

## **Background, Statutory Requirements and Assessment of Effects**

### **1. Background**

#### **1.1 Water treatment process**

The Wainuiomata Water Treatment Plant supplies almost a quarter of Wellington's public water demand. Water treated by the plant is collected from intakes in the Wainuiomata River, George Creek, the Orongorongo River and Big Huia Creek (a tributary of the Orongorongo River).

Screens in the intakes remove sticks, leaves and gravel before the raw water is piped to the treatment plant. As the raw water enters the plant, carbon dioxide gas and lime are added to reduce its natural acidity. Microorganisms and dirt are then removed by flocculation. Flocculation is achieved by adding the coagulant, aluminium sulphate, which binds the dirt, colour and microorganisms (including *Giardia* and *Cryptosporidium* cysts) together to form **flocs**. The **flocs** are removed by dissolved air flotation. Pressurised air containing dissolved air is injected at the bottom of the flocculation tank causing millions of tiny bubbles to rise to the surface entraining the **flocs**. The **flocs** form a thick surface scum which is decanted and piped to the washwater recovery plant.

Dirt and **floc** remaining in the water are removed when the water is filtered through a sand filter. The material trapped by the sand filter is flushed out by back washing and is also piped to the washwater recovery plant. A centrifuge in the washwater recovery plant separates the **floc** and dirt into a liquid fraction (supernatant) and a sludge. Further aluminium-based coagulant is added in the washwater recovery plant to help thicken the sludge. The resulting sludge is trucked away for disposal at a municipal landfill. The majority of the supernatant is recycled back into the head of the plant. The applicant is seeking a discharge permit to discharge the remaining supernatant to the Wainuiomata River.

After filtration, the water acidity is again reduced with lime to control corrosion of pipes and fittings in the supply system. The water is disinfected with chlorine and fluoride is added to protect dental health.

#### **1.2 Public Health risks from supernatant recycling**

The level of *Giardia* and *Cryptosporidium* cysts in the catchment above the water treatment plant normally range between 0 to 5 cysts per litre. Concentrations increased during July and August 1998, with *Giardia* cysts reaching a maximum of 68 cysts per litre. Since that time a number of catchment management initiatives have been implemented including increased possum and deer control and further restrictions on public access. Protozoa numbers returned to the 0 to 5 per 100 litre range during 1999.

Although the majority of cysts will be captured in the sludge and landfilled, some cysts may remain in the supernatant and be recycled back into the head of the plant.

A review of the plant operation in 1998 indicated that recycling supernatant could cause protozoa cysts to be concentrated within the plant, potentially increasing the risk of cysts entering the treated water supply. While process modifications to optimise the performance of the washwater recovery plant were undertaken, supernatant was discharged to the river instead of being recycled. A review of the water treatment plant by Process Developments Ltd in May 1999 found that the optimisation work had been successful and that concentrations of protozoa in the supernatant are now normally lower than in the raw water entering the plant.

The review recommended that supernatant could safely be recycled into the head of the plant under most conditions. However, supernatant should not be recycled under certain plant operating conditions, and should be discharged to the Wainuiomata River instead.

### 1.3 Previous consents

In June 1998, the applicant was granted a non-notified water permit (WGN 980153 (03)) to discharge supernatant from the washwater recovery plant into the Wainuiomata River, **during the period following plant failure**. The permit was granted for a 20 year period and included the following condition:

*The maximum discharge rate to the Wainuiomata River shall not exceed 75 L/s and the maximum allowable discharge volume is 2,400 m<sup>3</sup>/day. The maximum number of discharges permitted per year is 10 and in any case no discharges are permitted when the flow over Morton Dam spillway is less than 58 L/s.*

In September 1998, the applicant was granted a non-notified water permit (WGN 990041) to **continuously** discharge supernatant from the washwater recovery plant into the Wainuiomata River for a period of three months subject to the following condition:

*The maximum discharge rate to the Wainuiomata River shall not exceed 7.5 L/s and the maximum allowable discharge volume is 2,400 m<sup>3</sup>/day. No discharges are permitted when the flow over Morton Dam spillway is less than 58 L/s.*

The short term duration of WGN 990041 was to give the applicant sufficient time to determine whether the practice of recycling supernatant into the head of the plant was indeed presenting a public health risk by allowing *Giarida* and *Cryptosporidium* cysts to enter the treated water supply.

## 2. Proposal

The applicant seeks to discharge supernatant to the Wainuiomata River under those operating conditions where recycling supernatant back into the head of the plant will increase the risk the protozoan cysts entering the treated water supply. There are three possible discharge scenarios which depend on the turbidity of the raw water being treated, and the turbidity of the supernatant. Turbidity levels are an indicator of likely protozoa concentrations, i.e., when raw water exceeds a turbidity of 4 NTU then protozoan concentrations are likely to be unacceptably high.

The discharge of supernatant from the washwater recovery plant is not directly to water, but first cascades over land and then into the Wainuiomata River channel.

## 2.1 Discharge scenarios

The applicant proposes that intermittent discharges will occur under the following three scenarios. In total, these discharges to the Wainuiomata River are expected to occur 30 to 35 percent of the time.

### (1) *High turbidity of raw water*

Following heavy rain in the Wainuiomata and Orongorongo water collection areas, stormwater run-off into the river tends to increase turbidity and protozoa concentrations in raw water feeding into the treatment plant. This increase in protozoa concentrations in the inlet water causes a corresponding increase in protozoa levels in the supernatant one to two days later. The applicant proposes that when protozoa levels in the supernatant are higher than those occurring in the raw inlet water, the supernatant should be discharged to the river instead of being recycled, i.e., when the turbidity of the raw water exceeds 4 NTU and for 48 hours after the turbidity of the raw water falls back to 4 NTU.

The applicant expects, based on raw water monitoring data for turbidity, that discharges of this type may occur just under 20 percent of the time.

### (2) *First five minutes of supernatant tank pumping*

Supernatant is held in the final tank of the washwater recovery plant prior to being pumped to the head of the plant for recycling or to the river. During the first five minutes of pumping the supernatant has the highest concentration of solids and protozoa. The applicant proposes that supernatant from first flush of the tank should be discharged to the river. Only after the turbidity of the supernatant has dropped to less than 6 NTU, should recycling be allowed to resume.

The discharge to the river from this scenario may occur on up to 10 pump cycles per day for a total of 50 minutes each day, or about 3.5 percent of the time.

### (3) *High turbidity of supernatant*

Turbidity levels in the supernatant may also exceed 6 NTU due to disruption to the normal washwater recovery process. The applicant proposes that only after the turbidity of the supernatant has dropped to less than 6 NTU, should recycling be allowed to resume.

The applicant expects, based on supernatant monitoring data for turbidity, that discharges of this type may occur approximately 13 percent of the time.

## 2.2 Whole effluent toxicity testing

The applicant engaged NIWA (National Institute of Water and Atmosphere) to undertake whole effluent toxicity testing (WETT). The WETT was carried out to determine the effect of the discharge on three phylogenetic levels of freshwater

organisms. WETT uses standard protocols to assess the toxicity of an effluent at a range of dilutions using Wainuiomata River water as a diluent.

The following organisms were tested:

- Native freshwater amphipod (*Paracalliops fluviatilis*)
- Native green alga (*Selenastrum capricornutum*)
- Rainbow trout (*Oncorhynchus mykiss*)

Two types of testing were undertaken. Acute toxicity testing measures the harmful effect, usually lethality, on organism over a short term exposure relative to the organism's life span. Chronic testing determines the concentration of an effluent that interferes with normal growth or reproductive potential.

The amphipod and trout were exposed to supernatant containing the maximum reported concentration of aluminium. The trout were not affected by 100 percent concentration of supernatant, and in one test amphipods were not affected by 56 percent concentration of supernatant.

The results of chronic toxicity testing show that supernatant concentration of approximately 20 percent produces growth inhibition in 50 percent of algae exposed to the supernatant during the testing.

The proposed rate of supernatant discharge is based on the results of NIWA's acute toxicity testing which indicate that supernatant concentrations of 20 percent or less have no observable toxic effect on rainbow trout or amphipods.

### 2.3 Discharge rates of supernatant

Proposed maximum discharge rates for a range of river flows are as follows:

<i>River flow rate (L/s)</i>	<i>Supernatant discharge (L/s)</i>	<i>Supernatant concentration in river</i>
58 (residual flow – current)	14.5	20 percent
100 (residual flow – RFP)	25	20 percent
200	50	20 percent
300	50	14 percent
7 12 (median)	50	7 percent

The applicant proposes that the rate of supernatant discharge will not exceed 50 L/s at any time and will not exceed 25 percent of the upstream flow. Therefore the concentration of supernatant will not exceed 20 percent in the river downstream of the discharge. At median river flows the concentration of supernatant in the river downstream of the discharge will be 7 percent.

### 2.4 Supernatant quality

Supernatant quality for all three discharge scenarios is likely to be similar. The applicant has summarised six months (January 1999 to June 1999) worth of supernatant monitoring data to show the variation in supernatant quality, as follows:

	<i>Turbidity</i>	<i>Aluminium g/m<sup>3</sup></i>	<i>CO<sub>2</sub> g/m<sup>3</sup></i>	<i>pH</i>	<i>Cl<sub>2</sub> g/m<sup>3</sup></i>
Minimum	0.54	0.01	1.40	6.65	0.0
Median	3.25	0.21	4.20	7.21	0.0
95 %ile	7.23	0.60	8.43	7.60	0.0
Maximum	16.2	0.88	30.0	7.66	0.0

The applicant proposes to take monthly grab samples of supernatant and report annually to determine whether the supernatant quality has changed from that presented in the consent application. The applicant proposes that a significant change in supernatant quality will trigger further WETT to determine whether the discharge has become more toxic with respect to aquatic life.

## 2.5 Macroinvertebrate monitoring

The applicant's consultant, Montgomery Watson, completed a macroinvertebrate survey before and during the continuous discharge of supernatant authorised by WGN 990041 during the 1998/1999 summer period. The aim of this survey was to monitor any changes in the invertebrate community composition attributable to the discharge. The applicant's consultant concludes from this survey that the effect of the discharge on invertebrate populations was minor and did not extend outside the mixing zone.

## 3. Notification

### 3.1 Notification of Application

The application was notified in the Evening Post on 27 November 1999. A sign was not placed on site as the discharge point and proposed mixing zone has no public access. Eight interested or affected parties, including iwi, Department of Conservation, and the Wainuiomata Community Board, were individually notified on 25 November 1999.

### 3.2 Submissions Received

Wellington Regional Council received four submissions prior to the closing date of 21 January 1999. Of these submissions, one supported the application, one offered conditional support and two submissions opposed the application. A summary of submissions is attached as Appendix One.

### 3.3 Pre-hearing Meeting

A pre-hearing meeting was held on 3 February 2000 to attempt to resolve issues raised in submissions prior to the Hearing of the application. The applicant and three submitters attended the pre-hearing meeting on the application. The meeting provided a useful informal situation to discuss issues and it was agreed that conditions could be imposed to address the concerns of submitters thereby negating the need for a formal hearing. A report of the meeting is attached as Appendix Two.

#### **4. Negotiated Consent Conditions**

All submitters and the applicant agreed to the recommended consent conditions. All submitters withdrew their right to be heard. Therefore, a formal Hearing is not required to determine this application.

#### **5. Statutory Reasons for Requiring Resource Consents**

Section 15 of the Resource Management Act 1991, *Discharge of contaminants into environment*, provides as follows:

- (1) *No person may discharge any:*
- (a) *Contaminant or water into water; or*
  - (b) *Contaminant onto or into land in circumstances which may result in that contaminant (or any other contaminant emanating as a result of natural processes from that contaminant) entering water, or.. .*

*unless the discharge is expressly allowed by a rule in a regional plan and in any relevant proposed regional plan, a resource consent or regulations.*

Application WGN 000071 [20200] is not *expressly allowed* by a rule in a regional plan. The application needs consent under section 15(1) of the Resource Management Act, 1991.

The application is to be assessed *as a discretionary activity* under Rule 2 of the Regional Plan for Discharges to Land (RPDL) *Discharges of contaminants not otherwise provided for*. This rule is the general default rule for discharges of contaminants to land where the discharge will contaminate water in a water body, that are not regulated by other rules in the RPDL.

#### **6. Matters to be Considered by the Committee**

Appendix Three outlines the matters the Committee must have regard to under sections 104 and 105 of the Resource Management Act when deciding on the applications. These include various sections of the Resource Management Act 1991 (RMA), as well as the relevant policies, objectives and rules in the Regional Policy Statement (RPS), the Regional Plan for Discharges to Land (RPDL) and the Regional Freshwater Plan (RFP).

#### **7. Assessment of Effects and Discussion of Matters to be Considered**

The following is my assessment of the effects arising from the discharge of supernatant into the Wainuiomata River. This section includes discussions of the relevant planning provisions, the submitters' concerns and mitigation measures proposed by the applicant.

## 7.1 Receiving environment

The Wainuiomata River above the water treatment plant has pristine water quality. This area is a closed native forest catchment which is managed for water supply purposes. Downstream from the water treatment plant, water quality deteriorates due to the impact of rural and urban run-off. The discharge from the Wainuiomata wastewater treatment plant (WWTP) in the middle reaches of the river causes a sharp increase in nutrients and bacteria levels. The high phosphorous levels in the WWTP discharge, combined with warmer summer temperatures, cause nuisance algal growths downstream. However the WWTP discharge into the river is expected to cease by June 2002 as required by discharge permit WGN 990084 held by Hutt City Council.

## 7.2 Mixing Zone

A mixing zone of 700 m downstream of the discharge point is proposed. The mixing zone terminates at the lower Wainuiomata dam. This end point has been selected for convenience of biological monitoring and because it is the point where public access begins and a barrier to fish migration starts.

Policy 5.2.11 (RFP) outlines the matters to consider when determining the zone for reasonable mixing of contaminants with the receiving water. The size of the zone allowed for reasonable mixing depends on the effects that non-compliance will have on the management of the receiving waters as directed by the RFP.

In this case, a mixing zone of 700 m is consistent with the management of the Wainuiomata for trout fishery as trout are excluded from the mixing zone by a physical barrier. The applicant's consultant estimates that full mixing will occur within 200 m of the discharge point. However, the degree of mixing may be reduced at times of low flow. The mixing zone is defined in condition 7 of the proposed conditions attached in Schedule One.

Wellington Fish and Game Council intend to inspect the mixing zone site during the spawning season (June) to determine whether the area has any value for spawning. The lower Morton dam upstream of the proposed discharge point and mixing zone, does provide some scope for fish migration.

The applicant has signalled that there may be some structural changes at some time in the future to the lower Wainuiomata dam which could affect its role as a fish barrier.

## 7.3 Toxicity of the discharge

Previous discharge permits issued to the applicant have stipulated an 'end of pipe' limit for contaminants, such as aluminium, in the discharge. However, it is difficult to set an environmentally-based limit for aluminium in the discharge. The 1992 Australian Water Quality Guidelines for Fresh and Marine Waters (ANZECC Guidelines) for protection of freshwater aquatic ecosystems recommend that the total aluminium concentration in waters should be less than 0.1 g/m<sup>3</sup> where the pH is greater than 6.50. However, guidelines based on total metal concentrations will be

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<sup>1</sup> Australian and New Zealand Environment and Conservation Council

over-protective, since only a fraction of the total metal concentration will be generally bioavailable, especially in samples containing significant concentrations of particulate matter<sup>2</sup>.

A further confounding factor is that naturally occurring aluminium levels in the Wainuiomata River fluctuate when clays containing bound aluminium enter the river and are dissolved, for instance through slips or during heavy rainfall. Previous monitoring undertaken by the applicant shows that naturally occurring levels of aluminium in the Wainuiomata River exceed the current ANZECC guideline of 0.1 g/m<sup>3</sup> when turbidity is high.

The advantage of using WETT is it reflects the combined toxicity of all the contaminants in the discharge and is therefore a more direct measure of the effect of discharge aquatic ecosystems.

#### 7.4 Effects on fishery

The Wainuiomata is an important fishery particularly in the forested upper reaches. Policy 5.2.3 (RFP) requires water quality of the Wainuiomata River between the Wainuiomata lower dam and the golf course to be managed for trout fishery and fish spawning purposes. The relevant water quality guidelines to consider are given in Appendices 8.4, 8.5, 8.1, 8.2 of the RFP and are reproduced in Appendix Four.

The lower Wainuiomata dam is a major barrier to fish migration upstream into the water supply area upstream of the lower Morton dam. The proposed mixing zone for the discharge terminates immediately downstream of the lower Wainuiomata dam.

The Wainuiomata River is now an extremely valuable recreation fishery due to the deterioration in the Hutt River fishery. The main concern of Wellington Fish and Game Council and the Wellington Flyfishers Club is the potential effect of the discharge on native brown trout spawning grounds. It was agreed at the Pre-Hearing Meeting that a representative of Wellington Fish and Game Council would inspect the mixing zone site during the fish spawning season in June.

The acute toxicity testing undertaken by NIWA on behalf of the applicant indicates that fingerlings of rainbow trout are not affected by the supernatant, even at 100 percent concentration of supernatant that contains the maximum reported aluminium concentration. Rainbow trout are sensitive to toxicants and are in the lowest sensitivity quartile and are therefore expected to have a comparable sensitivity response to that of the brown trout (*Salmo trutta*).

Condition 3 is proposed to require the applicant to monitor contaminants in the supernatant on a weekly basis. The reason for increasing the frequency of monitoring from monthly, as proposed by the applicant, to weekly is to ensure that the sample size is large enough to be statistically robust. If the monitoring data has little spread in variation and is normally distributed, then the frequency of monitoring can be reduced.

Condition 6 requires the applicant to analyse the preceding 12 months worth of supernatant monitoring data to determine whether there is any significant increase in

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<sup>2</sup> 1998: working draft of the ANZECC Guidelines for Fresh and Marine Water Quality



the concentration of contaminants or change in pH in the supernatant from that presented in the application.

If there is a significant increase in contaminants, then condition 8 requires applicant to carry out further WETT on representative samples of supernatant. If the WETT shows an increase in supernatant toxicity with respect to target organisms, then the Regional Council may invoke the provisions of condition 11 to review consent conditions.

Based on the evidence presented by the applicant, the proposal should not adversely affect trout fishery. There are sufficient safeguards incorporated into the proposed consent conditions to deal with any adverse effects that may arise at a later date. The discharge, after reasonable mixing, satisfies RFP water quality guidelines. Both Wellington Fish and Game Council and the Wellington Flyfishers Club have agreed to the recommended consent conditions.

## **7.5 Effects on aquatic ecosystems**

Policy 5.2.9 of the RFP identifies the lower reaches of the Wainuiomata River as needing enhancement for aquatic ecosystem purposes. The water quality in the lower reaches (below the Coast Road bridge) is degraded by discharge from the WWTP and cumulative effect of non-point discharges from urban and rural run-off.

Policy 5.2.6 of the RFP requires all surface water bodies (apart from those identified in Policy 5.2.9) to be managed for aquatic ecosystem purposes. The relevant water quality guidelines are in appendices 8.1 and 8.2 of the RFP which are reproduced in Appendix Four.

The acute toxicity testing undertaken by NIWA on behalf of the applicant indicates that at the maximum proposed discharge dilution there is no observable effect on arnhipods. The chronic toxicity testing shows that at the maximum proposed discharge dilution growth inhibition occurs in 50 percent of the alga tested. However, the alga tested is a sensitive indicator species. The applicant's consultant reports observing an increase in diatomaceous algae during the summer months (1998/1999) in the mixing zone. There are no obvious nutrients in the discharge which could contribute to this proliferation. It is possible that the increased temperatures and low summer flows were a major factor influencing algae growth in the mixing zone.

Based on the information provided by the applicant, there appear to be only minor and **localised** adverse effects on aquatic life. The discharge, therefore is not contrary to the RFP and should not after reasonable mixing, breach the relevant RFP water quality guidelines. There are sufficient safeguards incorporated into proposed consent conditions to monitor the effects of the discharge on aquatic life and to review consent conditions should adverse effects be demonstrated.

Condition 7 of the recommended consent conditions requires the consent holder to undertake an annual macroinvertebrate and periphyton survey to assess the affects of the discharge after reasonable mixing. Should adverse effects be indicated then the Regional Council may invoke the provisions of condition 11 to review consent conditions.

## 7.6 Effects on public health

The Wainuiomata River, downstream of the mixing zone and above the WWTP, is used for swimming at certain points. Policy 5.2.4 of the RFP requires the water quality of the Wainuiomata River to be managed for contact recreation purposes, i.e., angling, from the Coast Road Bridge to the river mouth. The relevant water quality guidelines are contained in appendix 8.3 of the RFP and are attached in Appendix Four. These guidelines state that the water must not be rendered unsuitable for bathing due to the presence of contaminants or through low visual clarity or contain undesirable biological growths as a result of the discharge of contaminants to water.

As far as I am aware the river water downstream of the discharge is not used for drinking, irrigation or stock watering purposes.

Regional Public Health do not have concerns about the effects of contaminants, such as aluminium, in the discharge on human health.

It is possible, at times, for the downstream levels of protozoa cysts to be slightly higher than upstream background levels due to the supernatant discharge. However, the public health risk associated recycling the supernatant discharge back into the treatment plant, and allowing cysts to enter treated water supply is far more serious. The public health risks due to the presence of protozoa in the discharge are insignificant when compared to the potential for pathogens in the discharge from the WWTP downstream.

The applicant has estimated the likely concentration of protozoa downstream of the discharge after reasonable mixing. This estimate is attached in Appendix Five and shows that average flows there is only a minor increase in protozoa concentration above upstream background levels for a short period (approximately five minutes). In low river flows the relative increase in protozoa is greater, but given that the discharge will only occur a few times per day, and as the levels are spread over a full day, the increase in protozoa is negligible. Under conditions of high flow there is a minor decrease in downstream levels of protozoa.

Regional Public Health noted at the Pre-Hearing Meeting that the application does not fully address the risk to public health associated with recycling of supernatant. Regional Public Health are concerned that the requirement to meet 1995 Drinking Water Standards for New Zealand for protozoa (i.e., no detection of pathogenic protozoa in 100 L of treated water) should not be sacrificed to meet consent restrictions on discharge of supernatant into the Wainuiomata River.

Regional Public Health would like the applicant to produce a risk management plan to address the potential risk to the public water supply associated with recycling supernatant into the head of the plant. However, I cannot recommend a consent condition to address this concern as it is outside the scope of the discharge permit applied for. The applicant is willing to provide such a plan for Regional Public Health outside the consent process.

The applicant does have some operating flexibility and can shut down the treatment plant so as to avoid the need to discharge supernatant into the river. The applicant is confident of being able to meet both the 1995 Drinking Water Standards for New Zealand and the proposed terms and conditions of the discharge permit.

Regional Public Health and Hutt City Council have agreed to the recommended consent conditions.

### **7.7 Effects on tangata whenua values**

Policies 4.2.1 to 4.2.8 of the RFP deal with the relationship of tangata whenua with freshwater. The applicant sought the views Te Runanganui o Taranaki Wahnaui ki Te Upoko o Te Ika a Maui, who have a special interest in the area, before the application was lodged. No formal response was received. Te Runanganui o Taranaki Wahnaui ki Te Upoko o Te Ika a Maui and Wellington Tenths Trust were individually notified of the application. Neither of these iwi groups submitted on the application.

### **7.8 Alternatives to the discharge**

The application states that recycling all supernatant back into the plant inlet potentially concentrates protozoa within the treatment plant, thus increasing the risk of protozoa entering the public water supply. The applicant has carried out process modifications to the plant to optimise the performance of the backwash recovery plant so the majority of supernatant can be recycled with confidence. A possible process improvement to ensure supernatant can be safely recycled is to use ozone remove cysts from the supernatant before it is recycled back into the plant. The applicant has not opted for this system at present due to high running costs and on-going maintenance associated with ozone treatment costs.

Another alternative to the discharge is to lay a sewer into the Wainuioimata township to convey the supernatant to the Waste Water Treatment Plant. This option is expensive (\$0.5 to \$1 million) and there is some uncertainty as to whether the reticulation has sufficient capacity to accept this relatively large flow.

### **7.9 Part II Matters**

The proposal is not contrary to Part II of the Resource Management Act 1991.

### **7.10 Conclusion**

I consider the potential adverse effects of this proposal can be adequately avoided, remedied or mitigated through the imposition of the recommended consent conditions.

## **8. Term of the Consent**

I recommend that a consent term of fifteen years be granted. All submitters have agreed to this consent term being imposed. The proposed review condition allows for conditions to be reviewed should adverse effects from the discharge be established, for example, as a result of the applicant's monitoring.

## Appendix One

Surname/ Organisation name	First Names/ Contact Name	Support/ Oppose	Submission Reason
Fish & Game New Zealand	Andrew Bond	Oppose	Oppose the application due to potential adverse effects on trout, trout habitat and angling opportunity within the Wainuiomata River. Would like to see a programme put in place to either improve discharge quality or cease the discharge within the foreseeable future.
Hutt City Council	Gary O'Meara	Conditional support	Support the application to discharge supernatant to Wainuiomata River subject to downstream monitoring for protozoa to ensure the health of swimmers over the summer period is protected.
Regional Public Health	Philippa Hogarth	support	Supports the application to intermittently discharge supernatant. However, have concerns about the practice of recycling supernatant back into the treatment plant as this practice increases the risk of <i>Giardia</i> cysts entering the treated water supply. The discharge of all supernatant to the sewer or to the Wainuiomata River would provide greater protection to public health. A risk management plan is needed to minimise the risks to public health due to recycling of supernatant back into the plant.
Wellington Flyfishers Club Inc.	Strato Cotsilinis	Oppose	Concerns about effect of supernatant discharge on trout fishery. The application does not adequately examine the effects of the discharge on spawning habitat and brown trout population.

## Appendix Two

3 February 2000  
File: WGN 000071

### Notes of a Pre-hearing Meeting held on 3 February 2000 at, 10 am at the Wellington Regional Council

## Water Group, Wellington Regional Council Application to discharge supernatant to the Wainuiomata River

### Present

Strato Cotsilinis (Wellington Fly Fishers Inc), Peter Taylor (Fish & Game), Andrew Bichan (Regional Public Health), Alastair McCarthy (Water Group, WRC), David Cameron (Montgomery Watson), Chris Laidlow (Water Group, WRC), Tamsin Mitchell (Consents Management), Nigel Corry (Facilitator, Consents Management).

#### 1. Introduction

Nigel Corry opened the meeting by welcoming everyone and explained that the purpose of the meeting was to address any questions the submitters may have of the applicant, and to talk about their submissions.

Alastair McCarthy then gave a brief presentation describing the background to the application and details of the proposed discharge. Alastair explained that 70 percent of supernatant would be recycled and that recycling was the preferred option over discharging which was essentially a waste of treated water. A lot of work has been carried out to optimise plant efficiency and there is now better control and monitoring of the supernatant discharge. Supernatant quality has been improved and chemical use reduced. Treated water is now meeting  $>0.1$  NTU which is better than the current drinking water standard of  $>0.5$  NTU necessary to reduce risk of *Cryptosporidium* entering treated water.

There was some discussion about the relationship between turbidity and river flows or rain events. It was estimated that about 10 -15 times per year the turbidity in the river would exceed 4 NTU. Peter asked if there was a build up of sediment below the discharge point. David replied that he had seen sediment build up in the pool downstream of the discharge point – but this sediment would be flushed out by high flows.

## 2. Discussion of Issues

### *Mixing zone*

Alastair clarified that the mixing zone allowed for under the previous consent was approximately 700 m. Peter commented that this zone was very liberal given the size of the river. David confirmed that full mixing was likely to occur within 200 m and that the 700 m zone was one of practicality as it ended at the lower Wainuiomata dam which is a barrier to fish migration. Alastair commented that the future of the lower Wainuiomata dam was uncertain and there was a possibility that the fish barrier could be removed.

### *Concerns about fishery and spawning*

Strato explained that due to the collapse of the Hutt River fishery, anglers were now reliant on the Wainuiomata River. Therefore, ensuring spawning grounds are not affected by the proposed discharge is extremely important. As most fry emerge in the spring time, he was concerned about the larger volume of discharges during spring rains. Strato also noted that the main spawning area in the Wainuiomata River was above the town.

David elaborated that NIWA carried out toxicity tests on rainbow trout because they had a testing protocol in place for this species. Both rainbow and brown trout are in the lower 25 percentile of sensitivity and therefore would have comparable responses to the supernatant. David confirmed that testing was carried out on fingerlings weighing approximately 50 g. Peter confirmed that these fingerlings would have been 3-6 months old. Strato commented that supernatant discharge at Te Marua into Bengie Creek did not appear to affect adult trout and that his main concern was about fry.

Peter reiterated the importance of the Wainuiomata River as a trout fishery. Peter would like more information on whether the reach between the lower Morton Dam and old lower dam (i.e., the mixing zone for the discharge) had any value for spawning. Peter and David will go and have a look at the site during spawning season some time in June. Peter stated that Fish & Game would not object to the consent as long as the conditions were not more liberal than those proposed by the applicant and there would be opportunity to review the consent if adverse effects were observed.

### *Health effects*

There was some discussion about downstream protozoa levels as a result of the discharge. Chris commented that overall the level of protozoa cysts in the river would be reduced as most of the cysts are removed in the sludge fraction and disposed of to landfill. However it is possible, at times, for downstream levels of cysts to be slightly higher than upstream background levels. Andrew explained that the public health risks from contact in the river due to the supernatant discharge were insignificant compared to the discharge from the sewage treatment works downstream.

Andrew asked the applicant to calculate the concentration of cysts in the river from the discharge. Alastair reported that an indicative figure could be provided but that the cyst levels in the discharge and the raw water varied over time. Andrew reiterated that the public health risk of cysts in drinking water is far more serious than cysts in the river and that WRC was managing the catchment to reduce protozoa levels. Chris confirmed that there were signs that restricted public access to the discharge and

mixing zone area. Chris also stated that the aluminium residual in the ANZECC guidelines for protection of aquatic ecosystems was lower than the drinking water standards.

#### *Alternatives to the discharge*

Alastair explained that connecting the discharge to the sewer had been investigated and found to be very expensive (\$0.5-\$1m) and doubts that the Lower Hutt sewerage system could assimilate the volume which would be close the present average dry weather flow. There was the option of using a lagoon as a buffer for the supernatant discharge but the logistics of siting the lagoon had not been explored. Another option is upgrading the supernatant discharge so all of the flow could be recycled back into the plant using ozone treatment to oxidise any cysts. An ozone treatment plant, while not as expensive as connecting to sewer, would have high on-going maintenance and running costs and would take about 12-18 months to install. The system also has health and safety implications.

Peter mentioned that there were options such as improving trout recruitment areas in other parts of the catchment, such as the catchpool or above the lower Morton Dam. Dave mentioned the idea of removing the fish barrier at the lower Wainuiomata dam. Alastair thought it would be difficult to justify further expenditure when the toxicity testing shows no effect on rainbow trout.

Tamsin mentioned that the Wainuiomata sewage treatment plant discharge would cease by June 2002. Dave commented that this would remove flow from the river and that maintaining the supernatant discharge could be beneficial in keeping flows to assist the fishery.

#### *Regional Freshwater Plan*

This plan is now operative and clearly states that the area of river below the discharge point is to be managed for fishery and fish spawning.

#### *Risk management plan*

Andrew stated that the monitoring proposed by the applicant does not fully address the risk to public health associated with recycling of supernatant. It is important for the plant to be able to discharge supernatant to the river if the need arises without having to go through a lengthy consent process. The applicant should be aware that possible future changes to the NZ Drinking Water Standards may mean that treatment plants which recycle supernatant receive a lower grading because of the increased risk to public health.

Tamsin stressed that it would not be good if the plant failed to meet drinking water standards and supernatant had to be discharged at a rate which breached the consent. We need to be confident that the applicant can comply with consent at all times. Alastair explained that the plant could be shut down immediately to avoid the need to discharge supernatant. However, the plant could not be shut down for more than a certain period without having to impose public water restrictions. Andrew requested that a condition requiring the applicant to produce a risk management plan be imposed. It was acknowledged that the applicant had improved the efficiency and monitoring of the plant and so there was increased confidence that the plant could continue to recycle and still meet drinking water standards.

### **3. Conclusion**

It was agreed that Tamsin would draft up some possible consent conditions and circulate them to the parties involved. If everyone can agree on consent conditions then a full hearing will not be necessary. However, Nigel stressed that attempting to come up with consent conditions does not preclude holding a hearing.

Alastair confirmed that a consent term of 15 years was sought.

Nigel Corry thanked everyone for their attendance and closed the meeting at 12 noon.



## Appendix Three

### Matters to be Considered

#### Resource Management Act 1991

Section 104 of the Resource Management Act 1991 outlines the matters that a consent authority is to have regard to when considering an application. Section 104 gives precedence to Part II of the Act.

Section 104(1) states that the consent authority shall have regard to:

- (a) *Any actual and potential effects on the environment of allowing the activity; and*
- (b) *Any relevant regulations; and*
- (c) *Any relevant national policy statement, New Zealand coastal policy statement, regional policy statement, and proposed regional policy statement; and*
- (d) *Any relevant objectives, policies, rules, or other provisions of a plan or proposed plan; and*
- (e) *Any relevant district plan or proposed district plan, where the application is made in accordance with a regional plan; and*
- (f) *Any relevant regional plan or proposed regional plan, where the application is made in accordance with a district plan; and*
- (g) *Any relevant water conservation order or **draft** water conservation order, and*
- (h) *Any relevant designations or heritage orders or relevant requirements for designations or heritage orders; and*
- (i) *Any other matters the consent authority considers relevant and reasonably necessary to determine the application.*

Section 104(3) states:

*Where an application is for a discharge permit or a coastal permit to do something that would contravene section 1.5 (relating to discharge of contaminants), the consent authority shall, in having regard to the actual and potential effects on the environment of allowing the activity, have regard to-*

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

Section 2 defines River as:

*a continually or intermittent **flowing** body of **fresh** water; and includes a stream and **modified** watercourse;. . . .*

Section 3 of the Act, *effect* means:

- (a) *Any positive or adverse effect; and*
- (b) *Any temporary or permanent effect; and*
- (c) *Any past, present, or future effect; and*
- (d) *Any cumulative effect which arises over time or in combination with other effects-regardless of the scale, intensity, duration, or frequency of the effect, and also includes-*
- (e) *Any potential effect of high probability; and*
- (f) *Any potential effect of low probability which has high potential impact.*

### **Section 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 well-being 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 &e-supporting capacity of air, water, soil, and ecosystems; and*
  - (c) *Avoiding, remedying or mitigating any adverse effects of activities on the environment.*

### **Section 6 - Matters of national importance**

*In achieving the purpose of this Act, all person exercising functions and powers under it, in relation to managing the use, development, and protection of natural and physical resources 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.*

### **Section 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:*
- (b) The **efficient** use and development of natural and physical resources:*
- (c) The maintenance and enhancement of amenity values:*
- (d) Intrinsic values of ecosystems:*
- (e) Recognition and protection of the heritage values of sites, buildings, places, or areas:*
- (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.*

### **Section 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 section 87 resource consents means:

- (a) *a consent to do something that would otherwise contravene section 13 (in this Act called a “land use consent”).*

## **Regional Policy Statement for the Wellington Region**

### **Chapter 4 The Iwi Environmental Management System**

Objective 2 *The principles of the Treaty of Waitangi are taken into account in resource management.*

Policy 2 *To support the active participation of tangata whenua in the development and implementation of resource management policy and plans, and in the resource consent granting process,*

Policy 4 *To recognise and provide for the relationship of Maori and their culture and traditions with their ancestral lands, water, sites, waahi tapu and other taonga.*

Policy 6 *To recognise and promote the role and importance of kaitiakitanga.*

### **Chapter 5 Fresh Water**

Objective 1 *The quantity of fresh water meets the range of uses and values for which it is required, safeguards its life supporting capacity, and has the potential to meet the reasonably foreseeable needs of future generations.*

Objective 2 *The quality of fresh water meets the range of uses and values for which it is required, safeguards its life supporting capacity, and has the potential to meet the reasonably foreseeable needs of future generations.*

Objective 3 *Freshwater resources of significance or of high value for cultural, spiritual, scenic, ecosystem, natural, recreational, or other amenity reasons are protected or enhanced.*

Policy 1 *To manage the quantity of fresh water so that it is available for a range of uses and values, and:*

- 1. Its life supporting capacity is safeguarded; and*
- 2. Its potential to meet the reasonably foreseeable needs of future generations is sustained; and*
- 3. For surface water, any adverse effects on aquatic ecosystems are avoided remedied or mitigated*

Policy 4 *To maintain and protect the quality of fresh water so that it is available for a range of uses and values, and:*

1. *Its life supporting capacity is safeguarded; and*
2. *Its potential to meet the reasonably foreseeable needs of future generations is sustained; and*
3. *For surface water, any adverse effects on aquatic and riparian ecosystems are avoided, remedied, or mitigated.*

This policy is similar to Fresh Water Policy 1. It is aimed at ensuring there is water available of a quality that meets the uses and values which might reasonably be expected of it. Quality may have a number of dimensions (colour, clarity, the presence of contaminants, biological growths, etc.) and these may vary from one water body to another. The desired quality of a water body will depend on the uses and values which the community desires for it. For example, it may be desirable to allow some deterioration in one river in order to protect the special scenic or recreational values of another.

The policy **recognises** that fresh water may be used to assimilate wastes and that there may be some acceptable diminution, or local deterioration, of water quality as a result. However, in no instance should any deterioration in quality be allowed to jeopardise the life supporting capacity of the water body or prevent its potential for providing for the needs of future generations from being realised. With regard to surface water, the needs of the aquatic ecosystem also need to be considered and adverse effects provided for, where necessary. The Act also contains a number of parameters relating to surface water quality which must not be exceeded (e.g., s. 69 and 70). These parameters are also relevant to other policies in this chapter (e.g., Policies 6, 9 and 10).

Water bodies may need to be protected from a number of external influences or changes in their composition. For surface water this could include waterborne disease, sewage, excess nutrients, changes in temperature and colour, or activities likely to damage the aquatic ecosystem (such as river works). If water bodies are to be managed according to differing parameters, it follows that what is maintained or protected will also vary from one water body to another.

While the overall intent of this policy is to ensure water is available for the widest possible range of uses and values, it is **recognised** that in some cases some of these may be inconsistent with others.

Policy 5 *To improve water quality and restore contaminated water to a standard which is appropriate for its desired uses and natural values.*

Natural and near natural water is widely sought after by people. It protects ecosystems and contributes to meeting the needs of future generations. The degree of improvement required for any particular water body should be determined by reference to the uses the community may desire of it and the values attached to it. In this policy the word “uses” should be widely defined

to include any values which the community may also attach to the water. This may include, for example, recreational, aesthetic, or cultural values.

The community may be happy to see lesser quality water continue in some cases where the cost of improvement is prohibitive. Implementation of the policy should also **recognise** that some contaminated water is naturally contaminated and enhancement is not realistic. For example, some groundwater is more highly mineralised than other groundwater. This is because saline water from deeper formations has migrated to near surface water through natural processes such as faulting.

This policy is also important for integrating environmental processes in both inland and coastal waters. The policy seeks to ensure that, where necessary, the quality of the water entering the coastal marine area is improved with a consequent improvement in the quality of coastal waters.

Policy 6 *To ensure that the effects of contaminants contained in point source discharges on the quality of **fresh** water and aquatic ecosystems are avoided, remedied, or mitigated and allowing for reasonable mixing..*

1. *Do not render any **fresh** water unsuitable for any purpose specified in any regional plan for that water;*
2. *Do not prevent the receiving **fresh** water **from** meeting any standards established in any regional plan for that water;*
3. *Do not render any water in the coastal marine area unsuitable for any purpose **specified** in a regional coastal plan for the Wellington Region.*

Point source discharges of contaminants emanate from a single (usually controllable) source. Examples include stormwater discharges, pollution spills, mining discharges, sewage overflows and discharges, landfills, dairy shed effluent disposal, piggery and poultry farms wastes, and septic tanks.

A variety of instruments is currently in place to manage these activities, but there are inconsistencies of approach across the Region. The effects of some of the more minor of these activities are covered by rules in the Transitional Regional Plan called general authorisations. These allow activities to occur without a resource consent. However, the effects of some of these may not be sustainable.

The potential for the quality of point source discharges to be controlled means that the discharge of contaminants can be managed to meet any desired objectives in relation to receiving waters. Discharges can be tied to the purposes to which their receiving waters are put (clause 1 of the Policy). Under the Act, purposes for particular water bodies may be specified in a regional plan (s. 69).

Clause 2 of the policy is designed to ensure that the discharge of contaminants does not prevent the receiving water from meeting any standards that may have been established for it.

The purpose of clause 3 is to ensure that the quality of fresh water entering the coastal marine area does not affect the quality of any water in that area to such an extent that it is not suitable for any purpose specified in the Regional Coastal Plan for the Wellington Region.

Clause 3 also provides for the resources of the Region to be managed in an integrated manner, consistent with the philosophy of the Act (s. 59).

In addition to the requirements of this Policy, any discharge for which a resource consent is granted by the Council must, after reasonable mixing, comply with criteria established by the Act (s. 107(1)). These criteria establish a set of statutory minimum water quality standards that apply irrespective of whether a discharge is permitted as of right or controlled in some way.

Policy 10 *To manage the quality of water in, and the flows, levels and beds of, waterbodies so that the following values are protected:*

- (1) *Regionally significant natural features, indigenous vegetation or regionally significant habitats of indigenous aquatic fauna, including those identified in table 4.*
- (2) *Scenes or landscapes of regional significance within which water forms an essential component, as identified in table 5.*
- (3) *Landforms and geological features of regional significance, including those identified in table 6.*
- (4) *Heritage, recreational, scientific, or other amenity or intrinsic values of regional significance, including those identified in table 7.*

This policy is designed to provide a high degree of protection for waters of high value. Rivers, lakes, and streams may be regarded as regionally significant for a number of reasons. These include the presence of indigenous fauna and flora, scenic or landscape attributes, the presence of landforms or geological features (fault trace, river terrace, dune lakes, etc.), naturalness, heritage, recreational, or scientific qualities, and other amenity or intrinsic values (e.g., their form, biological diversity, resilience).

Some of these values are matters of national importance which are required to be recognised and provided for in a Regional Policy Statement (s. 6). Others are mentioned in s. 7, which states that particular regard shall be had to amenity values (including heritage, recreational, and scientific values), the intrinsic values of ecosystems, the quality of the environment and any of its finite features.

Although s. 6 refers to the need to protect outstanding natural features, the Act provides no guidance as to the meaning of this word. In this case (Policy 10(1)) any natural feature which is regionally significant is considered to be an outstanding natural feature under s. 6.

Table 7 : Water Bodies of Regional Significance for their Heritage, Recreational or Other Amenity Values

Mid-Ruamahanga River (recreation, angling)  
 Otaki River, gorge and above (recreation, angling)  
 Otaki River, gorge to State Highway 1 (recreation, angling)  
 Hutt River, Kaitoke Gorge and above (recreation)  
 Mid-Hutt River (angling)  
 Wainuiomata River (angling)  
 Kopuaranga River (angling)  
 Middle and Lower Orongorongo (recreation)  
 Lake Onoke (recreation)  
 Lake Wairarapa (recreation, waterfowl hunting)

## **Chapter 9 : Ecosystems**

Objective 1 *The overall quality of ecosystems in the Region is increased*

Objective 2 *Healthy, functioning ecosystems are distributed throughout the Region, including the rural and urban environments.*

Objective 3 *The area and quality of indigenous ecosystems in the Region is increased.*

Objective 4 *The Region has a diversity of healthy ecosystems which represent the full range of regional flora, fauna and habitats.*

Policy 4 *To avoid remedy or mitigate the adverse **effects** of activities on ecosystems, and in particular, to avoid, remedy or mitigate any of the following effects.*

(1) *Reduction in the indigenous biodiversity of an ecosystem;*

(2) *Prevention of the natural processes of an ecosystem, including nutrient cycles and energy flows, **from** operating **effectively**;*

(3) ***Simplification** of the structure of indigenous ecosystems; and*

(4) *Reduction in the quality or quantity of the non-living parts of an ecosystem (e.g., decaying plant and animal remains, water, air, soil) to a level which adversely affects the **life-supporting** capacity of the ecosystem.*

Policy 7 *To actively protect:*

(1) *Indigenous ecosystems; and*



- (2) *Urban and rural ecosystems which have been identified as being of high priority for protection.*

## **Regional Freshwater Plan for the Wellington Region**

- Objective 5.1.1 *The quality of fresh water meets the range of uses and values for which it is required while the life supporting capacity of water and aquatic ecosystems is safeguarded.*
- Objective 5.1.2 *The quality of fresh water has the potential to meet the reasonably foreseeable needs of future generations.*
- Objective 5.1.3 *The quality of water is, as far as practicable, consistent with the values of the tangata whenua.*
- Policy 5.2.3 *To manage water quality for trout fishery and fish spawning purposes in those rivers, or parts of rivers, identified in Appendix 4 (subject to Policy 5.2.10).*

**Explanation.** This policy sets out areas where water quality will be managed for trout fishery, and fish spawning purposes. These water bodies are also identified in Policy 4.2.14 as important trout habitat in the Region.

This policy applies to the overall management of receiving waters. The relevant guidelines to consider when deciding whether a discharge is able to satisfy this policy are given in sections A8.4 and A8.5 of Appendix 8.

Note that if a water body is identified for any other purpose in Policies 5.2.1 to 5.2.6, then the additional purpose(s) also apply to the water body.

The bracketed reference to Policy 5.2.10 recognises that discharge permits can be granted in the circumstances described in Policy 5.2.10.

**[The Wainuiomata River between Wainuiomata Lower Dam at R27 768 912 and the Golf Course at R27 7218731**

- Policy 5.2.4 *To manage water quality for contact recreation purposes in those water bodies identified in Appendix 5 (subject to Policy 5.2.10), excluding Lake Waitawa (managed according to Policy 5.2.6) and Lake Wairarapa (managed according to Policies 5.2.2 and 5.2.6)*

**Explanation.** This policy sets out the areas where water quality will be managed for contact recreation purposes. These water bodies are also identified in Policy 4.2.15 as regionally important for their amenity and recreational values.

This policy applies to the overall management of receiving waters. The relevant guidelines to consider when deciding whether a discharge is able to satisfy this policy are given in section A8.3 of Appendix 8.

Note that if a water body is identified for any other purpose in Policies 5.2.1 to 5.2.6, then the additional purpose(s) also apply to the water body.

The bracketed reference to Policy 5.2.10 recognises that discharge permits can be granted in the circumstances described in Policy 5.2.10.

**[The Wainuiomata River from the Coast Road bridge at R27 737 907 to the river mouth at R28 669 755 for angling]**

Policy 5.2.9

*To manage the quality of the **fresh** water of the rivers, or parts of rivers, identified in Appendix 7 so that water quality is enhanced to satisfy the purposes identified in the Appendix (subject to Policy 5.2.10).*

**Explanation.** There are water bodies in the Region that consistently have poor water quality according to the Regional Council's water quality monitoring programmes. These water bodies include those listed in Appendix 7. This policy seeks enhancement of the water bodies identified in this Appendix for contact recreation, aquatic ecosystem purposes, or trout fishery and fish spawning purposes.

The relevant guidelines to consider when deciding whether a water body is suitable for contact recreation, aquatic ecosystem purposes or trout fishery and fish spawning purposes are given in sections A8.1; and either A8.2 or A8.3; or A8.4 and A8.5 of Appendix 8.

The bracketed reference to Policy 5.2.10 recognises that discharge permits can be granted in the circumstances described in Policy 5.2.10.

The water bodies listed in Appendix 7 are based on information held by the Council in December 1998 (the date of the Hearings on the Proposed Plan).

**[For aquatic ecosystems purposes and for fishery and fish spawning purposes - Wainuiomata River from the coastal marine area boundary at R28 676 755 upstream to R27 734 959]**

Policy 5.2.6

Except for rivers and streams identified in Appendix 7, to manage the water quality of all surface water bodies in the Region for aquatic ecosystem purposes (subject to Policy 5.2.10).

**Explanation.** *This policy provides for all surface **fresh** water in water bodies of the Wellington Region to be managed so that water is of a suitable quality for aquatic ecosystem purposes. It includes all surface fresh water identified in Policies 5.2.1 to 5.2.5, above, and all surface **fresh** water not identified in these policies.*

*This policy applies to the overall management of receiving waters. The relevant guidelines to consider when deciding whether a discharge is able to satisfy this policy are given in sections A8.1 and A8.2 of Appendix 8.*

*Note that if a water body is identified for any other purpose in Policies 5.2.1 to 5.2.5, then the additional purpose(s) also apply to the water body.*

*The bracketed reference to Policy 5.2.10 recognises that discharge permits can be granted in the circumstances described in Policy 5.2.10.*

Policy 5.2.8 To have regard to the relevant guidelines in Appendix 8 when deciding whether a discharge is able to satisfy Policies 5.2.1 to 5.2.7 (above) when considering applications for resource consents (subject to Policy 5.2.10).

***Explanation.*** *This policy refers to Appendix 8, which contains the guidelines which need to be met for a discharge to satisfy Policies 5.2.1 to 5.2.7. The consent authority will use these guidelines to assist it in setting maximum limits of contaminants for individual discharges.*

*It is important to note that the guidelines in Appendix 8 relate to the cumulative effects of all discharges to a particular water body. When assessing an application to discharge contaminants, the consent authority will consider whether the guidelines can be met given the effects of existing discharges,*

*The bracketed reference to Policy 5.2.10 recognises that discharge permits can be granted in the circumstances described in Policy 5.2.10.*

Policy 5.2.9 To manage the quality of the fresh water of the rivers, or parts of rivers, identified in Appendix 7 so that water quality is enhanced to satisfy the purposes identified in the Appendix (subject to Policy 5.2.10).

***Explanation.*** *There are water bodies in the Region that consistently have poor water quality according to the Regional Council's water quality monitoring programmes. These water bodies include those listed in Appendix 7. This policy seeks enhancement of the water bodies identified in this Appendix for contact recreation, aquatic ecosystem purposes, or trout fishery and fish spawning purposes.*

*The relevant guidelines to consider when deciding whether a water body is suitable for contact recreation, aquatic ecosystem purposes or trout fishery and fish spawning purposes are given in sections A8.1; and either A8.2 or A8.3; or A8.4 and A8.5 of Appendix 8.*

*The bracketed reference to Policy 5.2.10 recognises that discharge permits can be granted in the circumstances described in Policy 5.2.10.*

*The water bodies listed in Appendix 7 are based on information held by the Council in December 1998 (the date of the Hearings on the Proposed Plan).*

**[For aquatic ecosystems purposes and for fishery and fish spawning purposes - Wainuiomata River from the coastal marine area boundary at R28 676 755 upstream to R27 734 959]**

Policy 5.2.10 *To allow the discharge of contaminants to **fresh** water which do not satisfy Policies 5.2.1 to 5.2. 9, whichever is (are) relevant, only where:*

- (1) *the discharge is of a temporary nature; or*
- (2) *the discharge is associated with necessary maintenance works; or*
- (3) *exceptional **circumstances justifying** the granting of a permit; or*
- (4) *the discharge.*
  - *was present at the time the Plan was **notified**; and*
  - *is not likely to cause a decrease in the existing quality of water at that site and the person responsible for the discharge has defined a programme of work for upgrading the discharge within a specified **timeframe**; or*
- (5) *that in any event, it is consistent with the purpose of the Act to allow the discharge.*

**Explanation.** This policy outlines the guidelines under which the Council will grant a discharge permit that does not satisfy Policies 5.2.1 to 5.2.9. Clause (4) relates to the need to improve discharges to water bodies in the Region which are of poor water quality such as those identified in Policy 5.2. 9.

## **Mixing Zones**

Policy 5.2.11 *To ensure that any zones allowed on a discharge permit for reasonable mixing of contaminants or water with the receiving water are determined by having regard to:*

- *the purpose for which the receiving water is being managed and any effects of the discharge on that management purpose; and*
- *any tangata whenua values that may be affected; and*
- *the volume of water or concentration of contaminants being discharged and the area of receiving water that could potentially be affected; and*
- *the physical, hydraulic and hydrological characteristics of the receiving water.*

**Explanation.** Both s107 and the Third Schedule of the Act direct that the effects of discharges are to be considered after reasonable mixing of the contaminants with the receiving water. The size of the zone allowed for reasonable mixing depends on the effects that non-compliance within the zone will have on the management of the receiving water as directed by Policies 5.2.1 to 5.2.6 of the Plan and by s 107 of the Act. For example, the size of a zone allowed for reasonable mixing of ammonia may depend on whether the zone causes a block to fish passage (because of its toxicity and potential for significant adverse effects on aquatic life). The size of the zone allowed for reasonable mixing of nutrients may depend on whether algal growths will attach to stones on the bed downstream of the discharge (undesirable biological growths are not allowed in waters managed for contact recreation, fish spawning, water supply, or aquatic ecosystems).

### **The relationship of tangata whenua with fresh water**

Objective 4.1.1 *The relationship of tangata whenua and their culture and traditions with fresh water, and with ancestral sites, waahi tapu and other taonga within the beds of rivers and lakes, is recognised and provided for.*

Objective 4.1.2 *The mauri of water bodies and river and lake beds is protected*

Objective 4.1.3 *The principles of the Treaty of Waitangi are taken into account in the management of the Region's water bodies and river and lake beds.*

Policy 4.2.1 *To manage sites of special value to the tangata whenua in water bodies and river and lake beds so that the cultural values of those sites are not adversely affected.*

**Explanation.** Sites of special value to the tangata whenua include sites that are of spiritual, cultural or historical significance to tangata whenua. Examples of such sites could include mahinga kai (and the habitats of harvested species), taonga raranga and waahi tapu.

Method 8.1.1 indicates how the Council will implement this policy.

Policy 4.2.2 To encourage applicants to consult directly with affected tangata whenua when making an application for a resource consent which is for an activity within, upstream, or immediately downstream of any identified site of special value to the tangata whenua. As part of this consultation the applicant should determine:

- (1) Whether granting the resource consent could have any adverse effects on the special values of the site.
- (2) How any potential adverse effects that might result from the activity could be avoided or remedied.

**Explanation.** Although the location of sites of special value may be known, only tangata whenua are able to advise how the values ascribed to those

*sites might be adversely affected. Consultation is an essential part in any decision making that affects sites of special value.*

*In this context, an "identified site" means any site managed according to Policy 4.2.1 which is identified as a result of implementing Method 8.1.1.*

- 4.2.3 To not allow the use or development of water bodies and river and lake beds that would restrict the access of tangata whenua to any identified site of special value in a publicly owned river or lake bed, unless that access can specifically be provided for, or the loss can be adequately remedied or mitigated.

***Explanation.*** *In this context, an "identified site" means any site managed according to Policy 4.2.1 which is identified as a result of implementing Method 8.1.1.*

- 4.2.4 To avoid, remedy, or mitigate the adverse effects of the use and development of water bodies and river and lake beds on the habitats of species traditionally harvested by the tangata whenua.

***Explanation.*** *Water bodies and river and lake beds are traditional harvesting sites used by tangata whenua. Today, however, because of loss of habitat, species such as eels and lamprey have been reduced in numbers. It is now important that the use and development of land and fresh water do not further reduce numbers of these species.*

- 4.2.5 To have regard to the values and customary knowledge of the tangata whenua, where these have been identified by the tangata whenua, when assessing resource consent applications for the use and development of water bodies and river and lake beds.

***Explanation.*** *Although tangata whenua may have concerns related to specific water bodies and river and lake beds, general cultural values and beliefs are applied to many water bodies and river and lake beds.*

- 4.2.6 To not restrict tangata whenua initiatives for the use or development of freshwater resources subject to the provisions of this Plan and the Act.

***Explanation.*** *This policy recognises the right of tangata whenua to develop resources in accordance with the Treaty principles. Developments may be based around fresh water resources of significance to the tangata whenua, and must be consistent with provisions of this Plan and the Act.*

- 4.2.7 To encourage and support, where appropriate, tangata whenua participation in monitoring the effects of activities that may potentially adversely affect sites or values of importance to the tangata whenua.

***Explanation.*** *Tangata whenua participation can extend beyond consultation or participation in plan preparation and resource consents to*

*involvement in monitoring the effects of activities on water bodies according to tikanga Maori.*

4.2.8

To have regard to matters raised in an iwi or hapu management plan authorised by the tangata whenua of the Region when assessing resource consent applications.

***Explanation.*** *This policy recognises that from time to time, the tangata whenua may prepare iwi management plans applicable to their particular rohe. An Iwi Management Plan may cover issues wider than the scope of the Act, With respect to the Regional Freshwater Plan, the Council can only have regard to the provisions of the Iwi Management Plan which are relevant to fresh water.*

## Appendix Four

### Regional Freshwater Plan Water Quality Guidelines

AS.1 The following guidelines reflect the minimum water quality standards established in sections 70 and 107 of the Act.

After reasonable mixing, the contaminant, either by itself or in combination with other contaminants, is not likely to cause any of the following effects:

- (1) The production of conspicuous oil or grease films, scums or foams, or floatable or suspended materials.
- (2) Any conspicuous change in the colour or visual clarity.
- (3) Any emission of objectionable odour.
- (4) The rendering of freshwater unsuitable for consumption by farm animals.
- (5) Any significant adverse effects on aquatic life.

AS.2 The following guidelines reflect the water quality standards in the Third Schedule of the Act regarding water managed for aquatic ecosystem purposes.

After reasonable mixing, the contaminant, either by itself or in combination with other contaminants, is not likely to cause any of the following effects:

- (1) All those effects in 8.1.
- (2) The natural temperature of the water shall not be changed by more than 3° Celsius.
- (3) The following shall not be allowed if they have an adverse effect on aquatic life:
  - (a) Any pH change:
  - (b) Any increase in the deposition of matter on the bed of the water body or coastal water:
  - (c) Any discharge of a contaminant into the water.
- (4) The concentration of dissolved oxygen to fall below 80% of saturation concentration.
- (5) There shall be no undesirable biological growths as a result of any discharge of a contaminant into the water.



A8.3 The following guidelines reflect the water quality standards in the Third Schedule of the Act regarding water managed for aquatic ecosystem and **contact** recreation purposes.

After reasonable mixing, the contaminant, either by itself or in combination with other contaminants, is not likely to cause any of the following effects:

- (1) All those effects in A8.1.
- (2) All those effects in A8.2
- (3) The visual clarity of the water to be so low as to be unsuitable for bathing.
- (4) The water to be rendered unsuitable for bathing by the presence of contaminants.
- (5) The presence of undesirable biological growths as a result of any discharge of a contaminant into the water.

A8.4 The following guidelines reflect the water quality standards in the Third Schedule of the Act regarding water managed for aquatic ecosystem and fishery purposes.

After reasonable mixing, the contaminant, either by itself or in combination with other contaminants, is not likely to cause any of the following effects:

- (1) All those effects in A8.1.
- (2) All those effects in A8.2.
- (3) The natural temperature of the water –
  - To be changed by more than 3° Celsius; and
  - To exceed 25° Celsius.
- (4) The concentration of dissolved oxygen to fall below 80% of saturation concentration.
- (5) Fish to be rendered unsuitable for human consumption by the presence of contaminants.

A8.5 The following guidelines reflect the water quality standards in the Third Schedule of the Act regarding water managed for aquatic ecosystem and fish spawning purposes.

After reasonable mixing, the contaminant, either by itself or in combination with other contaminants, is not likely to cause any of the following effects:

- (1) All those effects in A8.1.

- (2) All those effects in A8.2.
- (3) The natural temperature of the water to be changed by more than 30 Celsius. The temperature of the water to adversely affect the spawning of specified fish species (either Brown Trout, *Salmo trutta*, or Inanga, *Galaxias maculatus*) during the spawning season.
- (4) The concentration of dissolved oxygen to fall below 80% of saturation concentration.

## **Appendix Five**

### **Estimate of protozoa concentrations downstream of the supernatant discharge**

COPY

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ceh\letters\ltr090200-hv health-wainuiomata wtp supernatant-ajm

9 February 2000

Mr Andrew Bichan  
Co-ordinator, Environmental Health  
Hutt Valley Health  
Hutt Hospital  
Private Bag 3 1-907  
LOWER HUTT

Dear Andrew

### **Wainuiomata Water Treatment Plant : Supernatant Management**

Following your request at the Consent prehearing meeting on 3 February 2000 I have made some estimates of the likely protozoa concentrations downstream of the discharge point under various scenarios. Because the test data is limited and the results show a wide variation, the estimates set out below should be viewed as indicative only.

#### **Scenario 1: Average or Typical Conditions**

##### ***Flow***

Average river flow at Manuka Track	897 L/sec
Average take (98-99) 13.17 MLD	152 L/sec
River flow upstream of discharge point	745 L/sec
Supernatant Discharge (about 10 times per day for 5 minutes)	50 L/sec

##### ***Protozoa***

Typical number of <i>Giardia</i> cysts in raw water (mean value from table 4 PD report)	2.75 per 100 L
Typical number of <i>Cryptosporidium</i> oocysts in raw water (mean value from table 4 PD report)	2.25 per 100 L
Supernatant <i>Giardia</i> (refer to figure 4 in PD report)	1X per 100 L
Supernatant <i>Cryptosporidium</i> oocysts (estimated)	5 per 100 L

**Concentration Calculation**

	Flow (L/sec.)	<i>Giardia</i>		<i>Cryptosporidium</i>	
		Concentration (cysts per 100 L)	Passing in 1 Second	Concentration (cysts per 100 L)	Passing in 1 Second
River	745	2.75	20.49	2.25	16.76
Supernatant	50	18	9	5	2.5
Totals	795		29.49		19.26
After mixing	795	3.71		2.43	
Increase		<b>+ 35%</b>		<b>+ 0 %</b>	

NB: These increases only occur for short (approximately 5 minutes) periods

**Scenario 2: High River Flows/High Demand****Flow**

Flow at Manuka track exceeded 13% of the time (Mike Ede) 1,454 L/sec

(Analysis of supernatant quality suggests that the turbidity will exceed 6 NTU and all supernatant discharged to the river 13 percent of the time.)

Water take (high demand) 50 MLD 578 L/sec  
 River flow upstream of discharge point 876 L/sec  
 Supernatant Discharge (Assuming maximum flow discharged continuously) 50 L/sec

**Protozoa**

Typical number. of *Giardia* cysts in raw water (average of two figures in table 4 of PD report) 55 per 100 L

Typical number of *Cryptosporidium* oocysts in raw water (average of two figures in table 4 of PD report) 31 per L

Supernatant *Giardia* (refer to figure 5 in PD report) 10 per 100 L

Supernatant *Cryptosporidium* oocysts (estimated) 5 per 100 L

**Concentration Calculation**

	Flow (L/sec.)	<i>Giardia</i>		<i>Cryptosporidium</i>	
		Concentration (cysts per 100 L)	Passing in 1 Second	Concentration (cysts per 100 L)	Passing in 1 Second
<b>River</b>	876	55	482	31	271.6
Supernatant	50	10	5	5	2.5
Totals	<b>926</b>		<b>487</b>		274.1
After mixing	926	52.6		29.6	
Increase		<b>+ 4.4%</b>		<b>-4.5%</b>	

**Scenario 3: Low River Flows****Flow**

Minimum river flow upstream of discharge point 100 L/sec  
 Supernatant discharge (about 5 times per day for 5 minutes) 50 L/sec

**Protozoa**

Estimated number of *Giardia* cysts in raw water at low flow 2.75 per 100 L  
 Estimated number of *Cryptosporidium* oocysts in raw water 2.25 per 100 L  
 Supernatant *Giardia* (refer to figure 4 in PD report) 18 per 100 L  
 Supernatant *Cryptosporidium* oocysts (estimated) 5 per 100 L

**Concentration Calculation**

	Flow (L/sec.)	<i>Giardia</i>		<i>Cryptosporidium</i>	
		Concentration (cysts per 100 l)	Passing in 1 Second	Concentration (cysts per 100 l)	Passing in 1 Second
River	745	2.75	2.75	2.25	2.25
Supernatant	50	18	9	5	2.5
Totals	795		11.75		4.75
After mixing	795	<b>7.83</b>		<b>3.17</b>	
Increase		<b>+185%</b>		<b>+41%</b>	

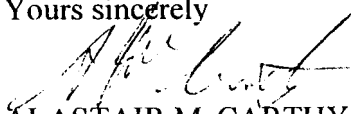
**NB:** These increases only occur for short (approximately 5 minute) periods

**Discussion**

The above calculations show that, for the short time during which supernatant is being discharged, significant increases in protozoa concentrations downstream may occur when the river is low. However, the discharge is only for five minutes and, during summer conditions of clean water and low production, will occur only a few times a day. If there are five discharges of five minutes, this would represent 1.7 percent of the time.

Further dilution over time will occur, as the river flows over riffles and through ponds. How much is difficult to estimate. If the effect of the Scenario 3 discharge is spread over a full day, the increase in *Giardia* levels would be 4.6% and that for *Cryptosporidium* 1%.

Yours sincerely

  
 ALASTAIR McCARTHY  
 Asset and Quality Manager

Copies to:

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 Chris Laidlow, Production Manager, Operations Group