once every 6 months. We indicated in the course of the hearing, particularly on the 18th May when the hearing became more of a technical discussion, that the conditions of consent should reflect the CCC's stated intention of steady and significant overall improvement. It appears that the best way to specify improvement is to control the number of overflows per year, rather than the average ARIs or total volumes discharged. The applicant has now proposed conditions requiring a decrease in the

number overflows over time, resulting in an average ARI significantly greater than 6 months.

The Ngai Tahu submitters sought a 10 year duration so that the question of whether consent is appropriate can be re-considered in no more than 10 years time. Mr Horgan expressed the view that this is necessary because *"..frequent and persistent non-compliance by the Council with the conditions of its existing consent...means this is not a situation where we can rely on variations and reviews of conditions to work towards a meaningful reduction in overflow events."*

Mr Apperley recommended a minimum of 15 years to provide certainty for programming and financial provision for large capital expenditure.

We have considered the various points of view. Our conclusions on this are split. One of our panel considers a duration of 5 years to be appropriate. In their view, it is not acceptable to discharge sewage to waterways, and it is obvious that the people of Christchurch are not prepared to have this continue for any length of time. While accepting that Council needs to take into consideration costs and cost effectiveness, there is concern that this has been over-emphasised. Complete cessation of discharges in five years may be difficult to achieve but a firm signal needs to be sent that the situation must be improved.

The remaining panel members consider that a time frame of anything less than 10 years is not appropriate as the Council needs certainty for forward financial planning. The Council is making significant capital expenditure to improve the situation and this should not be disregarded. The conditions imposed will ensure that in each catchment spills decrease significantly over time and considered across all sites there will be significantly less than the two spills per year per site initially applied for.

However, we also consider that 25 years is too long. Within this time there are likely to be changes to planning documents, which set the framework against which the discharges should be considered, to public opinion on water quality matters - we suspect that improvements will continue to be sought, and to technology, to reduce discharges in a more cost effective manner. It is possible that water quality within the catchment will improve as a result of other initiatives, including in the estuary as a result of the ocean outfall. Assumptions built into the model about the City's growth, rainfall, rate of deterioration of pipes etc. may prove to be false and will be revised over time, improving the accuracy of the model outputs.

We note that the previous consent application significantly under-estimated the cost of the improvements necessary to achieve the 2 year ARI sought, meaning the conditions were unachievable. While we have more confidence that the predictions made now, based on an updated model, are more realistic, this is also a factor we have considered in determining the duration.

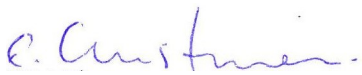
Overall we consider 15 years provides a balance between keeping the matter fresh in the mind of the Council and allowing the changes discussed above to be taken into account, while allowing the City Council a reasonable duration for planning purposes.

9 DECISION

For the reasons discussed above, we grant the application CRC092692, to discharge groundwater, wastewater and stormwater into the Avon and Heathcote Rivers and

tributaries, and into drains entering the Avon-Heathcote Estuary, subject to the conditions set out in Annexure 1 below, for a duration of 15 years.

DATED the 20 day of July 2010



Emma Christmas

on behalf

David W Collins, Chair of Hearing Panel
Terry Scott

Annexure 1 – Conditions of Resource Consent

General

(1) The contaminants discharged shall only be stormwater, groundwater and wastewater from the Christchurch City Council wastewater network.

(2) The discharges shall only occur as a result of wet weather events overloading the wastewater network.

(3) The discharges shall only occur at the overflow locations identified in Schedule 1 of this consent.

(4) For the purposes of this consent, an 'overflow event' at each location may consist of one or more discharges and shall only be deemed to have commenced when there has been no prior discharge at that location for a period of 24 hours.

Frequency of Overflow Events

(5) (a) The annual overflow event frequency, as calculated in accordance with Condition (7), shall be as follows:

(i) The total annual overflow event frequency calculated across the 10 overflow sites in the Avon River catchment, as identified in Schedule 1, shall be no more than 8.4 at the commencement of this consent, improving to: no more than 7 by 2015, no more than 4.9 by 2020 and no more than 4.77 by 2025;

(ii) The total annual overflow event frequency calculated across the 10 overflow sites in the Heathcote River catchment, as identified in Schedule 1, shall be no more than 14.2 at the commencement of this consent, improving to: no more than 8 by 2015, no more than 4.7 by 2020, and no more than 4.63 by 2035;

(iii) The total annual overflow event frequency calculated across the 2 overflow sites in the Avon-Heathcote Estuary, as identified in Schedule 1, shall be no more than 0.86 at the commencement of this consent, no more than 0.87 by 2015, no more than 0.88 by 2020, and no more than 0.92 by 2025.

(b) Each individual site in Schedule 1 shall achieve an annual overflow event frequency of no more than two by the date specified in Schedule 1.

Volume of overflows

(6) The total volume of wastewater overflowing into each of the Avon and Heathcote rivers and Avon-Heathcote Estuary, as calculated in accordance with Condition (7), shall reduce by the same proportion as the reduction in frequency of discharge under Condition 5, between the commencement of the consent and 2025.

Use of Computer Model to Determine Average Recurrence Interval Compliance

(7) For the purposes of determining compliance with Condition (5) and Condition (6), the overflow frequency shall be calculated using a field-calibrated computer model which predicts the annual average number of overflow events and total overflow volumes into the Avon and Heathcote Rivers and the Avon-Heathcote Estuary. The model shall use a long-term time series methodology to assess current system

performance against actual rainfall records. The period of actual rainfall to be analysed shall be of 25 years duration and the period end shall be less than three years from the date of the analysis being undertaken.

Monitoring

(8) Within 3 months of the date of commencement of this consent, automatic monitoring and alarm systems shall be provided and thereafter maintained operational at each overflow location which the field calibrated computer model identifies as overflowing more than once in every 3 years .

(9) At each monitored overflow location the following shall be monitored:

(a) Start date and time of overflow event
(b) End date and time of overflow event
(c) Peak flow rate during overflow event
(d) Total volume discharged during overflow event.

(10) Water quality sampling shall be undertaken as follows:

(a) Location – Multiple Discharges. Where multiple overflow discharges occur simultaneously within any 2.5 km stretch of river or estuary, samples shall be obtained:

(i) Within 200 metres downstream of the point of the most downstream discharge, as far as practicable at a commonly used access point to the river or estuary; and

(ii) Within 100 metres upstream of the point of the most upstream discharge.

(b) Location – Single Discharges. Where (9)(a) does not apply, samples shall be obtained, with respect to each overflow location:

(i) Within 200 metres downstream of the point of discharge, as far as practicable at a commonly used access point to the river or estuary; and

(ii) Within 100 metres upstream of the point of discharge, and

(iii) Where the sampling is in accordance with condition (10)(c)(i), directly in the discharge plume within 10 metres downstream of the point of discharge.

(c) Parameters

(i) Three overflow events subject to this consent shall be sampled for the following parameters: suspended solids, BOD, zinc, copper, lead, dissolved reactive phosphorous, ammonia, faecal coliforms, and ***E. Coli***. The events sampled shall be the first overflow event from PS15 (Alport), the first overflow event into the Avon River and the first overflow event into Dudley Creek, following the commencement of consent.

(ii) Samples from all overflow events except those discharging into Dudley Creek shall thereafter be tested for ***E. Coli***.

(iii) Samples from overflow events discharging into Dudley Creek shall thereafter be tested for ***E. coli*** and ammonia.

(d) Timing and Frequency

(i) Sampling shall occur within 10 hours of receiving notification from the automated alarm system that an overflow is occurring or as soon thereafter as daylight permits.

(ii) Sampling is to be repeated once daily until the ***E. Coli*** concentration of the downstream sample is less than 2 times the ***E. Coli*** concentration of the upstream sample, and then for one more day.

(e) Sampling shall be undertaken by a person(s) trained to IANZ accredited or equivalent standards.

(f) Missed Samples. Where for health and safety reasons any water samples cannot be obtained, or the timeframe does not meet condition (10)(d)(i), these reasons shall be recorded.

(g) Testing shall be carried out by an IANZ accredited laboratory.

Compliance and Monitoring Liaison Group

(11) (a) A Compliance and Monitoring Liaison Group shall be formed by the consent holder and meetings convened at least once annually.

(b) The following organisations shall be invited to have up to two representatives on the Compliance and Monitoring Liaison Group: Christchurch City Council, Environment Canterbury, Te Runanga o Ngai Tahu, the Avon-Heathcote Estuary Ihutai Trust, Beckenham Neighbourhood Association, the Christchurch Estuary Association, the Combined Christchurch Residents Association and Community and Public Health.

(12) The Compliance and Monitoring Liaison Group shall at each meeting be updated by the consent holder on matters relating to the exercise of this consent, including but not limited to:

(a) Relevant capital and maintenance works completed in the past year and currently programmed by the consent holder;

(b) Development and refinement of the computer model;

(c) Any new technologies in wastewater overflow reduction or prevention measures; and

(d) Compliance and monitoring results in accordance with Condition 16.

Compliance and Monitoring Reporting

(13) Commencing in 2011, a report shall be submitted to Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, by 31 August each year addressing the following matters:

(a) A full record of overflow events for the year ending 30 June. At minimum this shall include the parameters required by Condition (9).

(b) Any capital and maintenance works undertaken in the previous financial year to maintain compliance with Conditions (5) and (6).

(c) The capital and maintenance works identified in the Annual Plan, Long Term Council Community Plan, and any other relevant statutory document, to ensure ongoing compliance with Conditions (5) and (6).

(d) Water quality sampling results in accordance with Condition (10) including the locations from which samples were taken.

(e) Minutes of the meeting(s) held by the Compliance and Monitoring Liaison Group under Condition (11).

(14) By 31 August of the third full year from the date of commencement of this consent, and thereafter by 31 August every third year, a report shall be submitted to Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, addressing the following matters:

(a) The current modelled annual overflow event frequency at each overflow location.

(b) An independent peer review report of the current modelled results, carried out at the consent holder's cost, commenting on the confidence that may be had in the results, and recommendations for improving confidence if appropriate. Peer review to include consideration of the following:

(i) Infrastructure data (pipes, manholes, weirs, and pump stations)
(ii) Catchment delineation and connections
(iii) Dry and wet weather flow parameters
(iv) Rainfall records
(v) Verification and error checking procedures and outcomes
(vi) Known errors, omissions or inaccuracies

(c) A comparison between the modelled annual overflow event frequencies and volumes and the recorded overflow event frequencies and volumes in the previous reporting period, including an explanation of any discrepancies.

(d) The current modelled total volume of wastewater overflowing into each of the Avon and Heathcote rivers and the Avon-Heathcote Estuary.

(15) By 31 August of the third full year from the date of commencement of this consent, and thereafter by 31 August every sixth year, a report shall be submitted to Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, containing:

(a) an assessment by a suitably qualified person(s) of the human health and ecological effects arising from any overflow events in the previous reporting period.

(b) a Cultural Health Assessment, by a person(s) recommended by Te Runanga o Ngai Tahu, and commissioned by the consent holder, which assesses the effects of the overflows on tangata whenua values, including the state of the mahinga kai species and their habitat, and mauri.

(16) Copies of the reports prepared under Conditions 13-15 shall be provided, at the same time as submission to Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager, to the members of the Compliance and Monitoring Liaison Group.

Response Plan

(17) The Consent Holder shall maintain and comply with a current Sewer Overflow Response Plan setting out the procedures relating to an overflow event. The Response Plan shall include, but not be limited to, the following matters:

(a) Notification of the Canterbury Medical Officer of Health within 1 hour of the receipt of information relating to an overflow event.

(b) Identification of parties potentially affected by overflow events.

(c) Methodology for sampling of overflow events in accordance with Condition (10).

(d) Notification of any discharge to the potentially affected parties identified in condition (17)(b). The consent holder shall undertake all reasonable endeavours to notify potentially affected parties by fax or phone within 6 hours of the receipt of information relating to an overflow event, unless any party requests an alternative arrangement and this is agreed to by the consent holder.

(e) Public health warning signs shall be erected at the following locations:

(i) the overflow site

(ii) at a maximum of 200 metre intervals on both banks for at least 600 metres downstream of those locations for any sites that are or are known to have been discharging, ensuring that wherever practicable, signs are located at commonly used access points to the waterway.

These signs shall only be removed when water quality sampling has ceased in accordance with Condition (10)(d)(ii).

(f) At least twice a day during an overflow discharge and on the day following an overflow, waterway banks shall be inspected for a minimum distance of 600 metres downstream of the overflow, and any objectionable material relating to the exercise of this consent shall be removed.

(g) A copy of the most recent Sewer Overflow Response Plan shall be provided to Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager and the Canterbury Medical Officer of Health annually on 31 August.

Investigation into screening

(18) (a) Within 18 months of the commencement of this consent, the consent holder shall undertake an investigation into the feasibility of screening each overflow site to reduce or prevent the discharge of floatable and suspended solids.

(b) The results of the investigation shall be provided to Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager on completion and to the Compliance and Monitoring Liaison Group at their next meeting following completion.

Investigation of contamination of riparian areas

(19) (a) Within 18 months of the commencement of this consent, the consent holder shall complete an investigation into potential contamination of riparian areas as a result of overflow events and the health risk they may pose to riverbank users and residents.

(b) The results of the investigation shall be provided to Canterbury Regional Council, Attention: RMA Compliance and Enforcement Manager on completion and to the Compliance and Monitoring Liaison Group at their next meeting following completion

Review of Consent Conditions

(20) The Canterbury Regional Council may, once per year, on any of the last five working days of June or November, serve notice of its intention to review the conditions of this consent for the purposes of:

(a) 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; or
(b) requiring the adoption of the best practicable option to remove or reduce any adverse effect on the environment; or
(c) requiring screening at any overflow site; or
(d) addressing any discrepancy between modelled overflow frequency or volume and actual overflow frequency or volume.

Schedule 1

Overflow Point ID	Location		Receiving Environment	Date by which number of overflows to be no more than 2 annually
	Street	Grid Reference (NZMS 260)		
PS1/11	River Road	M35: 8288-4320	Avon River	Date of consent commencement
PS1/15	St Andrews Square	M35: 7870-4407	Avon River	Date of consent commencement
PS1/16-1	Fendalton Road Bridge	M35: 7875-4253	Avon River	1 Dec 2011
PS1/16-2	Fendalton Road Bridge	M35: 7874-4254	Avon River	Date of consent commencement
PS36/1	Pages Road	M35: 8754-4409	Avon River	Date of consent commencement
PS1/21	Grassmere Street	M35: 7942-4534	Avon River (via Dudley Creek)	Date of consent commencement
PS7/1	Slater Street	M35: 8196-4422	Avon River (via Dudley Creek)	Date of consent commencement
PS7/2	Warden Street	M35; 8212-4405	Avon River (via Dudley Creek)	Date of consent commencement
PS41/1	Westminster Street	M35: 8124-4492	Avon River (via Dudley Creek)	Date of consent commencement
PS40/1	Joy Street	M35: 8292-4502	Avon River (via Horseshoe Lake)	Date of consent commencement
PS19/1	Beckford Road	M36: 8240-3881	Heathcote River	1 Dec 2010
PS20/2	Waltham Road	M36: 8175-3927	Heathcote River	Date of consent commencement
PS20/3	Tennyson Street	M36: 8151-3878	Heathcote River	Date of consent commencement
PS20/4	Fisher Avenue	M36: 8155-3856	Heathcote River	Date of consent commencement
PS22/1	Eastern Terrace	M36: 8120-3739	Heathcote River	1 Dec 2011
PS23/1	Sandwich Road	M36: 8096-3818	Heathcote River	Date of consent commencement
PS15/1	Alport Place	M36: 8521-3915	Heathcote River	Date of consent commencement
PS11/1	Ferry Road	M35: 8394-4001	Heathcote River	Date of consent commencement
PS60/1	Halswell Road	M36: 7524-3687	Heathcote River (via Cashmere Stream)	Date of consent commencement
PS42/2	Sparks Road	M36:7736-3762	Heathcote River (via Cashmere Stream or open drain)	Date of consent commencement
PS09/1	Chelsea Street	M35: 8450-4065	Avon-Heathcote Estuary (via Linwood Avenue Canal)	Date of consent commencement
PS10/1	Linwood Avenue	M35: 8450-4065	Avon-Heathcote Estuary (via Linwood Avenue Canal)	Date of consent commencement