BEFORE THE SOUTHLAND REGIONAL COUNCIL

In the matter of	the Resource Management Act 1991
And	
In the matter of	an application for various resource consents application by Alliance Group Limited with respect to the ongoing operation, upgrading and maintenance of its Lorneville Plant, Southland

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STATEMENT OF EVIDENCE BY JOHN CLIFFORD KYLE

04 July 2016

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1. INTRODUCTION

Qualifications and Experience

1.1 My name is John Clifford Kyle. I hold an honours degree in Regional Planning from Massey University, obtained in 1987. I am a Partner and a Director of the firm Mitchell Partnerships, which practices as a planning and environmental consultancy throughout New Zealand, with offices in Auckland, Tauranga and Dunedin.

1.2 I have been engaged in town and country planning and resource and environmental management for twenty nine years. My experience includes a mix of local authority and consultancy resource management work. Since 1994, I have been involved with providing consultancy advice with respect to Regional and District Plans, designations, resource consents, environmental management and environmental impact assessments. This work includes extensive experience with large-scale consenting projects involving inputs from a multidisciplinary team.

1.3 An outline of projects in which I have been called upon to provide resource management advice in recent times is included as **Appendix A**.

1.4 While I accept that this is not an Environment Court hearing, I have read and agree to comply with the Environment Court's Code of Conduct for Expert Witnesses contained in the Practice Note 2014. I confirm that the issues addressed in this brief of evidence are within my area of expertise. I have not omitted to consider material facts known to me that might alter or detract from the opinions that I express here.

1.5 My involvement in the consent applications for the ongoing operation, upgrading and maintenance of Alliance Group Limited (Alliance) Lorneville Meat Processing Plant (the Plant) commenced in 2012, when my firm was asked to undertake a planning assessment and then later to assist in the preparation of the Assessment of Environmental Effects (AEE) for the various consents being sought. I have visited the Plant on numerous occasions and I am familiar with the processing operations and wastewater treatment plant. I am also familiar with the relevant operative and proposed Regional Plans and District Plans that apply.

1.6 In this statement of evidence I will provide:

(a) An overview of the application;

(b) Some comment on matters raised by the section 42A report writer and submitters with a focus on the key issues raised;

(c) An assessment of the consents being sought in a statutory context;

(d) An assessment of the validity and appropriateness of the recommended conditions.

2. THE APPLICATION

2.1 The details of the application and technical assessments that were prepared in support of Alliance's application for resource consent are primarily described in the evidence of Ms Wise, Mr Khan, Dr James and Mr Cudmore. A full description is contained in Chapter 1 of the AEE. Mr Khan also describes in some detail the proposed Plant upgrades that are to occur as part of these consent applications. In the interests of brevity I rely on these descriptions. However to provide context, I provide a brief summary of the consents being sought below.

2.2 The application seeks to provide for discharges to water, land and air arising from the ongoing operation, upgrade and maintenance of Alliance's Lorneville Plant. A water permit to abstract water from the Oreti River is also being sought.

Discharges to Water

2.3 The discharge to water (via the Boiler Ditch to the Makarewa River) arises from the need to dispose of treated effluent from the Plant operations and domestic sewage from Wallacetown (that is also treated by the Plant). Alliance's current consent conditions (specifically condition 2 of Discharge Permit 92195) require that the discharge into the Makarewa River does not exceed a volume of 22,730m^3/day. The same discharge limit (22,730m^3/day) is being sought by this application. The main discharge period typically starts around two weeks after commencement of the processing season after the wastewater treatment ponds levels have increased. The discharge is not continuous during the processing season and is closed at times during the season due to limitations created by low

flows within the Makarewa River. The main discharge period typically ceases about four weeks after the processing season finishes, but the discharge may occur intermittently after this time.

2.4 Consent to discharge treated effluent to water and to land where it may enter water is being sought as a discretionary activity pursuant to Rule 2(b) of the Southland Regional Water Plan.

Discharges to Land

2.5 Discharges to land at the Plant arise from:

(a) Treated wastewater to land via an irrigation system[1];

(b) Temporary storage of wastewater during emergency conditions;

(c) Disposal of dewatered solids from the Biological Nutrient Removal Plant (BNR Solids) post-upgrade of the wastewater treatment system to land and to an on-site monofill[2]; and

(d) Discharge of stockyard solids to an on-site monofill.

2.6 As part of the existing wastewater treatment process it is proposed that up to 3000m^3/day of treated wastewater may be discharged onto farm land owned by Alliance. Around 80ha of land is available for irrigation purposes. Discharge is accomplished via a K-line pod irrigation system and is used periodically as part of the current wastewater treatment disposal process in order to reduce the extent of the discharge of treated effluent to water. This consent is necessary, until such time as the proposed progressive upgrades to the wastewater treatment plant are completed.

2.7 Alliance is also seeking consent for the temporary storage of wastewater on land. This is only likely to occur during an extreme summer drought when farmers are forced to de-stock their farms and discharges to the Makarewa River cannot occur due to low flows within the river.

2.8 As described in the evidence of Ms Wise and Mr Khan in particular, Alliance is proposing to progressively upgrade its existing wastewater treatment plant by installing a BNR system that will (amongst other things) produce

[1] As per the existing wastewater treatment system.
[2] Will occur as a result of the upgraded wastewater treatment system.

dewatered solids that will need to be managed on-site, or removed. New consents, as explained below, are being sought to enable the discharge of dewatered BNR solids to land and to an on-site monofill post the upgrade.

2.9 Consent to discharge treated effluent to land is being sought as a discretionary activity pursuant to Rules 2(b) and 56 of the Southland Regional Water Plan, and Rule 5.5.1 of the Southland Regional Effluent Land Application Plan.

Discharges to Air

2.10 Discharges to air arise from:

(a) Discharges from two coal fired boilers;

(b) Discharges of odour associated with operations at the Plant including stockyards, rendering and fellmongery processes;

(c) Discharges of odour associated with the existing wastewater treatment system; and,

(d) Discharges of odour associated with the upgraded wastewater treatment system and the disposal of biosolids.

2.11 Mr Cudmore explains that two coal fired boilers provide steam to maintain Plant hot water supplies and for steam requirements in processes such as rendering. Lignite coal is currently sourced from Solid Energy's New Vale Mine. The boilers produce hot exhaust air streams containing combustion products and particulates. The individual boiler plants operate at varying rates throughout the day and year, relative to the processing occurring at the Plant.

2.12 Odours from the site can originate from on-site processes including blood processing, rendering, fellmongery and soup stock facilities, as well as the stockyards.

2.13 Odours can also arise from the existing wastewater treatment facility. The existing wastewater treatment facility has an initial anaerobic pond stage which removes in excess of 80% of the inlet organic material. This is followed by treatment within mechanically, then naturally, aerated ponds, before discharging to the Makarewa River. The anaerobic pond is the main

potential source of odour arising from the existing wastewater treatment facility.

2.14 Odours could also be generated from the proposed upgrade to the wastewater treatment facility referred to above and discussed in detail in the evidence of Mr Khan. Odour could arise from the treatment facility as well as the disposal of BNR Solids to land and to an on-site monofill.

2.15 Consent to discharge contaminants and odour to air is being sought as a discretionary activity pursuant to Rule 5.5.2 of the Southland Regional Air Plan.

Water Take and Channel Maintenance

2.16 Alliance is proposing to abstract water from the Oreti River up to 22,500m^3/day. Access to water is necessary as it is an essential component of a number of on-site plant processes including:

(a) Stock washing;

(b) Stock drinking;

(c) Wash down;

(d) Potable on-site uses;

(e) Cleaning; and,

(f) Fellmongery processes.

2.17 To meet the demands for water on-site, Alliance has two resource consents for abstraction of water from the Oreti and Makarewa Rivers. First priority is given to abstraction from the Oreti River, with the Makarewa River supply only required in peak production periods, or as a contingency supply should the Oreti River intake structure or pump fail. It is noted that the Makarewa River consent does not expire until 2037, so renewal of this consent is not being sought at this time. The Oreti consent does not expire until 2027, however because this abstraction is an integral component of the Plant's operations, consent for it is being sought now in order to align all of the Plant's key consents. If consent is granted for the proposed water abstraction it will not commence until the existing consents for the Oreti abstraction (203358 and 201227) are surrendered.

2.18 Alliance is seeking consent to continue to abstract water from the Oreti River of up to 22,500m^3/day, with a maximum rate of 260 L/s. The current consent is not subject to any minimum flow conditions, and this is appropriate given the essential nature of the take. Access to a continued water supply is critical for the processing plant to operate, and is particularly necessary during times of drought conditions when animal welfare is important. There is however a requirement to introduce water conservation measures when flows become low in the river at the Wallacetown water level recorder. In response, Alliance has prepared a low flow contingency plan which requires that water conservation measures commence at certain river flow trigger levels.

2.19 Consent to abstract water from the Oreti River is being sought as a discretionary activity pursuant to Rule 18(e) of the Southland Regional Water Plan.

2.20 Alliance is also seeking consent to undertake maintenance works within the abstraction intake embayment area. The embayment area is approximately 45m long, and needs to be cleared annually to ensure that the intake structure is free from gravel and debris. Additional clearance might also be required after a flood event. Consent to undertake works within the bed of the river for this maintenance activity is being sought pursuant to Rule 47 of the Southland Regional Water Plan.

District Plan Considerations

2.21 The majority of the Plant and wastewater treatment ponds are within the jurisdiction of the Southland District Council. In terms of the Southland District Plan, the Lorneville Plant is specifically provided for and industrial activities are permitted on the site. No consents are being sought from the Southland District Council.

2.22 Land to the south of Crowe Road is within the jurisdiction of the Invercargill City Council (ICC). The site of the temporary wastewater storage facility and area of land where wastewater is discharged is zoned Rural in the Invercargill City District Plan. In the Rural zone, industrial activity is a restricted discretionary or discretionary activity. The Invercargill City District Plan defines industrial activity as including the storage, treatment or

disposal of waste. Therefore the storage and discharge of wastewater associated with the Plant requires resource consent as a discretionary activity. For this reason Alliance holds two consents from ICC:

(a) To operate a temporary dam for storage of treated wastewater at 223 Crowe Road, Invercargill; and

(b) To discharge treated wastewater to land on a temporary basis at 159 Crowe Road, Invercargill

2.23 Alliance requires these consents when low flow conditions in the Makarewa River cause its discharge of treated wastewater to the river to be restricted or to cease. The consents enable the Plant to remain operational and provide for the increased demand during such conditions. The consent to operate a temporary storage dam was issued by the ICC with an expiry date of August 2016 and therefore a new consent will be required at this time.

2.24 It should be noted that ICC is currently reviewing its District Plan. Alliance has sought, via a submission on the Proposed District Plan, to have its land within the jurisdictional boundary of the ICC rezoned to Industrial. This would align Alliance's land holdings with an overall industrial zoning, and potentially permit the use of this land for the storage of wastewater during emergency conditions. Decisions on submissions on the Proposed District Plan are expected later in the year. Depending on the outcome of that process Alliance will then consider any necessary approvals required from the ICC. In other words, consent is not currently being sought from the ICC at this time in the hope that the Proposed District Plan will include rules which properly recognise the existing activities.

Consent Structure and Consent Term

2.25 As explained in the evidence of Ms Wise and Mr Khan, Alliance intends to progressively upgrade its existing wastewater treatment plant. This has implications for the nature of the consents being sought and how the consents are likely to be ultimately structured.

2.26 As discussed above, Alliance discharges some of its wastewater to the Makarewa River, and some via irrigation to its land. This regime will continue until such time as the wastewater treatment upgrade technology is confirmed, implemented and the upgrade is completed, tested and finally commissioned. At that time Alliance will no longer dispose of wastewater to land via irrigation and will instead dispose dewatered BNR solids to land. Alliance has sought that all of the discharge-related consents are issued with a 35 year consent term, with the discharge of BNR solids to land commencing once the irrigation consent has been surrendered.

2.27 The 35 year term is sought to suitably recognise the existing asset value of the Plant, the essential nature of the activity as a service to the rural sector, existing investment in processing and environmental management infrastructure, and the significant economic contribution the Plant provides to the Southland region and New Zealand. Moreover, Alliance is committed to significant expenditure to upgrade its wastewater treatment system, thereby improving water quality over the long term consistent with regional and national directives. In my opinion, this commitment requires a consent term long enough to enable the upgrades to be subject to a comprehensive engineering planning and design process, and for monies to be set aside for the progressive implementation of the capital works to occur. The investment is a significant one for Alliance and its shareholders and it seeks a 35 year term to allow the considerable financial investment to be justified and recovered over an appropriate timeframe.

2.28 I note that two submitters on the application have expressed concern about the duration of the consent term, particularly with respect to the discharge to water consent being sought by Alliance. Te Ao Marama has stated a preference for a 25 year consent term, and Fish and Game has identified that a five year consent term would be more appropriate.

2.29 Environment Southland has also commissioned the preparation of a section 42A report. This report was prepared by Ms Smith. With regard to the wastewater discharge and air discharge consents being sought, Ms Smith recommends that a five year consent term is appropriate. For the temporary storage discharge and irrigation discharge, Ms Smith recommends a consent term of no more than 15 years, and a 20 year

permit for the abstraction permit. Ms Smith recommends the decline of the BNR discharge to land on the basis that it will not be required with only a five year consent term for the wastewater discharge. It is clear from the report, that Ms Smith holds the view that the proposed wastewater treatment plant upgrade (and upgrades relating to air emissions control technology) should occur sooner than is proposed by the Applicant. Insofar as the wastewater discharge consent is concerned, Ms Smith has stated that:

> *"Both submitters and the Council have issues with the long timeframe for the treated wastewater discharge upgrade (15 years before it is fully implemented) in which no improvement in discharge quality will occur beyond what is currently being discharged. This is of particular concern.*
>
> *I hold concerns as to the lack of improvement in receiving water quality after the applicant's proposed upgrade is completed, especially in relation to national and regional policy requirements in respect of water quality. Downstream receiving water quality is likely to be maintained but the application does not provide certainty that it will be improved above "bottom line" requirements.*
>
> *I would therefore recommend granting of the discharge of treated wastewater to water consent for a term of five years, with conditions similar to those on the current consent. This would allow the applicant to confirm its proposed upgrading option and subsequently provide an application which fully outlines the effects of the selected option, along with the evidence that the chosen option will be able to improve downstream water quality in the receiving environment and meet the requirements of national and regional policy directives (including provision for changes to be made to the chosen option when catchment limits are imposed)."*[3]

2.30 With respect, this reflects a fundamental misunderstanding about what is proposed on the part of Ms Smith. Proposed conditions 12 to 16 of the treated wastewater to water consent clearly set out the consent holder's obligations to plan and undertake a comprehensive wastewater treatment upgrade sufficient to meet a range of new compliance limits. These compliance limits mean that the quality of the discharge will need to be

[3] Page 67 of the section 42A report.

significantly improved such that water quality in the receiving environment is considerably enhanced. For this reason, I do not understand how it is that Ms Smith can seemingly have concern "*as to the lack of improvement in receiving water quality after the applicant's proposed upgrade is completed*". I address this matter in greater detail later in this evidence.

2.31 In addition, a five year consent limit on the key discharge consents for the Plant would create significant uncertainty for the Company. Given the range of tools available under the RMA to address any potential effects, the use of a shortened consent term as proposed by Ms Smith is lacking in appropriate balance. In particular, such a response has little or no regard for the extent of investigation that has been undertaken, the outcome of the assessment findings and commitment Alliance has made to improve its discharges.

2.32 Appropriate and realistic resource consents for an adequate time period that provide security of tenure are critical in enabling the necessary financial investments in operational infrastructure to be made and recovered over an appropriate financial timeframe, and to enable research efforts and commitment to technology upgrades to be justified. The imposition of a five year consent term, as proposed by Ms Smith, would provide a significant barrier to securing investment and could potentially result in the closure of the Plant.

2.33 I do not agree that a reduced consent term, particularly of a duration of only five years is appropriate in these circumstances. Limiting the term in such a way has no regard for the following:

(a) The nature and extent of effects arising from the current discharges to water, land and air, and the water abstraction are monitored and well understood and there is no uncertainty as to what the actual or potential effects arising from the current situation are. Thus there is no need for a precautionary approach to be adopted;

(b) The Plant is a significant physical resource contributing to the social and economic benefit of the community, is within land that is zoned for industrial purposes under the Southland District Plan and

significant investment in existing infrastructure already exists at the site. I further note that section 104(2A) requires the decision maker to have regard to the value of the investment of existing consent holders where a consent holder is applying for a replacement consent. It is evident that with respect to the Plant this is significant. While Ms Smith acknowledges the requirement of section 104(2A) it is hard to understand how that has influenced her recommendation given the very short term consent she proposes. In my opinion a consent term of 35 years provides sufficient certainty to justify investment in a major industrial activity which brings significant social and economic benefits to the Southland region and community, and which in many ways provides an essential service to the rural sector;

(c) As indicated above, Alliance is committed to ensuring the current quality of its discharges to air, land and water are improved through progressive upgrades to technology and management practices employed on site. This is consistent with the national and regional policy framework which I discuss in more detail later in this evidence. Alliance's commitment to improving the quality of its discharges is evident with respect to the primary upgrades already undertaken for the wastewater treatment system, changes to the outfall structures, and the installation of a new multi-clone grit arrestor system on one of the Plant boilers. Notably none of these upgrades have been properly recognised by Ms Smith in her reporting;

(d) As I explain in section 3 of my evidence, the management of Alliance's discharges to air, land and water and the mitigation measures proposed are consistent with meeting the best practicable option (BPO);

(e) Overall it is my view that the mitigation and conditions (attached as **Appendix B**) proposed include robust environmental limits within which the Plant must operate, introduce a range of robust environmental process standards to require and manage progressive emission control upgrades through the term of the consent and ensure that the environmental effects of the Plant operations are

appropriately avoided, remedied or mitigated, commensurate with emergent environmental policy initiatives.

3. ISSUES RAISED IN THE S42A REPORT AND SUBMISSIONS

Submissions

3.1 As outlined in the section 42A report, a total of six submissions were received. Three of the submissions received were in support of the consents, Public Health South was neutral in its submission, Te Ao Marama Inc for Te Runanga O Waihopai (TAMI) were in opposition to the 35 year consent term that is being sought, and Fish and Game opposed the discharge to water and land consents, as well as the proposed abstraction from the Oreti River. Notably there were no submissions in opposition to the air discharge that is being sought.

3.2 The submission from Fish and Game raises a number of points relating to each consent that is being sought, aside from the discharge to air. A matter presented in the submission and one which was also raised by Ms Smith in the section 42A report, is the question as to why Alliance is not applying the water quality standards contained within the National Policy Statement for Freshwater 2014 (Freshwater NPS) now and why a delay of 15 years until compliance with the post upgrade limits is appropriate.

Discharge Limits

3.3 Dr James and Dr Fitzpatrick have explained the rationale behind the discharge and receiving water limits that are proposed for Alliance's point source discharge into the Makarewa River.

3.4 As outlined in the evidence of Ms Wise and Mr Khan a progressive wastewater treatment upgrade is proposed. The purpose of the upgrade will be to deliver a significant reduction of nitrogen, specifically a 75% reduction in ammoniacal nitrogen concentration in the treated wastewater discharged to the receiving Makarewa River from (at the latest) Year 15 of the consent.

3.5 In addition to this comprehensive upgrade, Alliance has already commenced with implementing measures to effect an improvement in the quality of its discharge by reducing the load of nitrogen. The separation and further treatment of high nitrogen loaded waste streams is referred to by Ms Wise. It is apparent from monitoring data obtained since this upgrade was made that this has been successful in achieving a reduction in the nitrogen load. This is an important first step in enhancing water quality in the receiving waters.

3.6 Given the results of recent monitoring, it is now feasible to confidently propose more stringent limits on the discharge in the interim period, which would apply between the issuance of consent and the 15 year mark. The conditions attached to this evidence as **Appendix B** set out these interim limits. These are discussed further by Ms Wise and Dr James and Dr Fitzpatrick, in particular.

3.7 The Freshwater NPS requires Regional Councils to proactively manage water quality in catchments, to do so within a standardised transparent framework and to improve water quality. The Freshwater NPS establishes "national bottom line" values specified for certain water quality parameters for the following:

(a) Periphyton (trophic state).

(b) Nitrate (toxicity).

(c) Ammonia (toxicity).

(d) Dissolved oxygen.

(e) Escherichia coli.

(f) Cyanobacteria – planktonic.

3.8 The Freshwater NPS requires that Council implement a framework to achieve these environmental bottom lines within Freshwater Management Units (FMU) by 2025, or 2030 at the latest.

3.9 Policy CA2(f)(ii) of the Freshwater NPS requires Councils to consider *the spatial scale at which FMUs are defined*, and guidance suggests that a FMU should not be set at such a large scale that effective management of

freshwater is inhibited, or water quality is disguised by averaging[4]. It also notes that Freshwater Management Units should not be set at too small a scale, which may result in a costly planning process and undue complexity in the plan (e.g. multiple limits affecting infrastructure or commerce which spans a water body or water bodies)[5]. It is therefore unlikely that the bottom line limits contained in the Freshwater NPS will be applied such that limits will apply directly to individual point source discharges.

3.10 Environment Southland has indicated as part of its initiative known as Water and Land 2020 & Beyond, that FMUs are likely to comprise of defined catchments. Thus catchment based limits for water quality and quantity will be set. With respect to the Oreti catchment (which includes the Makarewa River), limits are likely to be established by 2020 via the regional plan. This coincides with the timeframes set out within the Freshwater NPS, which requires Councils to have a programme in place to comply with the national bottom line limits by 2025 (or 2030). Importantly, it is my understanding that the 2025 (or 2030) requirement is only to have a programme to comply in place. It is not a necessary requirement to achieve compliance with the national bottom line limits within that timeframe.

3.11 Given that the limits for the Oreti River catchment have been not yet been developed by Environment Southland, Alliance has adopted a conservative approach and worked with its technical advisors to develop specific water quality targets, taking into account current water quality standards (Regional Water Plan, ANZECC) and likely future obligations (i.e. Freshwater NPS) that will likely apply at the FMU (or catchment) scale.

3.12 As explained in the evidence of Dr James and Dr Fitzpatrick a site specific in-river ammonia target has been derived for Alliance's discharge, to be achieved in the Makarewa River after reasonable mixing has occurred.

3.13 To achieve this limit, Alliance will need to treat the discharge to deliver a reduction of approximately 75% of ammonia nitrogen (from 2012/2013 processing season concentrations). In order to achieve this target a comprehensive wastewater treatment upgrade is proposed. Given that

[4] A Guide to the National Policy Statement for Freshwater Management 2014, page 64.
[5] Ibid.

there is no evidence that the current discharge is having an adverse effect on any species likely to be found within the receiving river environment, the fact that new, interim limits are proposed and it will take some time for limits to be imposed within the FMU (and in turn for these limits to affect a change on water quality in the catchment), Alliance is proposing to make progressive technological improvements so as to achieve this target reduction within 15 years of a consent being granted.

3.14 Dr James considers that the proposed interim (reduced) and future limits are likely to maintain and enhance water quality in the immediate receiving environment and will assist in meeting the future water quality targets set by the Freshwater NPS and Environment Southland for the Oreti River catchment.

3.15 As outlined in the evidence of Mr Khan, the capital cost to install the remaining necessary emissions control technology is significant, and therefore Alliance proposes to implement this progressively. In my view the progressive implementation programme takes into account the level of effects arising from the current discharge quality, and will align with the requirements of the Freshwater NPS, and enable Alliance to undertake the necessary research efforts into suitable technology, undertake detailed design of the facility and financially commit to the comprehensive upgrades without jeopardising the current economic viability of the Plant.

3.16 This approach for the upgrade therefore represents the best practicable option (BPO) for managing the current and future discharges to the Makarewa River in my view.

Best Practice vs Best Practicable Option

3.17 As noted above a progressive implementation programme for the wastewater treatment plant upgrade, and adherence to revised water quality limits in the Makarewa River at year 15 of the consent is in my view considered to represent the BPO. Alliance is also proposing a reduction of its PM_{10} compliance limit for its air discharges within five years. This has also been assessed as achieving the BPO.

3.18 A common thread in both the section 42A report and in the Fish and Game submission is that Alliance should be adhering to “best practice” for the management of its proposed discharges to water, land and air. In my view the requirement to achieve “best practice” is in fact

3.19 a different obligation to achieving the BPO as I explain below.

3.20 The “best practicable option” is defined in section 2 of the RMA as follows:

> *“Best practicable option, in relation to a discharge of a contaminant or an emission of noise, means the best method for preventing or minimising the adverse effects on the environment having regard, among other things, to—*
>
> *(a) The nature of the discharge or emission and the sensitivity of the receiving environment to adverse effects; and*
>
> *(b) The financial implications, and the effects on the environment, of that option when compared with other options; and*
>
> *(c) The current state of technical knowledge and the likelihood that the option can be successfully applied.”*

3.21 Under the RMA’s statutory framework, the BPO is specifically relevant in the context of resource consent conditions for discharge permits. Section 108 of the RMA provides that a resource consent can include conditions requiring the holder to adopt the BPO to prevent or minimise adverse effects resulting from the discharge. Such a condition can only be imposed if it is considered to be the most efficient and effective means of preventing or minimising such adverse effects, after having regard to the nature of the discharge and receiving environment and other alternatives.

3.22 In addition to these requirements under the RMA, the Freshwater NPS Policy A3, requires regional councils, where permissible to make rules requiring the adoption of the best practicable option to prevent or minimise any actual or likely adverse effect of a contaminant into freshwater. I have reviewed the operative and proposed regional plans in this regard, and while the Regional Water Plan and the Proposed Land and Water Plan contain some references to “best management or environmental practices” and the “best practicable option” there is no mandatory obligation within any of the relevant objectives, policies or rules that either of these

approaches be adopted[6] with respect to the discharges that are being proposed[7].

3.23 BPO requirements therefore derive primarily from section 108 of the RMA.

3.24 Determining what the BPO is in a given circumstance requires a decision maker to weigh competing considerations, including the nature of the discharge, sensitivity of the environment and practicalities of that and any other option. The use of the words "among other things" clearly signals that other factors can also be taken into consideration.

3.25 As noted in the quote below the words 'BPO' do not mean the best option, the best technical option, the best economic option, or the best environmental option. Nor do they require adherence to what might be considered "best practice". A judgement needs to be made as to what is practicable and proportionate to the risks likely from a contaminant to be discharged. The key word is ***practicable*** and in my opinion resource consents should not be granted requiring adherence to an option that would be prohibitively expensive or involve procedures that are unnecessarily onerous or impractical.

3.26 These considerations have been summarised by Dr Royden Somerville QC in his paper "How to give effect in regional plans to the National Policy Statement for Freshwater Management 2011", dated 20 January 2012:

> *"The words 'best practicable option' do not mean the best option, the best technical option, the best economic option, or the best environmental option. A judgement needs to be made as to what is practicable and proportionate to the risks likely from a contaminant. The Shorter Oxford English Dictionary defines "practicable" as "capable of being carried out in action; feasible".*
> *In Medical Officer of Health v CRC, it was held that "practicable" is the key word in the definition of BPO, and it would be wrong to impose conditions which afforded the holder no practical means of compliance.*

[6] Is referred to as being a requirement of non-regulatory methods, and will be considered with respect to the imposition of financial contributions.

[7] For example - Objective 4 of the Water Plan seeks **to encourage** "best environmental practice" to improve water quality over time and Policy 36 requires the adoption of the best practicable option to manage the discharges relating to hazardous substances.

The words "among other things" in the definition do not limit the considerations a regional council may address, to those matters in paras (a), (b) and (c).

The matters in paragraphs (a), (b) and (c) are relative. This approach reflects the "principle of proportionality" which allows for a dilution of absolute standards and is used in European community law. Some overseas jurisdictions put more emphasis on technical options for addressing pollution. This is sometimes known as a technologically forcing regulatory approach. The BPO is the optimum combination of all methods to manage the risk of an adverse environmental effect to the greatest extent practicable. It is necessary to consider the options and financial implications when determining how best to attain the BPO.

Thus, what constitutes the BPO in any given case is a question of fact and degree. Regard is to be had primarily to all three subsections (a), (b) and (c) of the definition, although one or more may be given more weight than others in any given case. The environmental performance targets being aspired to by using the BPO should be set out in the documentation."

3.27 An assessment of BPO with regard to the proposed discharges is contained in Chapter 9 of the AEE. With respect to the proposed discharges to air and in particular the discharge of particulate contaminants, it is considered that what is proposed (i.e. maintaining status quo with a reduction in particulate discharges in five years' time) represents the BPO. This is on the basis that the current discharge is achieving national regulatory standards and guidelines, there is a considerable buffer between the Plant and any adjacent sensitive land uses and the cost implications of undertaking the full upgrade to achieve a significant improvement sooner. Mr Cudmore discusses this in his evidence.

3.28 The BPO assessment in the AEE relating to the discharges to water considers that the maintenance of status quo in terms of discharge quantity and working toward a significant improvement in the discharge quality resulting from the proposed wastewater treatment plant upgrade that is proposed, is representative of the BPO. This is based on an assessment of the sensitivity of the receiving environment and impact of the current discharge, the current and likely future national and regional regulatory

requirements, as well as the capital costs to install the necessary technology.

3.29 As outlined in the evidence of Dr James, achieving any improvement in water quality with regard to the Plant is likely to only occur in a confined area of the river, and any observable effect will only be seen alongside a total catchment improvement. It is therefore considered that there would be very little environmental benefit or mitigating effect achieved if Alliance were forced to adhere to the post upgrade water quality standards in the short term. Having said that, it is acknowledged that the initial treatment upgrades that have been installed at the Plant are achieving a benefit in terms of a reduction in nitrogen load and this reduction should be reflected as interim compliance limits for the discharge to water. This is consistent with the national and regional policy intent to ensure that water quality does not worsen and an improvement is ultimately achieved.

3.30 Alliance is also proposing to undertake periodic reviews of whether its discharges to both air and water are continuing to achieve the BPO. This is proposed as condition 17 and condition 21 of the air and water permits being sought (refer **Appendix B** to my evidence). These reviews will require Alliance to identify if there is a need to implement additional methods for controlling the effects of its discharges to ensure adherence to BPO obligations. This approach recognises that meeting the BPO is a dynamic process because emission and discharge control technology is developing all the time. The results of these reviews are to be reported to the consent authority and it is proposed that this report be certified by the Council once it is satisfied that the review has properly assessed the BPO for providing ongoing emissions control at the site and that any programme of procurement and implementation associated with any required technological upgrades is robust. The consent holder would then be required to implement the recommendations arrived at in any such review.

3.31 Ms Smith is critical of this approach citing that such a condition is considered to be *"a consent within a consent*". I have been involved in a number of large scale infrastructure and industrial projects and it is my experience that environmental process standard based conditions are not at all uncommon. In my opinion it is inappropriate for Ms Smith to dismiss

such conditions on the basis that they will likely result in a *"lengthy debate between the Council and consent holder"*. The approach requires that a review is undertaken by an appropriately qualified and independent person who assesses the BPO, and is tasked with recommending any associated changes to the consent limits that should be made. This process requires the consideration of:

(a) The technical options available for the reduction and treatment in contaminant limits, and sensitivity of the receiving environment (i.e. post implementation of any new catchment limits);

(b) The national and regional standards that are relevant and applicable at the time of the review;

(c) The estimated operational and capital costs associated with the installation and operation of the options;

(d) The practicality of installing and operating each of the options compared to the environment mitigation achieved;

3.32 It is intended to be a robust and transparent review process based on detailed independent advice. These conditions do not allow for any complacency on the part of the consent holder during the term of the consent. Rather they require that the consent holder is dedicated to an ongoing assessment of available technology and national and regional standards, and whether the technology and operational practices employed at the Plant for managing the discharge quality are achieving the BPO. I hold the view that such conditions are rigorous.

3.33 Notwithstanding this, I have given the concerns held by Ms Smith some further consideration and have suggested some further refinement to the conditions in light of these. This is discussed in section 6 of my evidence.

4. STATUTORY ASSESSMENT

4.1 Chapters 5 and 10 of the AEE contain a comprehensive overview and assessment of the relevant operative and proposed resource management plans. Ms Smith has also identified the relevant provisions.

4.2 On 3rd June 2016, the Council notified its Proposed Southland Water and Land Plan. The provisions of this Plan have legal effect and are therefore also a relevant consideration to these applications. Since this Plan was notified post lodgement of the applications, I have undertaken a separate assessment of this Plan which is attached as **Appendix C** to this evidence.

4.3 A summary of the key conclusions from the assessment contained in the AEE and in **Appendix C** of this evidence follows.

Freshwater NPS

4.4 The Freshwater NPS contains two overarching water quality objectives which state:

> ***Objective A1***
>
> *To safeguard:*
>
> *a) the life-supporting capacity, ecosystem processes and indigenous species including their associated ecosystems, of fresh water; and*
>
> *b) the health of people and communities, at least as affected by secondary contact with fresh water;*
>
> *in sustainably managing the use and development of land, and of discharges of contaminants.*
>
> ***Objective A2***
>
> *The overall quality of fresh water within a region is maintained or improved while:*
>
> *a) protecting the significant values of outstanding freshwater bodies;*
>
> *b) protecting the significant values of wetlands; and*
>
> *c) improving the quality of fresh water in water bodies that have been degraded by human activities to the point of being over-allocated.*

4.5 As outlined in the evidence of Dr James, he has assessed that the discharge is not having a significant adverse effect on the quality of water downstream of the Plant, when compared to upstream results. There is a reduction in water clarity downstream of the discharge, however there is no evidence from fish, algae and benthic invertebrate surveys that the discharge is having any adverse effect on downstream water quality such that ecological values are compromised. The monitoring and assessment

of the receiving river environment has also not identified any measurable adverse toxicity effects that are directly attributable to the discharge. The current discharge can elevate faecal bacteria concentrations in the lower Makarewa River on occasions, but in other years it appears to dilute the contamination from microbial sources upstream.

4.6 It is apparent from these assessments that the discharge itself is not having any observable adverse effect on water quality or ecology downstream. If it were proposed to maintain the status quo in terms of discharge quantity and limits, it is unlikely that this would contribute to an adverse effect on the river environment. Having said that, it is acknowledged that there is a mandate within the national and regional policy framework to maintain and enhance water quality.

4.7 I understand that the new framework to give effect to the objectives of the Freshwater NPS has been in part established by the Proposed Land and Water Plan, however work to set in place catchment limits for FMUs has not yet been completed. FMU limit setting will occur within the term of the consents sought. Therefore while a direct assessment of the proposed discharge against the catchment limits is not possible, regard has been had to the requirements of that framework when developing the proposed discharge and receiving water limits that would apply (according to the proposed conditions) post upgrade of the wastewater treatment plant. Given that post upgrade limits have been set within the proposed conditions, I am not at all clear why Ms Smith thinks there is uncertainty about the subsequent improvements in water quality post upgrade. In my opinion the compliance limits set out within proposed condition 15 are very clear. The consent holder will have to apply the necessary technology through the upgrade process to meet these limits within the specified timeframe. As is clear from the evidence of Mr Khan, there is a range of potential engineering solutions that will be available to Alliance to meet the required standards. If Ms Smith's concern is that the conditions do not specify the precise solutions to be used, her concern is misplaced in my opinion. As Mr Khan explains, Alliance will need to go through a process of detailed design and evaluation to determine which solutions represent the BPO to meet the receiving environment standards set by the consent conditions. That is not an unusual situation, and it would be quite

inappropriate in my view for the consent to regulate Alliance's operations by not just specifying what standards needed to be met, but also *how* those standards were to be met.

4.8 It is also significant in my opinion that, Alliance is proposing to impose more stringent water quality limits with regard to ammonia than those that apply now as an interim measure. The proposal in this regard has been set out within the evidence of Ms Wise and Dr Fitzpatrick. The proposal builds on the successful waste stream treatment upgrades recently undertaken, which have also been described by Ms Wise and Mr Khan. This has enabled some refining of the proposed conditions to occur such that new, interim contaminant limits can be imposed. The conditions attached as **Appendix B** of my evidence set these out (see proposed conditions 8 to 11 inclusive).

4.9 Although this interim reduction is significant from a Plant perspective, it is likely to result in only a localised improvement to water quality within the Makarewa River. This is due to the overall quality of the Makarewa River which is currently being highly influenced by other point and non-point source discharge activities within its catchment. Establishing and attaining wider improvements in water quality in the Makarewa River will still rely on a substantial catchment wide reduction in the quantity of contaminants currently discharged. Alliance's proposed timing of its Plant upgrade and subsequent improvement in water quality, would in my assessment, tie in with these catchment wide plans for improving water quality.

4.10 In the above context, I consider that the proposal is consistent with the provisions in the Freshwater NPS.

4.11 The Freshwater NPS also contains objectives and policies relating to water quantity. These seek to sustainably manage the taking, using, damming or diverting of freshwater to safeguard the life supporting capacity, ecosystem processes and indigenous processes; avoid over allocation and improve and maximise the efficient allocation and efficient use of water.

4.12 The current allocation in the Lower Oreti River Catchment is close to 75% of the primary allocation (largely due to the Invercargill City Council water abstraction on the Oreti River). This current allocation includes Alliance's take. As set out in the application, Alliance is not seeking to increase the amount of water that is taken under its current permit and therefore the take will not contribute to the over allocation of surface water resource within the Lower Oreti River. Referring to the evidence of Mr Montgomerie the ongoing abstraction effects on the hydrology of the Oreti River, water quality and aquatic habitat have been assessed and are considered to be minor. I note that Ms Smith and Dr Ryder are generally comfortable with the effects that emanate from the proposed abstraction.

New Zealand Coastal Policy Statement (NZCPS) 2010

4.13 As set out in the AEE[8], the NZCPS 2010 is a relevant consideration on the basis that the ultimate receiving environment of the Plant's discharge to the Makarewa River is the New River Estuary. The Plant's discharge point is also located near the upper end of the tidally influenced section of the Makarewa River. Enhancing water quality in the coastal environment is a requirement of Policy 21 of the NZCPS. The quality of the New River Estuary is being impacted by the cumulative impacts of non-point and point source discharges throughout the catchment. Although Alliance is seeking to improve the quality of its discharge to the Makarewa River this is only expected to have a localised improvement, and in order to see an improvement in the quality of the New River Estuary, a whole-of-catchment improvement is necessary. I note that this is the aim of the regional FMU process that will be implemented by the Council and Alliance is committed to doing its part in this regard.

Regional Policy Statement

4.14 Section 10.5 of the AEE provides an assessment of the proposed activities against the relevant provisions of the Proposed and Operative Regional Policy Statement (RPS) for Southland. Drawing on this assessment it is my opinion that the applications are consistent with the relevant objectives and policies for the following reasons:

[8] Chapter 10, section 10.3.

(a) Considerable effort has been made by Alliance through consultation and the preparation of a cultural values report to understand the cultural values of the area and natural resources affected. As evidenced in the submission from TAMI, a high level of agreement has been reached in terms of the effects identified and the methods to manage these. The only outstanding issue for TAMI is the length of the consent term primarily for the discharge to water consent[9].

(b) The policy direction contained in the Proposed RPS is similar to, and builds on that which is contained in the Freshwater NPS[10] and NZCPS. In this respect, the comments made above in respect of the Freshwater NPS and NZCPS apply to these RPS provisions. Namely that:

(i) A substantial catchment wide reduction in the quantity of contaminants currently discharged will be required to achieve a substantive improvement in water quality in the catchment. A multi-faceted and cross community approach is likely to be necessary to achieve this;

(ii) Alliance is committed to improving the quality of its discharge to water and the current upgrades (complemented with revised interim water quality limits) and the proposed comprehensive wastewater treatment upgrade, to be completed within 15 years of any grant of consent, pre-empts and would fulfil its obligations in respect of any catchment review process for improving water quality.

(c) The discharges of treated wastewater to land are proposed to be undertaken so that the sustainable management of the land and soil resource is achieved[11]. This has included determining the most appropriate nitrogen load and application rates for both the irrigated discharges and application of dewatered solids from the upgraded biological nutrient removal (BNR) plant[12].

[9] Objectives TW.1, TW.2, TW.3, Policy TW.1 of the Proposed RPS.
[10] Objectives WQUAL.1, WQUAL.2, Policies WQUAL.1, WQUAL.2, WQUAL.4 of the Proposed RPS.
[11] Objectives RURAL.1, RURAL.2 of the Proposed RPS.
[12] Refer to the technical assessments in Appendices I, J, and P attached to the application.

(d) The natural hazard risks to the Plant's activities, operations and discharges arise from the risk of drought and flooding[13]. During drought conditions, animal welfare is critical so the Plant has to keep operating. During extreme drought events, low river flows restrict the ability of the Plant to discharge to the Makarewa River, and as such, Alliance has identified that as a short term contingency option it needs to retain the ability to store treated wastewater on land adjacent to the river, and return it to the river when conditions are more appropriate.

(e) The key findings of the air discharge assessment[14], as summarised in the evidence of Mr Cudmore, is that all cumulative ambient contaminant concentrations achieve compliance with all relevant standards and guidelines for air quality beyond the property, at locations where people are likely to be exposed[15]. He accepts however that there is no "safe level" of $PM_{2.5}$ and PM_{10} and therefore Alliance is proposing to further reduce boiler particulate emissions within five years of any consent being granted. In addition at Year 10 of the consent, and five yearly thereafter Alliance is proposing to undertake a comprehensive review of monitoring data, relevant guidelines or standards for discharges to air, and available technology to confirm that the BPO for the control of emissions to air from the discharge sources at the site is being achieved[16].

(f) Odour emissions arising from the Plant are mitigated through on-site management, coupled with the buffer distance of the Plant from any sensitive receptor. Mr Cudmore recommends the measures that need to be employed to achieve the BPO for all current and future potential odour discharges from the Plant activities.

Southland Regional Water Plan

4.15 An assessment of the relevant objectives and policies contained in the Water Plan has also been undertaken in Chapter 10, Section 10.6 of the AEE. With regard to this assessment, I am of the view that the applications

[13] Objective NH.1 of the Proposed RPS.
[14] Refer to the technical assessments in Appendix M attached to the application.
[15] Objective AQ.1 of the Proposed RPS.
[16] Policy AQ.1 and AQ.5 of the Proposed RPS.

are consistent with the relevant objectives and policies, for the following reasons:

(a) The primary upgrade to the wastewater treatment system that has been completed has achieved a reduction of nitrogen in the waste load of around 10 – 20%[17]. Suitable interim compliance limits have now been proposed to reflect this.

(b) With regard to the other parameters identified in Objective 4:
    (i) Phosphorous is anticipated to be reduced with the overall wastewater treatment upgrade.
    (ii) It is being proposed that Alliance will investigate whether it is necessary and consistent with its BPO obligations to further treat its microbial load in order to contribute to a reduction in the microbial contaminants within the wider catchment at Year 5 of the consent.
    (iii) Clarity may also be improved as a result of the upgrade, but will be more apparent with a catchment wide initiative.

(c) Ms Wise has explained that modifications to the outfall structure to minimise the creation of foams arising from the physical delivery of the discharge to the Makarewa River have been undertaken. I understand that the modifications have already proven to be successful in reducing the creation and presence of foams and further monitoring will continue to confirm this. It would seem to me that Ms Smith's proposed condition 12(a)(ii) is unnecessary.

(d) As explained in the evidence of Dr James, the compliance limits and monitoring that is proposed both pre and post upgrade have been derived taking into account various sources including the Water Plan[18].

(e) The upgrades that have been completed, the ongoing monitoring and compliance with water quality parameters, and the planned upgrades are expected to deliver significant improvements in the quality of the discharges from the Plant to the Makarewa River. In my opinion, this

[17] Objectives 3 and 4, and Policy 4.
[18] Policy 4.

is considered to be consistent with the outcomes intended to be achieved via the relevant objectives and policies of the Water Plan[19].

(f) The discharge to the Makarewa River can be managed so that it is released during appropriate flow conditions, during extreme drought events and prolonged periods of low flow conditions a contingency land option is being proposed to store the treated wastewater until such time as normal flows in the Makarewa River resume[20].

(g) The proposed abstraction from the Oreti River is assessed to be of a scale that will have minor effects on the hydrology, water quality and biological communities and fish species within the Oreti River[21].

(h) The nature of Alliance's take means it is necessary to continue to abstract water during low flow conditions, and to mitigate any adverse effects arising from this, a series of water conservation practices are proposed to be continued at the Plant during such conditions[22].

(i) The current and future discharges to land are not anticipated to have any adverse effects on soil quality and groundwater resources. Zone 2 soils which have been deemed to be less suited for receiving wastewater discharges will be avoided (due to unsuitable soil type and drainage characteristics), and ongoing monitoring of soil and groundwater is proposed[23].

(j) Public access to the rivers will not be prevented as a result of the proposals. However, however due to health and safety reasons, it is not actively promoted in the vicinity of its discharges or water abstraction[24].

(k) In addition to the proposed wastewater treatment upgrade and other initiatives, Alliance is proposing to implement a Habitat Enhancement Management Plan which is to be prepared in consultation with Te Ao

[19] In particular Objectives 2, 3, 4 and Policies 1, 3, 4.
[20] Policy 8.
[21] Objectives 5.
[22] Objective 8.
[23] Objectives 9A and 9C.
[24] Objective 12

Marama. This will look to enhance key areas of ecological importance within the Plant boundary (i.e. riparian planting and oxbow habitat). This will further assist in addressing adverse effects arising from the proposed discharge to water.

(l) The Makarewa River is a highly modified river with significantly reduced natural character values. The proposed discharges to water and to land will maintain the quality of the existing riverine environment, and in time, the recent and future upgrades to the Plant will improve the quality of the discharge and immediate Makarewa River environment[25].

(m) The effects of the proposed abstraction from the Oreti River are minor, and will not adversely affect the river's hydrology, water quality or aquatic ecology which contribute to its overall natural character[26]. I also note that the proposed abstraction does not affect the Water Conservation Order which applies to upper Oreti River, upstream of the proposed abstraction point[27]. This is acknowledged by Ms Smith.

(n) Channel maintenance with respect to the intake structure is minor and will be timed to avoid key fish spawning periods. The intake structure is screened, and an upgrade to this screen is proposed by Year 5 of the consent.

(o) With regard to the discharges to land, monitoring indicates that concentrations of contaminants in soil and groundwater remain relatively consistent and low, meaning there are no adverse effects on the groundwater resource that can be clearly attributed to wastewater irrigation application to land[28].

(p) A sustainable nitrogen loading rate, similar to that yielded from a sheep grazed pasture, is proposed to manage any potential effects on the groundwater resource arising from the application of dewatered BNR solids[29].

[25] Objective 13
[26] Policy 14
[27] Policy 15
[28] Policy 25
[29] Policies 31A and 31C

4.16 Ms Smith has reached the view that the application is inconsistent with Objectives 2, 3 and 4 of the Water Plan, as well as Policies 4 and 9. Given this I undertake a more detailed assessment of these provisions.

4.17 Objective 2 requires the maintenance of water quality:

> *To manage water quality so that there is no reduction in the quality of the water in any surface water body, beyond the zone of reasonable mixing for discharges, below that of the date this Plan become operative (January 2010).*

4.18 Given the extensive monitoring data that is available, the quality of the discharge and its effect on the existing environment is well known and understood. The quality of the discharge has remained relatively constant, and as such there has not been any significant reduction in water quality downstream since 2010 that is primarily due to the effects of the discharge. However, there has been a decreasing trend in the overall water quality in both the upper and lower Makarewa River, Oreti River and the New River Estuary since this time. This reduction is not solely attributable to the discharge from the Plant as it is understood that water quality in the catchment is being predominately affected by other land use practices (i.e. intensive pastoral use). However, as stated above, Alliance is cognisant of its requirement of "doing its part" in the catchment and is therefore committed to improving the quality of its wastewater discharge in the interim, and significantly so in the future. I therefore consider that the proposal is consistent with Objective 2 of the Water Plan.

4.19 Objective 3 seeks:

> *To maintain and enhance the quality of surface water bodies so that the following values are protected where water quality is already suitable for them, and where water quality is currently not suitable, measurable progress is achieved towards making it suitable for them.*
>
> *In surface water bodies classified as mountain, hill, lake-fed, spring-fed, lowland (hard bed), lowland (soft bed) and Mataura 1, Mataura 2, and Mataura 3:*
>
> *(a) bathing, in those sites where bathing is popular;*
>
> *(b) trout where present, otherwise native fish;*
>
> *(c) stock drinking water;*

(d) Ngai Tahu cultural values, including mahinga kai;

(e) Natural character including aesthetics

4.20 The Makarewa River is characteristic of a lowland river body. It is not currently a popular bathing site. There are also physical access difficulties to the lower part of the river where the discharge occurs which make recreational pursuits such as swimming extremely difficult.

4.21 It is understood that the river supports a locally significant brown trout fishery with low-moderate recreational use. The discharge does not appear to be having any adverse effects on fish stocks in the river. The river also supports a moderate-high native fishery.

4.22 Compliance limits with regard to water quality and ecosystem health are also being proposed, these limits require both an immediate and long term improvement in the discharge and receiving water quality.

4.23 Via its submission, TAMI has indicated general support for the proposed mitigation in order to address potential concerns on cultural values.

4.24 The Makarewa River catchment is already highly modified through past and present land use changes including flood protection works. This has significantly reduced the existing natural character values of the river, and the technical assessments have found that the discharge is not adversely affecting ecosystem health. Water clarity downstream of the discharge can be reduced, however because the overall clarity in the river is low this change is not considered to be conspicuous to the point that it has an observable reduction in the aesthetics of the river downstream of the discharge.

4.25 In light of the above, it is my view that the proposed discharge is consistent with Objective 3.

4.26 Objective 4 seeks:

> *To manage the discharge of contaminants and encourage best environmental practice to improve the water quality in surface water bodies classified as hill, lowland (hard bed), lowland (soft bed) and spring fed, and in particular to achieve a minimum of 10 percent improvement in levels of the following water quality parameters over 10 years from the date this Plan became operative (January 2010):*
>
> (a) *Microbiological contaminants*
>
> (b) *Nitrate*
>
> (c) *Phosphorus*
>
> (d) *Clarity*

4.27 It is apparent to me that the ultimate aim of this objective is intended to apply at the catchment level, that is a 10% improvement in the water quality parameters in the water body is achieved by 2020, rather than a specific obligation for every discharge permit to achieve a 10% improvement. Having said that, the current water quality in the catchment is not considered to be acceptable by the Council and this is recognised by Alliance in its proposal.

4.28 As discussed earlier recent upgrades to the wastewater treatment system have been implemented and a comprehensive further upgrade to the wastewater treatment system is proposed. The recent upgrade has delivered a reduction of nitrogen, such that Alliance now has sufficient confidence to offer more stringent interim nitrogen limits. These are reflected in the amended conditions attached as **Appendix B** (see condition 8a and 10(h)) and show an improvement in excess of the 10% promoted by this part of the Plan.

4.29 Moreover and as described in the evidence of Dr James the subsequent and more significant upgrade will achieve a significant further reduction in contaminants discharge stream.

4.30 The proposed conditions also require Alliance to consider whether as part of the upgrade further treatment of its microbial load in the discharge is required. It is likely however that any improvement in this regard will only be apparent in the river in concert with a total catchment reduction. Clarity

may also be improved as part of the comprehensive upgrade, however again without a total catchment improvement this will not likely result in any significant observable improvement.

4.31 As I have already outlined establishing and attaining more stringent water quality parameters and achieving a 10% improvement in the water quality indictors identified above throughout the catchment will require a substantial catchment wide reduction in the quantity of contaminants discharged.

4.32 In my opinion, the Alliance approach to the setting of both interim and longer term water quality limits is consistent with the requirements of Objective 4. Moreover, the proposal works in tandem with the Council's own work which aims to manage changes in the catchment so that water quality is improved consistent with the Objective 4 outcomes.

4.33 Policy 4 relates to surface water bodies outside natural state waters. It seeks to:

> *Manage point source and non point source discharges to meet or exceed the water quality standards referred to in Rule 1 and specified in Appendix G "Water Quality Standards", unless it is consistent with the promotion of the sustainable management of natural and physical resources, as set out in Part 2 of the Resource Management Act 1991, to do so and so avoid levels of contaminants in water and sediments that could harm the health of humans, domestic animals including stock and/or aquatic life.*

4.34 Rule 1 requires that the discharge of any contaminant or water into a surface water body, or into land where it may enter water, is a discretionary activity provided it can comply with the water quality standards for the relevant water body listed in the Plan. Failure to comply with such standards results in a non complying activity status. There is however a specific exemption for the discharge of treated wastewater from the Plant to the Makarewa River. The Plan sets out that this exemption is in place, "*because the nature of the receiving waters at that location means that even a discharge of wastewater that has been treated to a standard that substantially reduces the biological content of the wastewater cannot meet*

some of the water quality standards at present[30]*".* Notwithstanding this exemption, Alliance has sought to align its proposed discharge quality and receiving water limits with the Water Plan where it is practicable to do so. This is discussed in the evidence of Dr James.

4.35 Ms Smith concludes that because some of the standards in Appendix G are not achieved, the proposed discharge is inconsistent with Policy 4. I do not agree that the assessment against this policy is as rudimentary as that. Policy 4 recognises that in some circumstances it may be consistent with the sustainable management purpose of the Act to allow a reduction or non-compliance with the water quality standards in Appendix G, provided it does not cause harm to human health, stock or aquatic life.

4.36 The Plan acknowledges that despite the level of treatment of the wastewater discharge the receiving water quality within the Makarewa River cannot achieve some of the water quality standards listed in Appendix G. Visual clarity in the river, even if the discharge was completely transparent, would not be able to achieve the 1.3m standard.

4.37 The rationale behind the proposed limit setting is set out in the evidence of Dr James and Dr Fitzpatrick. In my view enabling the Plant to operate within a scientifically and environmentally robust suite of site specific compliance limits, which requires an improvement in water quality in the interim with a step change in improvement at year 15, is consistent with achieving the sustainable management purpose of the Act. The proposed limits have been developed taking into account the sensitivity of the receiving water environment, the effects of the current discharge and the current and likely future national and regional requirements. They also recognise that the Plant is a significant infrastructure asset for the region providing significant economic and social benefits for the community, and enables the company to financially commit to the upgrades without jeopardising the current economic viability of the Plant.

[30] Quality Rules, Page 4, Regional Water Plan for Southland.

4.38 I also note that Ms Smith in her conclusion regarding Part 2 matters finds that the application(s) is consistent with the purpose and principles of the Act[31].

4.39 Policy 9 of the Water Plan relates to the determination of the mixing zone size. Mr Montgomerie explains the detailed assessment that was undertaken to determine the extent of the mixing zone. It is noted that this is influenced by the tidal nature of the river in this location. The assessment concludes that the discharge will be fully mixed by approximately 200m downstream. As outlined in the evidence of Dr James, there are significant physical constraints to enable monitoring to be undertaken at this site and therefore the measuring point is 350m downstream.

4.40 Dr Ryder expresses some concern as the size of the mixing zone and the potential toxicity effects within that area. Dr James does not agree that there is evidence that the discharge is having any adverse effect within the mixing zone due to the overall biological health and functioning of the river and fish surveys that have been undertaken, and Dr Fitzpatrick's opinion is that ammonia toxicity in the mixing zone is not an issue.

Southland Regional Air Plan and Proposed Regional Air Plan

4.41 As assessed in section 10.6 of the AEE, the discharge to air consent that is being sought is considered to be consistent with the objectives and policies in both the Proposed and Operative Air Plans for the following reasons.

(a) The proposed discharges to air from the coal fired boiler operations at the Plant comply with all relevant national standards and guidelines for air quality beyond the site boundary and at locations of existing sensitive receptors[32].

(b) As explained in the evidence of Mr Cudmore, ambient monitoring of particulate emissions (both PM_{10} and $PM_{2.5}$) is proposed. This will provide a greater understanding of the effects of the boiler discharges on ambient air quality[33].

[31] Page 66, Section 42A Report.
[32] Objective 4.2.1
[33] Policy 4.3.5

(c) Alliance is proposing a sinking lid approach to reducing its particulate emissions which is consistent with the policy intent to maintain and improve ambient air quality in the region. The potential effects arising from the discharge on the environment and human health are further mitigated by the stack height, maintenance of coal quality, operational measures and the buffer distance between the boilers and any adjacent sensitive land uses. An ongoing obligation is also proposed to undertake periodic technology reviews so the consent holder and the consent authority are well informed of the BPO in the future which will guide further management responses[34].

(d) Odours from the Plant and its activities are successfully controlled with appropriate operational procedures and technology, coupled with the buffer distance of the Plant from any adjacent sensitive land uses. These factors assist in avoiding, or mitigating any objective or offensive adverse effects arising from potential odour emissions[35].

(e) It is also anticipated that the wastewater treatment upgrade, including the separation of waste streams and further treatment, will further assist in mitigating potential odour effects[36].

4.42 With regard to Ms Smith's assessment of the proposed discharges against the provisions of the Air Plan, I note that she concludes that the discharge will be inconsistent with Objective 5.2.1 and Policy 5.3.1. These provisions seek to avoid, remedy or mitigate adverse effects from discharges on the environment, and to protect the environment from adverse effects arising from discharges. I am not clear how she has arrived at this conclusion, particularly when her assessment of the higher order operative RPS concludes that:

> *"It is proposed that a reduction of PM_{10} emissions from the CFBs will occur within a set time period. The application is therefore considered to be consistent with Objective 12.1 and Policy 12.3[37]"*

[34] Objective 5.2.1
[35] Objective 7.2.2
[36] Policy 7.3.1
[37] Page 43 of the Section 42A Report.

4.43 These provisions similarly seek to “protect the Region’s air quality, and to enhance air quality in areas where it has been degraded” and “to consider health concerns in all matters relating to air quality management”.

Southland Regional Effluent Land Application Plan

4.44 The discharges to land are considered to be consistent with the objectives and policies in the Regional Effluent Land Application Plan for the following reasons:

(a) The effects of the wastewater irrigation application to land are well understood, as monitoring of the soil and groundwater resources has been undertaken since 2001. The results of this monitoring are reported to the Council annually. The monitoring confirms that concentrations in contaminants in soil and groundwater resources remain relatively consistent and at low levels. The monitoring also indicates that Zone 1 soils remain in good condition. It is proposed to avoid any application of the discharge to soils that are classified as Zone 2 within the Alliance farmland.

(b) The upgraded wastewater treatment facility requires the discharge of dewatered solids to land and to an onsite monofill as a contingency option. Prior to application to land, the material will be dewatered to mitigate against water logging, ponding and nutrient runoff. The leaching of nitrogen is the key risk with regard to this land application, as this could give rise to adverse effects on groundwater and surface water resources if not appropriately managed. A proposed nitrogen loading rate of 250 N/ha/yr or a plant available nitrogen (PAN) of 140kg N/ha/yr has been derived as being appropriate. This would likely result in a nitrogen leaching rate that is equivalent to a sheep grazed pasture.

(c) Potential amenity effects arising from the discharges to land (i.e odour effects) are managed through operational controls of the land application (e.g the restriction on storage times). Other measures are detailed in the draft BNR Management Plan attached to the evidence of Mr Khan.

Southland Regional Coastal Plan

4.45 The Coastal Plan recognises that the New River Estuary has values in that it provides nationally important habitat for bird species, as well as a nationally important nursery area for numerous fish and invertebrate species, including galaxiids and toheroa. Objectives and policies of the Coastal Plan seek to maintain and enhance such values of the New River Estuary and an issue that is identified as affecting the estuary is poor water quality. As set out above, it is acknowledged that Alliance's wastewater discharge to the Makarewa River is a contributor to the nitrogen and phosphorous loading within the estuary. The proposed upgrade is likely to significantly improve the quality of the discharge and immediate receiving river environment. However in order to achieve an observable improvement in the quality of the New River Estuary, a catchment wide approach to water quality improvement is necessary.

Proposed Water and Land Plan

4.46 As set out above the Proposed Water and Land Plan was notified in June 2016. This Plan contains objectives, policies and rules relating to the management of water and land resources in Southland. Submissions on the Proposed Plan are currently open and close on 1 August 2016. Given that submissions, hearings and decisions on the Proposed Plan are still some time away, it is considered that greater weight in regard to the evaluation of the applications should be placed on the operative regional plans. I note that Ms Smith agrees with this assessment. Notwithstanding this, an assessment of the proposal against the rules of the Proposed Plan has been undertaken.

4.47 The proposed discharges to water and land, and the abstraction of water trigger the following rules in the Proposed Plan:

(a) Discharge to water – Rule 6 non complying activity;

(b) Discharges to land – Rule 34(b) non complying activity;

(c) Water abstraction from the Oreti River – Rule 49(c) discretionary activity;

(d) Channel maintenance within the Oreti River to maintain the intake structure – Rules 73(b) restricted discretionary, and Rule 75 permitted activity.

4.48 Although the activities attract a non-complying activity status under the Proposed Plan, I note that pursuant to section 88(A) of the RMA, the applications are still to be assessed as a discretionary activity. Ms Smith agrees with this in her assessment.

4.49 As noted I have undertaken an assessment of the objectives and policies of the Proposed Plan in **Appendix C**. Some of the key points I make in my assessment are:

(a) The Plant is a significant physical resource and is dependent upon an ability to access water for its operations and activities, and an ability to discharge treated wastewater to both land and water;

(b) Alliance has recognised the relationship that iwi has with the land, water and air and has engaged with iwi in order to understand the potential or actual effects on cultural values. Alliance has worked with TAMI to develop an appropriate response in terms of mitigation, including adherence to water quality limits, a commitment to upgrade its wastewater treatment systems, and the preparation and implementation of a Habitat Enhancement Management Plan. This is reflected in the generally supporting submission made by TAMI.

(c) The assessment with regard to the discharge to water has observed that the lower Makarewa River is characteristic of a lowland river environment, and while there are elevated nutrient concentrations and decreased clarity both upstream and downstream of the discharge, the river still exhibits reasonable ecological health. This indicates that species are tolerant of the nature of the existing environment, including the effects of the existing discharge from the Plant. It is acknowledged that the current discharge cannot comply with the water quality limits that are set out in Appendix E of the Proposed Plan, and potentially the future catchment limits that may be developed. Given this, it is appropriate that the current quality of the discharge does not cause any further deterioration to the water quality of the Makarewa River, and as such Alliance is proposing to adhere to more stringent limits relating to ammonia now and in the longer term.

(d) The proposed water abstraction will only have minor effects on the hydrology, quality, ecology and overall natural character of the Oreti River downstream of the proposed abstraction site.

(e) The discharges to land do not have any adverse effects on groundwater quality and the application is to be managed so that the integrity of the soil resource is maintained (i.e. application depth and rate, avoidance of unsuitable soils).

(f) The current Plant upgrades that have occurred resulting in a reduction in nitrogen in the discharge, and the proposed comprehensive upgrades will ensure that an improvement in water quality within the Makarewa River is achieved, and pre-empts and would fulfil the obligations inherent in the catchment review process for improving water quality in the long term.

(g) A full suite of alternatives, including the option of discharging wastewater to land in its entirety has been considered. This has been discarded however as there are difficulties in accessing sufficient land in order to suitably mitigate the effects of land disposal, and the capital costs of doing so are prohibitive.

(h) Minor channel maintenance work and clearance is required to keep the intake structure free from debris. Measures to mitigate any potential effects arising from this (i.e. the timing of scheduled works to avoid key fish spawning and migration seasons) are proposed.

(i) An upgrade to a smaller fish screen mesh size for the intake structure is proposed to occur within five years to further mitigate any potential adverse effects on fish.

(j) In relation to Policy 40 and determining the term of resource consents I consider a 35 year consent term for the consents being sought is appropriate for the reasons I have set out above in paragraphs 2.30 to 2.33.

4.50 Ms Smith assesses the proposed discharge of wastewater as being inconsistent with the objectives and policies relating to water quality in the Proposed Plan. The reasons for this relate to her view that the proposed discharge will only maintain water quality, and there is no certainty that any improvement will be achieved despite the proposed upgrade to the wastewater treatment system.

4.51 As indicated earlier, I am perplexed by this. The future limits set out within proposed conditions 15 and 16 are clearly directed at yielding a significant enhancement in water quality.

4.52 To the extent that Alliance's significant improvements in discharge water quality will not of themselves result in a significant improvement in the New River Estuary, this cannot be attributed to Alliance's approach to these consents. As is clear, catchment-wide action is required, and the evidence suggests that until other discharges in the catchment proportionally reduce their nutrient contributions meaningful gains at the catchment scale will not be realised. In my opinion what Alliance is doing via the proposed consent conditions is providing assurance to Environment Southland that Alliance will play its part in achieving those catchment-wide gains

Relevant Other Matters

4.53 An assessment of relevant other matters including:

(a) Southland District Plan;

(b) Invercargill Proposed and Operative District Plans;

(c) ANZECC Guidelines;

(d) AAQG and other Air Quality Guidelines;

(e) Proposed Conservation Management Strategy for Southland; and

(f) Ngai Tahu ki Murihiku Natural Resources and Environmental

has been undertaken in Chapter 10, section 10.8 of the AEE. I refer the Panel to that assessment.

Sections 105 and 107

4.54 Section 105 of the RMA states if an application is for a discharge permit the consent authority must, in addition to the matters in section 104(1), have regard to the following:

> *(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.*

4.55 These matters including the reasons for Alliance's proposed choice of discharge regime are addressed in detail in Chapters 3, 4, 8 and 10 of the AEE. It is concluded that the proposed discharges to air, water and land have accounted for the three matters inherent to section 105.

4.56 Section 107 of the RMA sets minimum standards for discharges to water, which prevents consent being granted if, after reasonable mixing, the discharge gives rise to any of the following*:*

> *(c) The production of any conspicuous oil or grease films, scums or foams, or floatable or suspended materials:*
>
> *(d) Any conspicuous change in the colour or visual clarity:*
>
> *(e) Any emission of objectionable odour:*
>
> *(f) The rendering of fresh water unsuitable for consumption by farm animals:*
>
> *(g) Any significant adverse effects on aquatic life.*
>
> *...*

4.57 As outlined in Section 10.10 of the AEE, none of the outcomes above are expected to occur as a result of the proposed wastewater discharge to the Makarewa River. Foams that were observed downstream of the discharge have been minimised with the changes that have been made to the outfall structure. As such, there is no impediment in my view under section 107 for the consents not to be granted.

5. SUMMARY OF ASSESSMENT OF ACTUAL AND POTENTIAL EFFECTS ON THE ENVIRONMENT

5.1 Chapter 7 of the AEE provides a detailed assessment of the actual and potential effects of the applications being sought by Alliance. Table 16 in Chapter 8 of the AEE provides an overview of these effects. In my opinion the AEE provides a comprehensive and complete identification and assessment of the actual and potential effects of the applications on the environment. I therefore do not intend to repeat that assessment in this evidence, but will highlight some of the key findings. In making my assessment, I also rely on the technical assessments and evidence of other witnesses.

Economic Effects

5.2 The direct economic benefits arising from the operation of the Plant are explained in the report and the evidence of Mr Copeland.

5.3 Mr Hailes explains the Plant provides Alliance with its only processing capacity for lambs and sheep within the Southland region and any reduction in the Plant's capacity to process lambs and sheep would see this livestock processed outside the region. The latest estimate for the Plant's replacement cost is $240 million and much of this value is sunk investment, meaning that it could not be recovered if the Plant was forced to downsize or close.

5.4 Analyses undertaken by Alliance have confirmed that there are significant advantages in retaining processing capacity at the Plant relative to other new sites and/or the expansion of other existing Plants. Consents renewals will therefore enable Alliance and its supplier shareholders to continue to benefit from the economic advantages of the Plant. Closure or downsizing of the Plant due to consents not being renewed, or with an untenably short consent term would likely result in efficiency losses, higher costs and reduced returns for Alliance's farmer shareholders. In my opinion, the economic and social benefits that accrue from the ongoing operation of the Plant are significant to the Southland region.

Effects on Water Quality, Ecology and Recreational Values within the Makarewa River, Oreti River and New River Estuary

5.5 As explained in the AEE, work associated with the assessment of the current and possible future discharges on the Makarewa River, Oreti River and New River Estuary began in 2012. Alliance also undertakes regular compliance monitoring, and additional field monitoring has been undertaken as part of this assessment. It is apparent to me that there is a good understanding of the existing water quality both upstream and downstream of the current discharge of treated wastewater from the Plant.

5.6 As explained in the evidence of Mr Montgomerie the lower Makarewa River (below Wallacetown) has been modified by historical river drainage and flood protection works. Makarewa River water and sediment quality in the vicinity of the Plant (immediately upstream and downstream of the Plant) is characterised by high nutrient concentrations, high faecal indicator bacteria counts, low visual clarity, high ammonia concentrations, generally moderate but occasionally low summer dissolved oxygen concentrations, and pH that is suitable for supporting healthy biological communities.

5.7 The monitoring and assessment of the receiving river environment has not identified any measurable adverse toxicity effects that are directly attributable to the discharge. However, as it has been explained earlier in this evidence it has been determined that the current discharge needs to be improved to be able to meet a site-specific in-river ammonia target and enable the achievement of the bottom line value contained in the Freshwater NPS within the wider catchment. These assessments indicate that a 75% reduction (from 2012-13 season concentrations) in discharge ammonia concentration is the appropriate target.

5.8 The clarity of the lower Makarewa River is low overall due to a range of catchment scale influences. The lower Makarewa River in the vicinity of the discharge supports limited contact recreation and therefore the effect of the discharge on river clarity is not assessed as significant.

5.9 Foams occur at times in the Makarewa River below the discharge, however they have also been observed upstream of the Plant. It is likely that an historic contributing factor to the generation of foams was the physical

delivery of the discharge to the Makarewa River. Ms Wise explains that modifications to the outfall structures have been undertaken which have been successful in mitigating the generation of conspicuous foam from the outfall delivery.

5.10 Dr James also reports that the current discharge can elevate faecal bacteria concentrations in the lower Makarewa River on occasions and in some years but in other years appears to dilute the contamination from microbial sources.

5.11 Overall the assessments determine that the discharge is not having a significant adverse effect on water quality downstream of the Plant, when compared to upstream results. In terms of ecology, I understand from the evidence of Mr Montgomerie and Dr James, that it is the habitat being the soft sediment and tidal nature of the lower Makarewa River which is the limiting factor for the presence of sensitive invertebrate species (e.g. mayflies), rather than the lack of mayflies being caused by the discharge.

Effects of the Water Abstraction – Oreti River

5.12 The ongoing abstraction effects on the hydrology of the Oreti River, water quality, and aquatic habitat have been assessed and are considered to be minor by Mr Montgomerie. This conclusion is generally supported by Dr Ryder. The only identified effect on the river due to this abstraction was a likely increase in the number of days that flows were below the natural 7DMALF. This is however considered to have only a minor effect on the river's hydrology and other features including water quality and ecology. Alliance is also proposing to upgrade the current fish screen system on the intake. This was proposed to occur within five years of the consent being issued. Dr Ryder has expressed some concern around this timing and recommends that the upgrade takes place within two years of the consent being issued. Considering that there is currently no evidence that the intake structure is creating a hazard for fish entrainment, I do not agree that it is necessary to proceed with this in such a short time frame, and I note that this is Mr Montgomerie's opinion also. Requiring this upgrade to instead take place at year 5 of the consent also suitably recognises the sizeable investment that is required to upgrade the screen.

Effects of the Wastewater Irrigation

5.13 The effects of the wastewater irrigation application to land are also well understood as monitoring of the soil and groundwater resources has been undertaken by Alliance since 2001. The latest annual monitoring report indicates that there have been no significant adverse effects on the environment that can be clearly attributed to wastewater irrigation application to land. Over the monitoring period concentrations of contaminants in soil and groundwater resources remain relatively consistent and low. I understand from the technical evidence that the experts are in general agreement as to the effects arising from the wastewater irrigation discharge.

Effects on Groundwater from Wastewater Ponds

5.14 The wastewater treatment ponds were established around 1968, and it is understood that no compacted clay or synthetic liner was installed. Given this, there could be the potential for leakage of wastewater to soil and groundwater resources from the ponds. An investigation to confirm this has been completed.

5.15 The assessment finds that the wastewater discharge from the ponds is primarily directed toward the Makarewa River and is not having any significant impacts on groundwater to the south of the ponds. The results indicate that the ponds therefore have a reasonable barrier which is containing contaminants successfully. If there is any leakage from the ponds to the river, then this is being captured by the monitoring that is occurring in-stream and will be managed by the compliance limits that are proposed.

Effects on Soils and Groundwater from BNR Solids and Monofill Disposal

5.16 As has been discussed a comprehensive upgrade to the existing wastewater treatment facility is proposed. The new treatment facility would necessitate the disposal of dewatered BNR solids to land, and to an on-site monofill as a contingency option. Prior to land disposal the solids will be dewatered to mitigate against water logging, ponding and nutrient runoff. The leaching of nitrogen is a key concern with respect to the application of BNR solids to land as this could give rise to adverse effects on the

groundwater and surface water resources, and will require application rates consistent with maintaining sustainable biosolids nitrogen loading rate.

5.17 A proposed biosolids nitrogen loading rate of 250 kg N/ha/yr or a plant available nitrogen rate of 140 kg N/ha/yr has been derived from the technical assessments as being appropriate. This would likely result in a nitrogen leaching rate of approximately 13kg N/ha/yr, which is equivalent to the nitrogen leaching rate from sheep grazed pastures. The technical evidence attached to the section 42A report has not raised any significant concerns with this proposed discharge.

Effects on Air Quality from the Coal Fired Boilers

5.18 The coal fired boilers emit particulates ($PM_{10,}$ $PM_{2.5}$), nitrogen dioxide/oxide, sulphur dioxide, dioxins and heavy metals into the air. Modelling and monitoring of the discharge emissions from the coal fired boilers has been undertaken, and the results assessed against relevant national and international standards and guidelines for air quality and human health. Mr Cudmore has concluded that all cumulative ambient contaminant concentrations achieve compliance with all relevant standards and guidelines for air quality beyond the property boundary and at locations where people are likely to be exposed.

5.19 Mr Cudmore concludes that for all contaminants, with the exception of particulates, achieving compliance with the standards and guidelines indicates that the effects on air quality and human health are minor or less.

5.20 Mr Cudmore also concludes that particulate discharges comply with the national guidelines for ambient particulate concentrations, however Mr Cudmore is of the view that this does not of itself ensure only minor, or less than minor effects on human health. I understand that this is because particulate emissions, particularly for $PM_{2.5}$ emissions do not have an established threshold concentration below which there are only minor or no observable adverse effects on human health (ie. no established 'safe' limit).

5.21 Mr Cudmore therefore recommends that Alliance reduces boiler particulate emissions to achieve a maximum PM_{10} limit of 250mg/Nm^3 (corrected to 12 vol.% CO_2) in the discharge within five years. This would ensure that the

best performance of the control systems for managing particulate emissions is achieved, and assists in reducing potential health effects arising from exposure to particulate emissions. This is coupled with a requirement to review whether the BPO for the control of particulate emissions is being achieved at Year 10, and five year intervals thereafter. I consider this to be appropriate given that from the evidence of Mr Cudmore. I understand the key particulate in terms of potential health effects is $PM_{2.5,}$ and that current technology such as bag houses or ESPs may not be appropriate for managing this particulate. The proposed condition (17) in this regard ensures that Alliance will review monitoring data, technological enhancement opportunities, and research on how $PM_{2.5}$ might be reduced if this proves a necessary obligation.

Odour Effects

5.22 As explained by Mr Cudmore a number of on-site processes, as well as the wastewater treatment system itself can cause, or have the potential to generate odour discharges. Overall, Mr Cudmore concludes that with the continuation of appropriate management practices and technology employed by Alliance with respect to the management of potential on-site odours, coupled with the buffer distance of the Plant from any sensitive receptor, the adverse effects arising from odour emissions will be minor. The upgraded wastewater system is anticipated to also reduce odour emissions from that source, and the application of biosolids to land will be managed to also take into account potential odour effects.

Cultural Effects

5.23 As outlined earlier in this evidence and as explained in the evidence of Mr Dons, Alliance has been engaging with TAMI to seek the iwi perspective on the consents that are being sought. This engagement has been premised on the principles of the Treaty of Waitangi, in particular the principles of good faith and cooperation. As part of this TAMI were asked to prepare a Cultural Values Report. This was attached to the AEE as Appendix C.

5.24 The Cultural Values Report and consultation has identified that there are core cultural values that need to be recognised and appropriately managed as part of the consenting and mitigation developed for the Plant. These core values include kaitiakitanga, mahinga kai, ki uta ki tai (linkages to the wider

catchment and processes) and whanaungatanga (health and wellbeing of Maori people). These matters have all been taken into consideration as part of the wider environmental investigations and assessment undertaken (i.e. water quality, ecosystem health, economic). In addition, Alliance recognises that a holistic approach to the management of environmental effects is necessary and advocated by Maori. In terms of a future stewardship role, it is envisaged that the technical working group required by condition 28 would include membership from Te Ao Marama.

6. METHODS TO MANAGE EFFECTS ON THE ENVIRONMENT

6.1 The AEE identifies a range of positive and potential or actual adverse effects that could arise as a result of the ongoing operation, use, maintenance and upgrading of the Plant. It is evident to me that Alliance is committed to ensuring any adverse effects arising from its Plant's operations and activities are appropriately managed and has been guided by the recommendations of its technical advisors as to the necessary mitigation. Where appropriate these measures have been secured by way of a proposed condition of consent.

6.2 Appendix V of the AEE contained a number of proposed draft conditions attaching to each consent that is being sought by Alliance. Subsequent to the lodgement of the application, the Council's further information request and discussions with technical advisors on behalf of the Council, Alliance and its experts have reviewed the proposed discharge to air, water and land conditions and made some further refinements. These were submitted to the Council in June 2016. Ms Smith has reviewed these conditions and suggested some amendments. I have considered these changes and attached a revised set of conditions as **Appendix B**. I set out below some comments regarding Ms Smith's recommendations and summarise my opinions as to how the conditions should be drafted.

Discharge to Water

6.3 The key features of the conditions relating to the wastewater discharge to water consent is the use of compliance limits both pre and post upgrade to ensure water quality in the Makarewa River does not deteriorate from its current state, and is improved in the interim and in the future consistent with

the obligations inherent in the operative and proposed regional and national policy framework. In my view there is sufficient understanding of the effects of the current discharge to ensure that these limits have been set in a scientifically robust way to ensure water quality, ecology and other values in the Makarewa River system are not compromised as a direct result of the discharge.

6.4 The conditions also require a number of reviews or check points throughout to ensure that Alliance is cognisant of the wider catchment improvements and water quality standards that might be introduced as part of this. Conditions also require that all monitoring results, and any uncovering of a situation where a defined threshold has been crossed are widely shared (i.e. with the Council and the Technical Working Party (TWP)) so that the ultimate response can be determined in a collective way if appropriate. Ensuring Alliance is achieving its BPO obligations throughout the consent term is also closely tied to review conditions such that if changes in the catchment emerge whereby Alliance is a clear outlier in terms of effects, then the terms and conditions of the consents in question can be reviewed.

6.5 Some of the specific matters dealt with by the proposed conditions are set out below:

(a) Condition 3 of the discharge of wastewater to water consent requires the preparation of an Environment Monitoring Plan (EMP). This plan is to set out the discharge and water quality monitoring requirements and specify details such as the monitoring sites, and to detail the specifics with regard to the monitoring requirements for the biological and fish health survey that is also proposed. The EMP will be reviewed throughout the life of the consent, and in particular after the preparation of the Wastewater Treatment Upgrade Plan is prepared and submitted. The purpose of the review will be to determine whether the monitoring methodologies remain valid and purposeful.

(b) Conditions 6 and 7 require Alliance to undertake aquatic biological monitoring and a fish health survey. The ultimate purpose of these conditions is to provide a baseline for which comparative analysis can be made post upgrade of the wastewater treatment plant. This will

inform the extent of beneficial effect the upgrade will have on these indicators in the Makarewa River.

(c) Conditions 8, 8a and 10 relate to the pre wastewater treatment plant upgrade or interim water quality compliance limits in both the discharge stream and Makarewa River. As explained in the evidence of Ms Wise and Dr James, these limits have been derived following a review of the current impact of the discharge, the existing environment, and the results of the recent primary treatment upgrades that have been implemented at the Plant. The proposed interim limits include:

- wastewater concentration limits based on the 95th %ile of the last five years' results.
- newly introduced in-river ammonia limit to protect against acute habitat effects, and additional longer term limits that reduce the current limits by 30%.
- a newly introduced annual N load limit (representing a 15% reduction on 12/13 base year to be achieved after two years) within the discharge stream.

These are reasonably significant reductions and are consistent with various policy directives which seek to enhance water quality where there is existing water quality degradation.

(d) Ms Smith recommends amending condition 8(b) so that if the limits specified in condition 8(a) are exceeded on only one occasion, rather than on two consecutive occasions, then this triggers the review and reporting obligation inherent in condition 25. In my view allowing for two exceedances before triggering a thorough investigation as to why is appropriate. The quality of the discharge is monitored on a frequent basis, and if two consecutive samples are found as causing an exceedance then it is a more reliable indicator that there might be something amiss, rather than potentially an anomaly in the data. The resources involved in undertaking the review requirements of condition 25 are reasonably significant and in my view there needs to be genuine reason before this process is triggered.

(e) Dr Ryder recommends that the soluble BOD concentration in the receiving water shall not exceed 2g/m^3. This has been reviewed by Dr James and a condition that sets in place a 90%ile limit not exceeding 2g/m^3 is now proposed. .

(f) Condition 12 requires the preparation of the Wastewater Treatment Upgrade Plan to be prepared and submitted to the Council by Year 5 of the consent. This plan will specify the technology that will be used to upgrade the plant, include the detailed design and methodology of the progressive upgrade and the monitoring and reporting obligations associated with the upgrades. The conditions also require Alliance to report to the Council its progress on upgrading the treatment system. For the reasons set out in Ms Wise and Mr Khan's evidence in particular, Alliance will not be able to prepare this plan within 2 years of the consent being issued.

(g) By Year 15 of the consent, conditions 14 and 15 require that the upgrade is completed and is functioning effectively such that compliance with revised discharge and in river water quality limits are being achieved. These limits are representative of what is expected to result in a significant reduction in nitrogen and ammonia in particular.

(h) Condition 17 requires that once the wastewater treatment upgrade has been commissioned and fully operative for 12 months, a review of the post upgrade limits for Total Nitrogen and Total Phosphorous is undertaken by an appropriately qualified expert. The purpose of this review shall be to determine whether the limits are appropriate for maintaining and enhancing water quality in the Makarewa River, and shall include an evaluation of the monitoring results and a review of the relevant guidelines or standards that may apply for such parameters. In my view this would specifically require consideration of whether the limits are appropriate in the context of the FMU catchment limits that would be expected to be in place by this time. The results of this review are to be submitted to the Council, and if this review recommends amendments to the limits in the conditions then it is able to initiate a formal review of the consent in accordance

with condition 34, and potentially look to revise the post upgrade limits if necessary as a result of this review. Ms Smith recommends that new limits for Ammonia and Dissolved Reactive Phosphorus are also considered and imposed if required as part of this review. I understand that these contaminants are already captured by measuring Total Nitrogen and Total Phosphorous. Therefore the reduction in Total Nitrogen and Total Phosphorous in the discharge load, will result in a corresponding reduction in Ammonia and Dissolved Reactive Phosphorous.

(i) Conditions 18 and 21 relating to Alliance's obligation to ensure its discharges are achieving the BPO in terms of its impact on water quality, ecology and other values have been recommended for deletion by Ms Smith. Ms Smith instead recommends that a review is undertaken six months post finalisation of the Oreti River catchment limits (her proposed condition 20). The outcome of this review would be to provide a report detailing the options considered for the treatment and discharge of wastewater in order to meet the catchment limits. Ms Smith recommends that the outcome of any such review be implemented within four years of the reporting. In my assessment, Ms Smith's approach in this respect has some fundamental difficulties. The conditions, as she proposes them would require the consent holder to achieve catchment limits, irrespective of what else might be occurring to influence water quality in the catchment. If water quality in the catchment remained above the set limits for any reason, including reasons beyond the control of the consent holder, the consent holder would still be held to account in terms of compliance. In effect, the consent holder becomes the underwriter for achieving water quality limits within the entire catchment, even though its influence is limited to just one part of the catchment. This is not a realistic approach. Nor is it realistic for substantial additional technological upgrades to be planned, designed, implemented and commissioned within a four year timeframe, particularly when any target shortfalls would not become evident until the reporting envisaged by Ms Smiths Condition 20 had been completed. I accept of course that if the monitoring indicates that Alliance has become an obvious outlier in terms of catchment

water quality, then this may be cause for a Council initiated review of the consent.

(j) Condition 22 relates to the Habitat Enhancement Plan which will be prepared in consultation with TAMI as I have descried earlier in this evidence. The purpose of this plan is to further mitigate or offset effects of the discharge by improving or enhancing habitat elsewhere on the site.

(k) Conditions 23 to 26 provide for Alliance's reporting obligations throughout the consent duration. Condition 25 specifically requires that if an exceedance of any of the limits specified in the consent is detected then this shall be notified to the Council, along with the identification of the likely cause, the effects, the management response undertaken and whether any further remedial work might be required to address it. Condition 26 requires the consent holder to prepare an annual report detailing the results of the monitoring undertaken that year and to undertake an assessment of in river ammonia monitoring results against the post upgrade limits, in order to track progress of the progressive Plant upgrades and anticipated improvements in ammonia reduction. It also requires a calculation of the annual discharged loads of ammonia nitrogen, total oxidised nitrogen, total nitrogen and total phosphorous and a comparative analysis of these loads against preceding seasons.

(l) Conditions 27 to 30 provide for the facilitation of the continuation of the Technical Working Party (TWP), which is discussed in the evidence of Mr Dons. Invitations to key stakeholders including Fish and Game, DoC, Te Ao Marama, Public Health South, Councils and the Wallacetown Community representative will be extended to form part of the TWP and regular meetings will be held to inform the group of monitoring results, any issues arising and progress with regard to the wastewater upgrade system.

(m) Conditions 31 to 35 relate to Council initiated review opportunities of the conditions. These are built into a number of the conditions, enabling the Council to initiate a formal review of the conditions in

response to new information and/or to ensure that Alliance is adhering to its BPO obligations.

Discharges to Land – Irrigation

6.6 Given the good understanding of the existing activity and receiving environment, it is my view that the conditions proposed are sufficiently robust in ensuring any adverse effects arising from this activity are or can be appropriately managed. Unlike the existing consent parameters however Alliance is proposing to avoid all Zone 2 soils[38], and is also proposing a compliance limit with regard to groundwater monitoring which if exceeded requires Alliance to notify the Council and to undertake an investigation into the likely cause and effect of the exceedance, as well as a requirement to undertake further mitigation or remedial work if an effect is confirmed and that is the necessary step[39].

Discharges to Land – Dewatered Solids

6.7 The proposed discharge of BNR solids will commence once the wastewater treatment upgrade has been implemented. Proposed conditions set out a requirement to prepare a BNR Solids Management Plan. A draft of this plan has been prepared and is attached to the evidence of Mr Khan. This plan will provide the operational details with regard to the likely generation and volume of dewatered solids to be applied to land, and detail the managerial procedures and physical methods that will be implemented to avoid, remedy or mitigate any adverse effect from this discharge.

6.8 Conditions 5 – 9 require specific operational requirements to be complied with, including adherence to the proposed nitrogen loading rate and physical constraints such as required setbacks from waterways and property boundaries.

6.9 Conditions 10 to 12 relate to the monofill that will be used as a contingency disposal area during certain circumstances. There are also management obligations to be adhered to and monitored with regard to the use of monofill cells.

[38] Condition 2a.
[39] Condition 9.

6.10 Similar to the irrigation consent conditions there is an obligation to undertake extensive soil and groundwater monitoring. As well as trigger values with regard to groundwater monitoring and reporting requirements as part of the application of dewatered solids to land.

Discharge to Air

6.11 With regards to SO_2 Mr Cudmore considers the level of effect to be sufficiently minor and of negligible environmental concern. He opines that the proposed mitigation measures are appropriate given the continued use of the low sulphur lignite coal for firing the CFBs. These measures include the weekly sampling of supplied coal and analysis for sulphur content. This will enable the demonstration of compliance with the proposed maximum coal sulphur limit. In Mr Cudmore's assessment meeting this limit will ensure the ambient impacts of SO_2 remain within the envelope presented in application and therefore ensure a very minor potential for any adverse health effects.

6.12 I note that the section 42A writer and Mr Iseli indicate that the potential SO_2 effects justify continuous in-stack monitoring of SO_2 emissions. Mr Cudmore disagrees that this is necessary on the basis that the level of SO_2 impact is relatively low and any change in coal sulphur over time would be detected by the weekly coal sulphur monitoring that is proposed. I note for completeness that the most exposed adjacent property is zoned rural and the likelihood of additional dwellings being located on that land, closer to the plant is extremely low.

6.13 Key factors in mitigating the effects of particulate discharges from the Plant include the stack height, coal quality and limits on PM_{10}. These requirements are all reflected in the proposed conditions. Condition 12(b) requires that no later than Year 5 of the consent a reduction in PM_{10} emissions from the Plant shall be achieved. I consider it reasonable to allow a delay in committing to this reduction on the basis of Mr Cudmore's confirmation that the current national and regional standards for air quality are being met, there are no sensitive receptors immediately adjacent to the Plant which are currently being directly affected and it will enable Alliance sufficient time to investigate the most appropriate operational requirements,

and/or technological upgrades and to secure capital for further upgrading works.

6.14 The proposed conditions also move away from in-stack monitoring in favour of ambient monitoring. The reasons for this have been explained by Mr Cudmore in his evidence. The proposed conditions require that particulate emissions (both PM_{10} and $PM_{2.5}$) are monitored continuously throughout the year and threshold limits for PM_{10} are required to be complied with. If any exceedance of the ambient monitoring thresholds is detected this requires an investigation into likely cause and effect including a requirement to confirm the effect via stack testing (condition 15), and to implement mitigation or remediation if proved necessary. Ms Smith recommends a condition which requires annual in stack PM_{10}monitoring. Mr Cudmore states that if Alliance can operate the CFBs within the proposed ambient limits for PM_{10} without breaching any of these ambient PM_{10} concentration trigger levels then there would little reason or need to undertake annual stack for further good measure. In his opinion, that would be a very inefficient use of resources with little benefits to be gained.

6.15 As noted the proposed monitoring programme also applies to $PM_{2.5}$ and this is intended to assist in informing BPO based review obligations set out in condition 17 in particular, and acknowledges that $PM_{2.5}$ limits might ultimately find their way into future national or regional planning documents.

6.16 Commencing at Year 10 of the consent, and repeated at five yearly intervals thereafter, Alliance would be required to undertake an extensive investigation as to whether its air discharges, in particular its particulate emissions are achieving BPO obligations. If any improvements are identified as part of the process, then these shall be implemented by Alliance.

6.17 Conditions 18 to 25 relate to the rendering plant operations and seek to appropriately manage this activity to mitigate any adverse odour effects. Conditions 26 to 32 relate more generally to the management of odours from the site. This includes the management of current and potential future odours and discharges (biogases) arising from the proposed wastewater treatment upgrade.

Water Abstraction and Channel Maintenance

6.18 The proposed abstraction and channel maintenance from the Oreti River is to be managed via key conditions which:

(a) Limit the quantum of the take;

(b) Requiring monitoring;

(c) Require the implementation of water conservation measures when flows in the river become lowered;

(d) Require the maintenance and upgrade to a finer fish screen to further minimise the likelihood of fish entrainment in the intake structure;

(e) Require that scheduled channel maintenance is undertaken to avoid key fish migration and spawning times;

(f) Require that channel works are kept to a minimum and that prior to works the channel is inspected for the presence of eels, which if found shall be transferred to the main stem of the Oreti River.

Short Term Wastewater Storage

6.19 Conditions are also proposed to ensure that if land is used as a short term emergency storage option to store treated wastewater that it does not exceed a maximum period of three months and that odour is appropriately monitored and reported.

7. PART 2 ASSESSMENT

7.1 Chapter 10, section 10.11 of the AEE provides an assessment of the various applications against Part 2 of the RMA. That assessment concludes that the proposal will promote the sustainable management of natural and physical resources and is consistent with the purpose and principles of the RMA. Having reviewed the additional material presented in the submissions, the section 42A report and evidence on behalf of Alliance, I continue to support the conclusions made in the AEE for the following reasons.

Section 5

7.2 The ongoing operation, maintenance, and upgrading of the Plant will benefit the regional and local community, as it will provide direct and indirect economic and social effects such as ongoing employment and support to

the rural industry in Southland. The site is appropriately zoned and sited for industrial uses, and its operations are not currently having any significant adverse effect on the surrounding environment.

7.3 It is acknowledged that there is a national and regional mandate with regard to discharges to water and to air in particular to maintain and where possible make improvements. Alliance is being proactive in this regard and is committed to progressively improving the quality of its discharges to water, air and to land. This is an appropriate response in my view as it takes into account the current state of play in terms of effects, the likely future changes in the environment and regulatory controls, and also enables Alliance to commit to the investment in technological improvements and upgrades across a timeframe which recognises the significant costs involved.

Section 6

7.4 I am of the opinion that the applications recognise and provide for the matters in section 6 of the RMA, and in particular:

(a) The Makarewa River is a highly modified river with substantially reduced natural character values. As discussed by Dr James, it does not appear that the discharge itself is having an adverse effect on water quality and ecosystem health in the river. More stringent compliance limits with respect to ammonia being proposed to apply on an interim basis followed by a step change at year 15 post upgrade will also enhance water quality.

(b) Mr Montgomerie considers that the proposed abstraction and channel maintenance work within the Oreti River are minor, and will therefore not have any significant impact on existing natural character values in the river in terms of its hydrological functions, water quality and ecosystem health.

(c) I acknowledge that the New River Estuary has been identified as an outstanding natural feature in the Invercargill Proposed District Plan, and its values have been recognised as being of national significance in other regional documents. Water quality in the New River Estuary is declining due to the cumulative impact of point and non-point discharge sources, and it is evident that Alliance is committed to

contributing to any catchment wide initiatives to make improvements in this regard.

(d) Aside from the New River Estuary, the assessments have not found there to be any significant indigenous vegetation or significant habitats within the immediate receiving environment of the Plant. That said, the mitigation including the wastewater treatment plant upgrade is likely to result in improvements in water quality and habitat within the immediate Makarewa River environment, and an improvement in downstream sites could be achieved as a result of an overall catchment wide enhancement programme.

(e) The existing level of public access to and around the rivers within the vicinity of the Plant will not be affected by the activities proposed. I also note that the physical difficulties in accessing the Makarewa River near the Plant is a limiting factor in this regard.

(f) The relationship with Maori and their culture and traditions with their ancestral lands, water, sites, wahi tapu, and other taonga has been recognised by Alliance through the engagement with Te Ao Marama, and the development of mitigation measures in response to response to potential cultural effects. I am also not aware of any impact on any recognised customary activities.

Sections 7 and 8

7.5 It is my opinion that the applications have also had particular to, and have appropriately responded to the matters in sections 7 and 8 of the Act. I consider the following points to be particularly relevant:

(a) The kaitiakitanga of tangata whenua has been recognised in seeking the preparation of a cultural values report and ongoing engagement with Te Ao Marama.

(b) The ethic of stewardship has been recognised through engagement with and participation of tangata whenua as part of the TWP, as well as other key stakeholders forming part of this group, as well as consultation with community groups who have specific interest in and/or who have exercised stewardship over particular resources.

(c) The efficient use and development of resources is achieved by the fact that the Plant is an existing resource, and there is significant investment costs in the location and equipment at the site, and that the Plant is appropriately located to receive livestock to support the surrounding agricultural and farming activity, as well as being close to existing infrastructure such as roads and rail networks. The site is also of sufficient size to enable ongoing development, upgrading and expansion.

(d) In my opinion compliance with the proposed and future limits set out in the conditions will ensure that the intrinsic values of ecosystems present within the receiving environment are maintained and potentially enhanced with the proposed mitigation.

(e) As noted the Plant is located within a site that is zoned for industrial purposes, and a reasonable buffer between the on-site activities and sensitive adjacent receptors exists to avoid, or mitigate any potential adverse effects on amenity values.

(f) Overall the quality of the environment will be improved through the upgrading and mitigation measures that are being proposed.

(g) The assessments relating to water quality and ecological effects has found that the Oreti and Makarewa River (including the lower area) supports a significant trout population, which is also confirmed in the submission of Fish and Game. A fish health survey is proposed as part of the conditions of consent relating to the discharge to water, to determine whether the upgrade of the wastewater treatment plant will have a positive effect on current fish health.

(h) I understand that there are no Treaty of Waitangi matters that are relevant to these applications.

8. CONCLUSION

8.1 After considering the matters relevant under section 104 and Part 2 of the RMA, I am of the view that the applications are consistent with the purpose of the RMA and constitute sustainable management of natural and physical resources for the following reasons:

(a) The proposed activities allow the use of natural and physical resources in a way which enables the Plant to continue to make a positive contribution to the wellbeing of the people and communities in the Southland region.

(b) The proposed activities will be generally consistent with the provisions of the Freshwater NPS and the proposed upgrades will work in concert with the Regional Council's initiatives to set and implement a water quality management framework for the catchment in accordance with National directives.

(c) The proposed activities are consistent with the provisions set out in the RPS to achieve integrated management of the natural and physical resources of the Southland region.

(d) The proposed activities, in particular the proposal to upgrade and improve the quality of Alliance's discharges to water, air and land are consistent with the objectives and policies contained in the various Southland Regional Plans.

(e) The proposed activities will sustain the potential of natural and physical resources to meet the reasonably foreseeable needs of future generations.

(f) The proposed activities will safeguard the life-supporting capacity of air, water and soil, and adverse effects would be appropriately avoided, remedied or mitigated

J C KYLE

4 July 2016

APPENDIX A

SUMMARY OF RECENT EXPERIENCE

- Queenstown Lakes District Council – preparation of a Plan Change to expand Queenstown town centre, including to accommodate a convention centre.
- Environmental Protection Authority – advisor to the Minister appointed Board of Inquiry regarding a Plan Change by Tainui Group Holdings and Chedworth Properties for the Ruakura Inland Port Development, Hamilton.
- Wellington International Airport Limited – strategic and resource management advice with respect to revised Airport Master Plan and Runway Extension – Wellington City.
- Environmental Protection Authority – advisor to the Minister appointed Board of Inquiry regarding a Notice of Requirement and resource consent applications by the New Zealand Transport Agency with respect to the Expressway between Peka Peka and Otaki on the Kapiti Coast.
- Environmental Protection Authority – advisor to the Minister appointed Board of Inquiry regarding a Notice of Requirement and resource consent applications by the New Zealand Transport Agency with respect to the Expressway between MacKays Crossing and Peka Peka on the Kapiti Coast.
- Environmental Protection Authority – advisor to the Minister appointed Board of Inquiry regarding resource consent applications and designations by the New Zealand Transport Agency with respect to the proposed Transmission Gully Project – Wellington Region.
- Environmental Protection Authority – advisor to the Minister appointed Board of Inquiry regarding resource consents by the New Zealand Transport Agency and a Plan Change proposal by the New Zealand Transport Agency to change the Wellington Regional Water Plan associated with proposed Transmission Gully Road of National Significance – Wellington Region.
- Wellington International Airport Limited – Scoping of designations and resource consents for improving degree of CAA compliance – Wellington City.
- Wellington International Airport Limited – Runway Extension Project – Lyall Bay – Wellington City.
- Alliance Group – advisor regarding various regional and district plans – nationwide.
- Alliance Group Limited – Consents – Lorneville and Pukeuri Meat Processing Works - Otago and Southland Regions.
- TrustPower Limited – Proposed alteration to the Rakaia Water Conservation Order – Lake Coleridge Hydro Electric Power Scheme – Canterbury Region.

- Meridian Energy Limited – Proposed Mokihinui Hydro Electric Power Scheme, damming, water and land use related consents, Buller District and West Coast Region.
- TrustPower Limited – Wairau Hydro Electric Power Scheme, water and land use related consents, Marlborough District.
- Sanford Limited, various marine farm proposals Marlborough Sounds, Marlborough District.
- Genesis Power Limited – due diligence Slopedown Wind Farm, Southland District and Southland Region.
- Port Marlborough Limited – Plan Change proposal to alter the marina zone within the Marlborough Sounds Resource Management Plan to provide for consolidation of marina development in Waikawa Bay, Marlborough District.
- Irmo Properties Limited – Resource consent application for retail complex, Green Island – Dunedin City.
- Port Marlborough Limited – Resource consent application for occupation of coastal space – Shakespeare Bay port facilities – Marlborough District.
- Meridian Energy Limited – Proposed Wind Farm, Lammermoor Range, Central Otago District and Otago Region.
- Riverstone Holdings Limited – Proposed Monorail Link – Lake Wakatipu to Fiordland, Department of Conservation Concession Application – Southland Conservancy.
- Otago Regional Council – Consents required for controlling the Shotover River to mitigate flood risk – Queenstown Lakes District and Otago Region.
- Queenstown Airport Corporation – Runway End Safety Area, designation and construction related consents, Queenstown Lakes District and Otago Region.
- Queenstown Airport Corporation – aircraft noise controls – Plan Change and Designation, Queenstown Lakes District.
- Queenstown Airport Corporation – aircraft flight fan controls – Designation, Queenstown Lakes District.
- Queenstown Airport Corporation – Notice of Requirement for land adjacent to QAC in order provide for the future expansion of airport operations, Queenstown Lakes District.
- Ryman Healthcare Ltd – consenting of proposed retirement villages – Auckland, Waikato, Manawatu, Wellington, Canterbury and Otago.
- Infinity Investment Group – Pegasus Town, North Canterbury – Waimakariri District, Canterbury Region.

- TrustPower Limited – Proposed Kaiwera Downs Wind Farm, Gore District and Southland Region.
- Willowridge Developments – 3 Parks Plan Change to create new commercial, large format retail, service, tourist and residential land use zones, Wanaka, Queenstown Lakes District.

APPENDIX B

Proposed Conditions

Details of Permit – Treated Wastewater to Water

Purpose for which permit is granted:		To discharge treated meat processing wastewater and sewage from the township of Wallacetown, to water
Location	- site locality	Lorneville
	- map reference	E46:476:182
	- catchment	Oreti
Legal description of land at the site:		Riverbed, adjacent to Sec 58 Block XIV Invercargill Hundred
Term:		This consent will expire on (35 years post grant)

Schedule of Conditions

General Conditions

1. Subject to complying with the conditions of this consent, the activities authorised by this consent shall be undertaken so as to be consistent with the application for this consent and the documents entitled:
   (a) Assessment of Environmental Effects dated December 2015
   (b) Technical Reports:
   - Appendix D – Assessment of the Receiving Environment for Alliance's Lorneville Wastewater Discharges
   - Appendix I – Summary Report on Alternatives and Proposed Upgrading of the Wastewater Treatment Plant
   - Appendix K – Assessment of Effects of the Wastewater Discharge
   - Appendix L – Makarewa River Water Quality Monitoring Plan
   - Appendix T – Draft Environmental Monitoring Plan

2. This resource consent authorises the discharge of up to 22,730 m^3/day of treated wastewater from the Alliance Lorneville waste water treatment plant to the Makarewa River at the location specified above.

Environmental Monitoring Plan

3. Prior to the commencement of this consent the consent holder shall prepare and submit to the consent authority an Environmental Monitoring Plan (EMP) for certification. The EMP shall be prepared in general accordance with the draft plan provided with the documents and information provided as part of the Assessment of Environmental Effects dated November 2015. The purpose of the EMP shall be to describe the methods for monitoring the physical characteristics and water quality parameters of the discharge, and the physical, water quality and biological characteristics and parameters of the Makarewa River receiving waters as prescribed by this consent. It shall include but not be limited to:

(a) the inclusion of a description and maps identifying the monitoring sites specified in condition 4 below;

(b) a description of the methods to undertake the following monitoring requirements:

(i) discharge stream monitoring
(ii) water quality monitoring
(iii) aquatic biological monitoring
(iv) fish health survey
(v) sediment sampling.

The EMP shall be reviewed by the consent holder at five yearly intervals. The purpose of this review shall be to identify any amendments necessary to the EMP to ensure it remains effective in meeting its purpose. Should amendments to the EMP be made a revised copy shall be submitted to the consent authority.

4. The EMP shall include a description of the monitoring sites including the location/s where monitoring of the discharge prior to entry into the Boiler Ditch will occur, and monitoring sites within the Makarewa River upstream and downstream of the discharge point to be utilised for control and compliance monitoring. These monitoring sites shall be as follows:

(a) At a point where the discharge enters the "Boiler Ditch" as described and shown in the EMP.

(b) The Makarewa River upstream site is located beyond the point in the river which is subject to tidal influences, approximately 2,000 metres above the treated wastewater outfall into the river as shown in the EMP.

(c) The downstream "compliance" site is located immediately downstream of the zone of reasonable mixing approximately 350 metres below the discharge outfall as shown in the EMP.

Monitoring

5. The monitoring of the discharge and the receiving Makarewa River water quality shall be undertaken at the locations and frequencies specified in the EMP and in accordance with the detail set out within these conditions, including Schedules A and B.

6. Within five years of the consent commencing and again immediately prior to the Wastewater Treatment Upgrade required by conditions 12 and 14 the consent holder shall undertake aquatic biological monitoring. This monitoring shall occur during the period 1 December to 30 April following a period of at least 20 consecutive days below annual median river flow. The method for undertaking this monitoring shall be set out within the EMP. This monitoring shall be used to establish a baseline indication of benthic invertebrate community health in order to enable subsequent comparative analyses to be made post the Wastewater Treatment Upgrade required by conditions 12 and 14.

7. (a) Within five years of the consent commencing and again immediately prior to the Wastewater Treatment Upgrade required by conditions 12 and 14, the consent holder shall undertake a fish health survey within the Makarewa River of resident species such as tuna. A description of the purpose and method for undertaking this monitoring shall be set out within the EMP.

(b) Within five years of the consent commencing, and every five years thereafter, the consent holder shall sample sediments within the Makarewa River at both the

upstream and downstream locations identified within condition 6 in order to determine levels of TN, TP and TOC. Results shall be compared to those historically obtained during the term of the previous consent.

Treated Wastewater Limits – Pre Wastewater Treatment Plant Upgrade

8. (a) The consent holder shall ensure that the treated wastewater complies with the following limits at the monitoring site at the point of discharge to the Boiler Ditch as identified in the EMP.

Parameter	*Limit*
Carbonaceous BOD_5	30 g/m^3
Total Suspended Solids	110 g/m^3
Total Nitrogen	180 g/m^3
Total Phosphorous	20 g/m^3
Faecal Coliforms	45,000 cfu/100mls

(b) In circumstances where one or more of the limits set out in Condition 8(a) are exceeded on two consecutive sampling occasions, the consent holder shall report to Environment Southland in accordance with condition 25. Where the Council determines that it is necessary to do so, the consent holder shall adhere to the protocols set out within subsections (a) to (d) of that condition.

Advice Note: The limits contained in Condition 8 are designed to ensure the quality of the wastewater discharge does not deteriorate from the levels existing at the time this consent was granted. The limits have been derived from the 95th%ile of the 5 year dataset derived from 1 October 2010 to 30 June 2015, a period that encompassed a range of climatic and processing variances.

8a. From the third anniversary of the commencement of this consent, the consent holder shall ensure that the total annual load with regard to Total Nitrogen in the discharge does not exceed 255 tonnes/year. In circumstances where this total annual load is exceeded, the consent holder shall report to Environment Southland in accordance with condition 25. Where the Council determines that it is necessary to do so, the consent holder shall adhere to the protocols set out within subsections (a) to (d) of that condition.

Makarewa River Receiving Water Discharge Limits – Pre Wastewater Treatment Plant Upgrade

9. For the purpose of determining compliance with these conditions the zone of reasonable mixing shall comprise the area of river bounded by the point on the Makarewa River 350 metres downstream of the treated wastewater outfall into the river (the downstream compliance site). Where comparison with upstream receiving water quality or other parameters is required, the results from immediately downstream of the zone of reasonable mixing shall be compared with results from monitoring the river at a point upstream which shall be beyond the point in the river which is subject to tidal influences as set out in condition 4.

10. The consent holder shall ensure that the following standards are complied with as a result of the exercise of this consent, immediately downstream of the zone of reasonable mixing defined in condition 9 above:

(a) Daily maximum temperature of the receiving water shall not be increased by more than 3°C when the natural temperature is <16°C, and not more than 1°C when the natural temperature is >16°C when compared with the upstream control monitoring site referred to in condition 9, and shall at no time exceed a maximum temperature of 23°C.

(b) The pH of the receiving water shall be within the range of 6.5 – 9.0.

(c) Water clarity[1] shall not be reduced by more than 33% when compared with the upstream control monitoring site referred to in condition 9.

(d) There shall be no conspicuous oil or grease films, scums, foams or floatable or suspended materials produced as a result of the discharge.

(e) The dissolved oxygen concentrations of the receiving water shall be consistently maintained at not less than 6g/m^3 and shall not on any occasion be less than 5g/m^3. For the purposes of this condition, the term "consistently maintained" shall mean at the required level for 96% of the samples taken in any year.

(f) The soluble BOD_5 concentration of the receiving water shall not exceed 2 g/m^3, in more than 10% of annual samples, except where this is being exceeded upstream of the discharge.

(g) The concentration of total oxidised nitrogen within the receiving water shall not exceed an annual median of 2.4 g/m^3 and an annual 95%ile of 3.5 g/m^3.

(h) The concentration of total ammonia nitrogen within the receiving water shall not exceed the following values at the defined pH and temperature:

Total Ammonia Concentration g/m^3			
pH	30 day Rolling Average and Annual Median (3.75 g/m^3 @pH 8.0)	4 day Rolling Average Maximum (4.75 g/m^3 @pH 8.0)	Annual 95th % ile (4.5 g/m^3 @pH 8.0)
6.5	10.3	13.0	12.3
6.6	10.1	12.8	12.1
6.7	9.9	12.6	11.9
6.8	9.7	12.3	11.6
6.9	9.4	11.9	11.3
7.0	9.1	11.5	10.9
7.1	8.7	11.1	10.5
7.2	8.3	10.5	10.0
7.3	7.8	9.9	9.4
7.4	7.3	9.2	8.7
7.5	6.7	8.5	8.1
7.6	6.1	7.8	7.3
7.7	5.5	7.0	6.6
7.8	4.9	6.2	5.9
7.9	4.3	5.5	5.2
8.0	3.7	4.7	4.5
8.1	3.2	4.1	3.9
8.2	2.8	3.5	3.3

[1] Water clarity shall be assessed using the Clarity Tube method or such other method approved by the Southland Regional Council.

8.3	2.3	3.0	2.8
8.4	2.0	2.5	2.4
8.5	1.7	2.1	2.0
8.6	1.4	1.8	1.7
8.7	1.2	1.5	1.4
8.8	1.0	1.3	1.2
8.9	0.9	1.1	1.0
9.0	0.7	0.9	0.9

11. The limits set out in condition 10 shall apply until such time as the consent holder has fully implemented the wastewater treatment upgrades in accordance with conditions 12 and 14.

Wastewater Treatment Upgrade

12. Within five years of the commencement of this consent, the consent holder shall prepare and submit to the consent authority a Wastewater Treatment Upgrade Plan. This Plan shall identify the technology and wastewater treatment plant upgrades necessary to improve the quality of the wastewater discharged to the Makarewa River in order to meet the standards and limits set out in condition 15 below.

    (a) The Wastewater Treatment Upgrade Plan shall include, but not be limited to, the following matters:

        (i) A description of the proposed technology and wastewater plant upgrades to be installed including its operational requirements and management;

        (ii) A description of the methodology of how the wastewater plant upgrades will be installed and a staged work plan describing the timing associated with the progressive implementation of these works;

        (iii) The monitoring and reporting obligations associated with the wastewater treatment plant upgrades.

13. Once the Wastewater Treatment Upgrade Plan has been prepared and submitted to the consent authority, the consent holder shall commence reporting to the consent authority on an annual basis to identify its progress towards implementation and commissioning of the wastewater treatment plant upgrade (in accordance with the work plan required by condition 12(a)(iii)). This reporting shall describe any interim measures undertaken to improve the quality of the discharge, or physical plant works or operational changes associated with the upgrade.

14. The consent holder shall ensure that the upgrade of the wastewater treatment plant is fully commissioned and operational within fifteen years of the commencement of this consent.

15. Within fifteen years of the commencement of this consent, the consent holder shall ensure that the following receiving water discharge limits are complied with, immediately downstream of the zone of reasonable mixing defined in condition 9 above (downstream compliance site):

    (a) Daily maximum temperature of the receiving water shall not be increased by more than 3°C when the natural temperature is <16°C, and not more than 1°C when the natural temperatures is >16°C when compared with the upstream control

monitoring site referred to in condition 9 and shall at no time exceed a maximum temperature of 23°C.

(b) The pH of the receiving water shall be within the range of 6.5 – 9.0.

(c) Water clarity shall not be reduced by more than 33% when compared with the upstream control monitoring site referred to in condition 9.

(d) The dissolved oxygen concentrations of the receiving water shall be consistently maintained at not less than 6g/m^3 and shall not on any occasion be less than 5g/m^3. For the purposes of this condition, the term "consistently maintained" shall mean at the required level for 96% of the samples taken in any year.

(e) The soluble BOD_5 concentration of the receiving water shall not exceed 2 g/m^3, in more than 10% of annual samples except where this is being exceeded upstream of the discharge.

(f) There shall be no conspicuous oil or grease films, scums, foams or floatable or suspended materials produced as a result of the discharge.

(g) The concentration of total ammonia nitrogen within the receiving water shall not exceed the following values at the defined pH:

Total Ammonia Concentration g/m^3			
pH	30 day Rolling Average and Annual Median (1.9 g/m^3 @pH 8.0)	4 day Rolling Average Maximum (4.75 g/m^3 @pH 8.0)	Annual 95th % ile (2.4 g/m^3 @pH 8.0)
6.5	5.2	13.0	6.6
6.6	5.1	12.8	6.5
6.7	5.0	12.6	6.3
6.8	4.9	12.3	6.2
6.9	4.8	11.9	6.0
7.0	4.6	11.5	5.8
7.1	4.4	11.1	5.6
7.2	4.2	10.5	5.3
7.3	4.0	9.9	5.0
7.4	3.7	9.2	4.7
7.5	3.4	8.5	4.3
7.6	3.1	7.8	3.9
7.7	2.8	7.0	3.5
7.8	2.5	6.2	3.1
7.9	2.2	5.5	2.8
8.0	1.9	4.7	2.4
8.1	1.6	4.1	2.1
8.2	1.4	3.5	1.8
8.3	1.2	3.0	1.5
8.4	1.0	2.5	1.3
8.5	0.8	2.1	1.1
8.6	0.7	1.8	0.9
8.7	0.6	1.5	0.8
8.8	0.5	1.3	0.7
8.9	0.4	1.1	0.6
9.0	0.4	0.9	0.5

(h) The concentration of total oxidised nitrogen shall not exceed an annual median of 2.4 g/m^3 and an annual 95%ile of 3.5 g/m^3 within the receiving water.

16. (a) Within fifteen years of the commencement of this consent, the consent holder shall ensure that the treated wastewater complies with the following limits at the monitoring site at the point of discharge to the Boiler Ditch as identified in the EMP.

Parameter	Limit
Carbonaceous BOD_5	30 g/m^3
Total Suspended Solids	110 g/m^3
Total Nitrogen	45 g/m^3
Total Phosphorus	11 g/m^3
Faecal Coliforms	45,000 cfu/100mls

(b) In circumstances where one or more of the limits set out in Condition 16(a) are exceeded on two consecutive sampling occasions, the consent holder shall report to Environment Southland in accordance with condition 25. Where the Council determines that it is necessary to do so, the consent holder shall adhere to the protocols set out within subsections (a) to (d) of that condition.

17. Once the upgraded Wastewater Treatment Plant required by conditions 12 and 14, has been commissioned and has been fully operational for twelve months, the consent holder shall engage an appropriately qualified and independent water quality expert to review the post upgrade limits for Total Nitrogen and Total Phosphorus set out in accordance with condition 16. The purpose of this review shall be to determine whether these limits are appropriate for the purposes of maintaining and enhancing water quality in the Makarewa River and the review shall include:

(a) An evaluation of the monitoring results with regard to these limits

(b) A review of relevant guidelines or standards for these parameters applicable at the date of the review, and other catchment wide improvements relating to water quality.

A copy of this review shall be provided to the consent authority. The consent holder's obligations to undertaken this review and the associated reporting process shall completed within six months after being initiated. If this review recommends that amendments to these limits are necessary, then the consent authority may initiate a formal review of the post upgrade limits for these parameters in accordance with condition 34.

18. Within five years of the commencement of this consent the consent holder shall undertake a review of:

(a) The current microbial load within the discharge stream and an evaluation of its actual or potential effects on the Makarewa River environment and public health;

(b) Relevant guidelines or standards for the management of microbes in points source discharges applicable at the date of the review, and other catchment wide improvement relating to water quality;

(c) The best practicable option (as defined in section 2 of the RMA) for the management of the microbial load in the discharge stream.

18a. The review shall require the consent holder to identify if there is a need to implement additional methods for managing the adverse effects of microbes in the wastewater discharge stream to ensure adherence to best practicable option obligations. The review shall detail any additional technology that is necessary and could be installed as part of the overall wastewater treatment upgrade plan to manage the adverse effects of microbes in the discharge stream.

18b. A report detailing the review shall be provided to a suitably qualified, independent water quality expert for verification that the review has been undertaken in accordance with achieving the best practicable option for managing the adverse effects of microbes in the wastewater discharge stream. The results of the review, and the advice received from the independent water quality expert shall be reported to the consent authority immediately upon completion of the review. The consent holder's obligations to undertake this review and the associated reporting process shall be completed not more than six months after being initiated.

18c. The consent authority shall be required to be satisfied that the review has properly assessed the best practicable option for managing any actual or potential effects arising from microbes in the wastewater discharge stream and that any necessary technological upgrades are included as part of the progressive wastewater treatment plant upgrade. The consent authority shall certify the review report once it is satisfied that the requirements of this condition have been met.

18d. The consent holder shall be required to implement any suggested measures as part of the progressive wastewater plant upgrade. Within twelve months of commissioning any measures the consent holder shall provide a report to the consent authority that confirms that the work has been completed and which details future monitoring requirements and expected limits for *E.coli* or faecal coliforms in the discharge stream and/or receiving Makarewa River. The consent holder shall meet these monitoring requirements and limits for the remainder of the term of this consent, and/or the consent authority may initiate a review in accordance with condition 33 to amend the limits specified in condition 16.

18e. If the review determines that it is not necessary to implement additional treatment measures as part of the progressive wastewater plant upgrade to further reduce the microbial load within the discharge stream, then the consent holder shall be required to reassess this requirement every five years thereafter for the duration of this consent.

19. Following the commissioning and operation of the wastewater plant upgrade required by conditions 12 and 14 the consent holder shall undertake aquatic biological monitoring. This monitoring shall occur on an annual basis for a period of not less than three consecutive years during the period 1 December to 30 April following a period of at least 20 consecutive days below annual median river flow. The method for undertaking this monitoring shall be set out within the EMP. This monitoring shall be used to establish any changes that have occurred between the baseline assessment undertaken in accordance with condition 6 and the state of benthic invertebrate community health post the Wastewater Treatment Upgrade. The results of this monitoring shall be reported to the consent authority upon completion of this three year period of monitoring.

20. Within two years of the commissioning and operation of the wastewater plant upgrade the consent holder shall repeat the fish health monitoring survey undertaken in accordance with condition 7. The purpose of the survey shall be to determine what if any

improvement in fish health has occurred post upgrade of the wastewater treatment plant. The results of this monitoring shall be compared to the results of the monitoring carried out prior to the wastewater treatment upgrade and shall be reported to the consent authority upon completion of this survey.

21. Within five years of the commissioning and operation of the wastewater plant upgrade the consent holder shall conduct a review of:

    (a) The performance of the up-graded wastewater treatment plant;

    (b) The effects of the discharge of wastewater within the receiving waters of the Makarewa River;

    (c) The improvements to water quality that have occurred within the Oreti River catchment as a result of the policy and management imperatives undertaken by the consent authority and resource users to progressively improve water quality in response to national policy relating to freshwater management;

    (d) The best practicable option (as defined in section 2 of the RMA) to assess current state of wastewater treatment technology and practicalities to make further improvements to the wastewater treatment plant to further improve the quality of the discharge.

    This review shall require the consent holder to confirm that the upgrade has been successful in its purpose in achieving an improvement in the quality of the wastewater discharge, and compliance with the limits specified in condition 15 has been achieved, and consideration as to whether there is a need to implement additional methods for managing the effects of the wastewater discharge on water quality and ecology within the Makarewa River in accordance with the best practicable option obligations.

    A report detailing the review shall be provided to a suitably qualified, independent water quality expert for verification that the review has been undertaken in accordance with the above requirements of this condition. The results of the review, and the advice received from the independent water quality expert shall be reported to the consent authority immediately upon completion of the review. The consent holder's obligations to undertake this review and the associated reporting process shall be completed not more than six months after being initiated.

    The consent authority shall certify the review report once it is satisfied that the requirements of this condition have been met.

    The consent holder shall be required to implement any suggested improvements that may be specified in the report.

<u>Habitat Enhancement Plan</u>

22. Within one year of the commencement of this consent, the consent holder shall prepare and submit to the consent authority a Habitat Enhancement Plan which identifies habitat enhancement priorities to be carried out within the Plant's property. This Plan shall be prepared in consultation with Te Ao Marama. The Habitat Enhancement Plan shall incorporate, but not be limited to the following:

    (a) The methods to ensure ongoing liaison between the consent holder and Te Ao Marama in the development and maintenance of the Habitat Enhancement Plan.

(b) The protocols to be followed to identify areas for habitat enhancement and the development of a prioritised work programme over the first 15 years of the consent term.

(c) Details about the work programme and habitat enhancement priorities and how these will be implemented over a series of defined stages and managed over time. Likely habitat enhancement priorities will include planting and ecological restoration work at the ox-bow area, riparian planting at appropriate places on the margin of the Makarewa River and at other surface water bodies on the consent holder's site.

(d) Specific monitoring that is required to ensure that the habitat enhancement work is successful.

(e) Reporting and review protocols.

Reporting

23. The following additional reporting requirements shall apply both before and after the wastewater upgrade required by conditions 12 and 14.

24. The monthly results of the discharge and receiving water monitoring carried out in accordance with the conditions of this consent shall be supplied to the consent authority no later than 20 working days after the laboratory analytical data has been received by the consent holder.

25. The consent authority shall be notified within 24 hours of the identification of any exceedance of a limit prescribed by the conditions of this consent. This notification shall include advice of any corrective actions taken by the consent holder. An incident report shall be provided to the consent authority within 20 working days of the notification of the exceedance. This report shall include:

(a) Identification of the likely cause of the limit exceedance;

(b) The resulting effects on the receiving environment likely to arise because of the limit exceedance;

(c) The management responses undertaken or which may be necessary to prevent any further limit exceedances occurring;

(d) Remedial action undertaken or which may be necessary.

26. On an annual basis the consent holder shall prepare and submit an Annual Monitoring Report to the consent authority. The report shall cover the 1 October to 30 September period and shall be provided to the consent authority by 30 November each year. It shall include:

(a) A summary of receiving water monitoring results and assessment of compliance with the limits prescribed by this consent;

(b) An assessment of the annual median and 95%ile of the total ammonia nitrogen concentrations in the receiving water against an annual median of 1.9 g/m^3 and an annual 95%ile of 2.4g/m^3 (both at pH 8.0);

(c) An assessment of the annual median and 95%ile of the total oxidised nitrogen concentrations in the receiving water against an annual median of 2.4 g/m^3 and an annual 95%ile of 3.5 g/m^3

(d) A calculation of the annual discharged loads of ammonia nitrogen, total oxidised nitrogen, total nitrogen and total phosphorus and a comparative analysis of these loads against preceding seasons.

Technical Working Party Consultation

27. The consent holder shall facilitate the continuation of the Lorneville Wastewater Technical Working Party and shall distribute the annual monitoring report described in condition 26 to the members of the working party.

28. The Lorneville Wastewater Technical Working Party shall comprise representatives from the consent holder, the Southland Fish and Game Council, the Department of Conservation, Te Ao Marama Incorporated, Wallacetown community representative, Public Health South, Invercargill City Council, Southland District Council and the consent authority. The consent holder shall be responsible for convening meetings, the provision of a venue for meetings and providing any necessary administrative support to the working party.

29. Should any of the external parties referred to in condition 28 chose not to continue to be part of the Lorneville Wastewater Technical Working Party then the consent holder shall not be deemed to be in breach of these conditions.

30. The purpose of the Lorneville Wastewater Technical Working Party shall be to receive reports, review results, initiate meetings as required and identify any required reviews of consent conditions. The consent holder shall consult with the Lorneville Wastewater Technical Working Party as part the reviews required by Conditions 3 and 17.

Review Conditions

31. In accordance with section 127 of the Resource Management Act 1991, the consent holder may, within two years of the commissioning of the wastewater treatment upgrade undertaken pursuant to conditions 12 and 14, apply to change or cancel the conditions of this consent to reflect the measured performance and ongoing monitoring and reporting obligations associated with the wastewater treatment system upgrade.

32. The consent authority may, within three months of receiving a report required by condition 26 of this consent, serve notice on the consent holder under section 128 of the Resource Management Act 1991 of its intention to review the conditions of this consent. The purpose of such a review is to assess the significance of any exceedance of the discharge limits set out in conditions 8 and 16, and to determine whether these limits should be altered, or whether the exceedance has resulted in significant adverse effects.

33. The consent authority may, within three months following the review required by condition 18 serve notice on the consent holder under section 128 of the Resource Management Act 1991 of its intention to review the conditions of this consent for the express purpose of imposing a revised Faecal Coliform or *E.coli* limit necessary to complement additional treatment measures arising from actions to give effect to that condition and in particular to further reduce the microbial load within the discharge stream.

34. The consent authority may, within three months of receiving the recommendations from the review of the post upgrade limits of Total Nitrogen, and Total Phosphorus required by

condition 17 of this consent serve notice on the consent holder under section 128 of the Resource Management Act 1991 of its intention to review the limits for Total Nitrogen and Total Phosphorous stipulated in condition 16 to ensure that they remain appropriate or whether any changes to these limits are necessary.

35. The consent authority may, within three months of receiving a report required by condition 21 of this consent, serve notice on the consent holder under section 128 of the Resource Management Act 1991 of its intent to review the conditions of this consent. The purpose of such a review is to assess the improvements made to the quality of the discharge arising from the wastewater treatment upgrade while having regard to improvements that have been made to the overall quality of water in the Makarewa River as a result of the consent authority's programme of catchment improvement and to require any amendments to the discharge and/or receiving water limits.

Schedule A1. Treated Wastewater Discharge Monitoring Schedule for the Period 1 October to 31 May each year when discharging

Parameter	Daily (When discharging)	Weekly (when discharging)
Volume	X	
Electrical Conductivity	X	
pH	X	
Temperature	X	
Dissolved oxygen concentration*	X	
Total ammoniacal nitrogen	X	
Total nitrogen		X
Total oxidised nitrogen		X
Total phosphorus		X
Dissolved reactive phosphorous		X
Total suspended solids		X
Volatile suspended solids		X
Carbonaceous BOD		X
Faecal coliforms		X
E-coli		X

Schedule A2. Treated Wastewater Discharge Monitoring Schedule for the Period 1 June to 30 September each year when discharging

Parameter	Daily (When discharging)	Weekly (when discharging)	Monthly (when discharging)
Volume	X		
Electrical Conductivity		X	
pH		X	
Temperature*		X	
Dissolved oxygen concentration		X	
Total ammoniacal nitrogen		X	
Total nitrogen		X	
Total oxidised nitrogen		X	
Total phosphorus		X	
Dissolved reactive phosphorous			X
Total suspended solids			X
Volatile suspended solids			X
Carbonaceous BOD			X
Faecal coliforms			X
E-coli			X

Schedule B1. Receiving Water Monitoring Schedule for the Period 1 October to 31 May each year: Upstream Control site and Compliance site

Parameter	Daily When discharging	Weekly When discharging	Weekly No discharge	Monthly No discharge
Electrical Conductivity	X		X	
pH	X		X	
Temperature	X		X	
Dissolved oxygen concentration	X		X	
Foams and scums	X		X	
Total ammoniacal nitrogen	X		X	
Total oxidised nitrogen		X	X	
Total nitrogen		X	X	
Total phosphorous		X	X	
Dissolved reactive phosphorous		X		X
Total suspended solids		X		X
Carbonaceous BOD		X		X
Soluble carbonaceous BOD		X		X
Faecal coliforms		X		X
E-coli		X		X
Turbidity		X		X
Clarity Tube		X		X

Schedule B2. Receiving Water Monitoring Schedule for the Period 1 June to 30 September each year: Upstream Control site and Compliance site

Parameter	Weekly	Monthly
	Discharge / No discharge	
Electrical Conductivity	X	
pH	X	
Temperature	X	
Dissolved oxygen concentration	X	
Foams and scums	X	
Total ammoniacal nitrogen	X	
Total oxidised nitrogen	X	
Total nitrogen	X	
Total phosphorous	X	
Dissolved reactive phosphorous		X
Total suspended solids		X
Carbonaceous BOD		X
Soluble carbonaceous BOD		X
Faecal coliforms		X
E-coli		X
Turbidity		X
Clarity Tube		X

Details of Permit – Wastewater to land (irrigation)

Purpose for which permit is granted:		To discharge treated wastewater to land via irrigation
Location	- site locality	Crowe Road, Lorneville
	- map reference	E46:490:176
	- catchment	Oreti
Legal description of land at the site:		Lots 32 and 33 Block II DP 64 and Lot 3 DP 10900 and Part Sections 35 and 36 Block XIV Invercargill Hundred
Term:		This consent will expire on XXXX (35 years), or earlier when implementation of the wastewater treament plant upgrade and the application of WAS/SYS solids to land occurs, upon which this consent will be surrendered.

Schedule of Conditions

General Conditions

1. Subject to complying with the conditions of this consent, the activities authorised by this consent shall be undertaken so as to be consistent with the application for this consent and the documents titled:
   (a) Assessment of Environmental Effects dated November 2015
   (b) Technical Reports:
   - Appendix I – Wastewater to Land Annual Monitoring Report

2. This resource consent: authorises the discharge of up to 3,000 m^3/day of treated wastewater (including treated sewage from Wallacetown) from Alliance Group Limited's Lorneville Plant Wastewater Treatment System onto Zone 1 soils as shown on the Map A via spray irrigation using K-Line irrigation methods.

2a. Irrigation Limits. The irrigation of treated wastewater to land shall avoid soils identified as Zone 2 on Map A.

3. The irrigation of treated wastewater onto land shall comply with the following:
   (a) No irrigation or spray-fall is to occur within:
      (i) 100m of any residential dwelling (excluding those owned by the consent holder) except where the owner or occupier of the dwelling has given written approval to the consent holder to use a smaller buffer distance;
      (ii) 50m of any surface watercourse;
      (iii) 20m of any property boundary;
   (b) Only wastewater with a positive dissolved oxygen concentration, and with a sodium adsorption ratio less than 17, shall be discharged onto land.

(c) No irrigation is to occur when the soils are at or above 80% water filled pores as recorded at the Wallacetown- Price Road soil moisture monitoring site as shown on the Environment Southland website.

4. Irrigation of treated wastewater shall comply with the following operational parameters:

(a) The average irrigation rate shall not exceed 5mm per hour, and the depth of application shall not exceed 50mm, to any area in any 24 hour period;

(i) The return period between applications of treated wastewater to an area of land shall not be less than 15 days;

(ii) The annual nitrogen loading rate for wastewater and fertilisers on the area available for irrigation shall not exceed 250kg / hectare.

5. There shall be no surface run off, ponding of an area greater than $50m^2$ 24 hours after being irrigated, or contamination of surface water, resulting from the application of wastewater to pasture.

Monitoring

6. The consent holder shall:

(a) record, in writing or electronically, all activities associated with the wastewater irrigation system including, but not limited to the following:

(i) irrigation blocks sprayed and the return period between successive irrigation events for each block;

(ii) hours of operation on each irrigation block;

(iii) volume discharged to each irrigation block;

(iv) volume discharged per day;

(v) weather conditions, including rainfall and an estimate of wind direction and strength; and

(vi) soil moisture.

(b) record the details of any complaints received about the irrigation of the wastewater, including:

(i) the name and address of the complainant;

(ii) the date and time of the complaint;

(iii) the location of the complaint;

(iv) the weather conditions at the time;

(v) any events in the management of the irrigation system which may have resulted in increased odour emissions; and

(vi) the actions, if any, taken in response to each complaint.

(c) Make the records available for inspection by the consent authority's staff upon request. The cost of such inspections shall be borne by the consent holder.

(d) Advise the consent authority in writing, in the event of a malfunction of an item of plant or equipment which may result in emissions of offensive odour beyond the boundary of the plant, as soon as practicable after the malfunction occurs, followed by a report in writing to the consent authority on the cause of the malfunction and

the action taken, or proposed to be taken, by the consent holder to avoid recurrence of the problem. This report is to be lodged with the consent authority no later than 5 working days from the time of the malfunction.

7. The consent holder shall monitor the discharge by taking representative samples of the wastewater discharge stream:

   (a) Each week while irrigating and analysing those samples for:

      (i) Suspended solids concentration;

      (ii) BOD5 concentration;

      (iii) Ammoniacal nitrogen concentration;

      (iv) Total nitrogen concentration;

      (v) (nitrate + nitrite) nitrogen concentration;

      (vi) Total phosphorous concentration; and

      (vii) E coli concentrations.

   (b) Each month while irrigating and analysing those samples for:

      (i) The cations calcium, sodium and magnesium and the SAR (sodium adsorption ratio) will be calculated.

8. The consent holder shall monitor groundwater in two bores on the site, one of which shall be a control site (upstream of the irrigation area), and the other shall be at the downstream end of the wastewater irrigation area.

   (a) By measuring and recording the depth to groundwater at the two monitoring bores immediately before purging the bores and extracting the samples under condition 8(b);

   (b) By taking representative samples of the groundwater at each site at monthly intervals while irrigating and three monthly for the remainder of the year, and analysing those samples for the following parameters:

      (i) pH;

      (ii) chloride concentration;

      (iii) electrical conductivity;

      (iv) (nitrate + nitrite) nitrogen concentrations;

      (v) Ammoniacal nitrogen concentration;

      (vi) DRP concentrations; and

      (vii) *E.coli* concentrations.

9. In the event that the groundwater monitoring undertaken in accordance with condition 8 show that any two consecutive samples in the downstream bore record a nitrate-nitrogen concentration of greater than 6.9 g/m^3 when that was not exceeded in the upstream control bore, the consent holder shall be required to notify the consent authority and investigate the likely cause of the exceedance. If the investigation determines that the irrigation is likely to have caused or contributed to the exceedance, then the consent holder shall be required to implement appropriate remedial action as recommended by an appropriately qualified and independent person upon receipt and review of the monitoring and investigation results. The results of this investigation and any mitigation or remedial

action undertaken or to be implemented shall be reported to the consent authority within 30 working days of the exceedance being reported.

10. The consent holder shall monitor the effects of the discharge on Bateman's Drain at the point that it exits the irrigation area, or at another point agreed in writing by the consent authority, by taking representative grab samples of water from the drain, at monthly intervals during the period 1 December to 31 May, and analysing those samples for:

    (a) Electrical conductivity;

    (b) Total nitrogen concentration;

    (c) Dissolved reactive phosphorus concentration.

11. For the purpose of monitoring the effects of irrigation of treated wastewater, the consent holder shall:

    (a) Carry out sampling, at a minimum of four irrigated sites within Zone 1 (Edendale/Waikiwi/Woodlands/Mokotua soils) and one non-irrigated control site (i.e. a site on which no effluent is sprayed), in June each year. The samples are to be analysed for:

        (i) Infiltration rate;

        (ii) Hydraulic conductivity.

    (b) Carry out sampling (from the 0-7.5 cm soil depth) of Zone 1 soils in October, January, April and July each year at a minimum of four sites, one of which shall be a non-irrigated control site. The remaining sites shall be irrigated. The samples shall be analysed for:

        (i) pH

        (ii) exchangeable calcium

        (iii) exchangeable magnesium

        (iv) exchangeable potassium

        (v) exchangeable sodium

        (vi) phosphorous

    (c) Estimates of nitrate leaching using lysimeters are to be made monthly at four Zone 1 (Edendale/Waikiwi/Woodlands/Mokotua soils) sites, one of which shall be a non-irrigated control site to assess nitrate losses. Nitrate-N concentrations are to be measured on leachate samples, and estimates are to be made using a daily water balance model for the periods between sampling dates. Nitrate leaching is to be calculated monthly using the Nitrate-N concentrations and drainage data and reported within the company's six monthly reports.

    (d) A soil water balance should be prepared annually for each irrigated block and a non-irrigated block comprising Zone 1 soil.

12. By 30 September each year, the consent holder shall supply to the consent authority an annual monitoring report that assesses the performance of the spray irrigation system. This report shall be prepared by a suitably qualified person and shall include, but not be limited to:

    (a) trends in analytical results;

    (b) results of lysimeter studies;

(c) effects on the soil or groundwater system and any mitigation measures applied to reduce contaminants;

(d) recommendations for improvements in the system;

(e) summary information on return periods and applications of effluent on each block;

(f) estimates of annual nitrogen loading including from fertiliser to each irrigation zone;

(g) water budget, detailing water inputs; rainfall, irrigation volume, and daily estimate of water losses (drainage, evapotranspiration) and daily estimate of soil water contents for each irrigation area and a non-irrigation area.

13. In accordance with condition 12(d) this report shall identify if there is a need to implement additional methods or improvements to be undertaken to the land irrigation system. Within scope of the consent the consent holder shall be required to implement any recommendations in accordance with the requirements set out in the report and apply for any applicable additional resource consent if required. These measures shall be implemented by the consent holder prior to commencing the following irrigation season and included into the Management Plan.

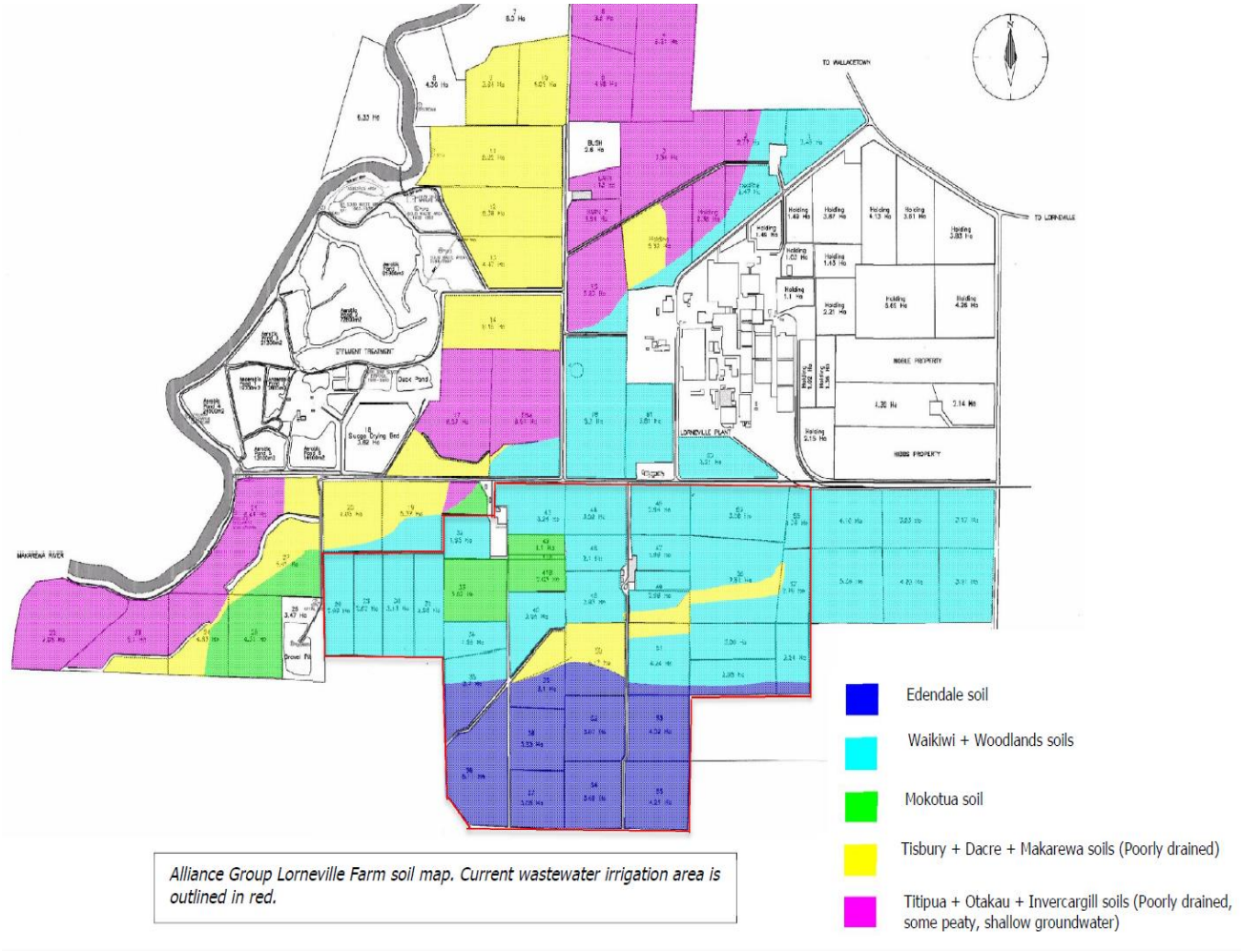
14. For the purpose of this consent, the analyses and preservation of all aqueous samples shall be carried out in accordance with the latest edition of APHA "Standard Methods for the Analysis of Water and Wastewater" or by methods approved by the consent authority.

15. The monitoring and analyses specified in these conditions are to be carried out by a laboratory with IANZ registration or equivalent, or as agreed to in writing by the consent authority.

Review

16. The Consent Authority may, within three months of receiving the report required by condition 13 of this consent, serve notice on the consent holder under section 128 of the Resource Management Act 1991 of its intent to review the conditions of this consent. The purpose of such a review is to assess the significance of any of the groundwater and soil monitoring result which may be causing adverse effects on the receiving environment.

MAP A



Alliance Group Lorneville Farm soil map. Current wastewater irrigation area is outlined in red.

Irrigation is to occur within the red outline area on Zone 1 soils. Zone 2 soils shall not be used for irrigation. Zone 1 soils are those represented in blues and greens. Zone 2 soils are those areas represented in yellow.

Details of Permit – Discharge of BNR Solids from the Wastewater Treatment Plant and Stockyards to Land

Purpose for which permit is granted:		To discharge dewatered BNR solids from the Wastewater Treatment Plant and Stockyards to land where contaminants might enter groundwater.
Location	- site locality	Crowe Road, Lorneville
	- map reference	E46:490:176
	- catchment	Oreti
Legal description of land at the site:		Lots 32 and 33 Block II DP 64 and Lot 3 DP 10900 and Part Sections 35 and 36 Block XIV Invercargill Hundred
Term:		This consent will commence once consent XXX (wastwater irrigation) has been been surrendered by the consent holder and will expire on xxx (35 years)

Schedule of Conditions

General Conditions

1. Subject to complying with the conditions of this consent, the activities authorised by this consent shall be undertaken so as to be consistent with the application for this consent and the documents titled:
   (a) Assessment of Environmental Effects dated November 2015
   (b) Technical Reports:
   - Appendix I – Summary Report on Alternatives and Proposed Upgrading of the Wastewater Treatment Plant
   - Appendix J – Biosolids Land Disposal Assessment
   - Appendix Q – Groundwater and Surface Water Monitoring Report
   - Appendix S – Proposed Contingency Biosolids Monofill

2. This resource consent authorises the land application of dewatered solids on Alliance Group Limited farmland and dewatered BNR solids and dewatered stock yard waste to an onsite monofill at the locations shown on Map A attached to this consent.

   Advice Note:
   For the purposes of this consent the term ***"dewatered solids****" refers to any material originating from the stock yards and the Biological Nutrient Removal Plant (BNR) which is of at least 12% solids content.*

3. Prior to the commencement of this consent the consent holder shall prepare and submit to the consent authority for certification a BNR Solids Management Plan. This shall be generally consistent with the draft BNR Solids Management Plan presented at the hearing, attached to the evidence of Mr Khan. The purpose of this plan shall be to describe the

operational management associated with the disposal of dewatered solids and the application of other nutrients to land. It shall also describe the operational management methods to be applied to the disposal of dewatered Solids to an onsite monofill, if such a facility is deemed by the consent holder to be necessary. The objective of this plan shall be to ensure that the actual and potential adverse effects arising from the disposal of dewatered solids and the application of other nutrients to land and to an onsite monofill are appropriately avoided, remedied or mitigated. The BNR Solids Management Plan shall include but not be limited to:

(a) Description of the likely generation and volume of dewatered solids from the wastewater treatment plant and the stock yards;

(b) Details of the land application methodology, including details of phosphorus, metals and nitrogen loads to be applied to land as a result of land application of dewatered solids on a per hectare per annum basis including an assessment of nitrogen loading from any fertiliser sources;

(c) Managerial procedures and physical methods to be implemented to avoid, remedy or mitigate adverse effects on the receiving environment including the management of odour;

(d) Stock withholding periods and other management matters to fit in with the farming activities;

(e) A description of any required onsite monofill including but not limited to:
    (i) Details of each monofill cell, its location and capacity;
    (ii) Methods for recording and reporting dewatered solids deposition rate and annual loads to the monofill;
    (iii) Methods for measuring and reporting dewatered solids characteristics;
    (iv) Methods for managing leachate;
    (v) Methods for the management of any potential odour and vector attraction issues.

If the BNR Solids Management Plan is changed or updated to reflect a change in operational practices, a copy of the revised plan shall be submitted to the consent authority within one month of the change or update being made.

4. The consent holder shall ensure that the disposal and management of dewatered solids is undertaken in accordance with the BNR Solids Management Plan.

<u>Disposal of Dewatered Solids to Farm Land</u>

5. BNR Solids and the application of other nitrogen sources applied to the areas of farmland shown on Map A, shall not exceed an annual loading rate of any greater than the plant available nitrogen (PAN) rate of 140kg N/ha/yr or 250kg Total N/ha/yr.

6. No spreading of dewatered solids onto land shall occur within:
    (a) 100m of any residential dwelling (excluding those owned by the consent holder);
    (b) 50m of any surface watercourse;
    (c) 20m of any property boundary.

7. The consent holder shall ensure that there is no direct discharge or runoff of dewatered solids to any open water courses.

8. The consent holder shall ensure that the dewatered solids are applied to land as evenly as possible and shall be undertaken using specialised spreading equipment.

9. The dewatered solids shall not be applied to land if:
   (a) There has been a weather forecast predicting 20mm or more of rainfall within the subsequent 24 hours, and/or
   (b) There has been a rainfall event of 20 mm or more, within 24 hours of the planned application.

9a. A stock withholding period of 14 days for grazed pasture or stock food cropped areas shall apply following the application of any Dewatered solids to land.

Monofill

10. The consent holder shall discharge dewatered solids to an onsite monofill only in accordance with the requirements set within the BNR Solids Management Plan prepared in accordance with condition 3. The monofill shall be used as a contingency disposal site available to receive dewatered solids from the stockyards and dewatered solids from the Wastewater Treatment Plant when one or more of the following events (or similar) arise:
   (a) When the land is unsuitable to receive the dewatered solids as determined by condition 9 above and with an additional allowance for the drying of the land of 1-2 days as necessary;
   (b) The requirement of the consent holder to accept stock from its suppliers in the event there is an increase in the destocking rates by those supplier farmers, usually as a result of drought;
   (c) The use of the machinery required to discharge dewatered solids will result in land damage within the discharge area;
   (d) Non acceptance of the stockyard solids at an offsite composting facility; or
   (e) Breakdown of the machinery associated with the land spreading of the stockyards waste and BNR solids.

11. The consent holder shall ensure that the monofill only receives dewatered solids produced at the site from the stockyards and BNR solids from the Wastewater Treatment Plant.

12. The consent holder shall ensure that once each monofill cell has reached capacity, it is rehabilitated including with the use of a capping of a 0.3m thick clay/soil layer, or such other capping as may be agreed with the consent authority in writing.

Monitoring

13. The consent holder shall keep records of the following:
   (a) The date of each application of dewatered solids;
   (b) The daily location of the biosolids disposal area, and the size of the land area in hectares;
   (c) The weight of dewatered solids applied;

(d) Results of composite sampling and analysis of the dry solids content of the dewatered solids undertaken on a fortnightly basis;

(e) Document contingency actions undertaken when dewatered solids could not be discharged to land, including the use, volume and rate of discharge to onsite monofill cells.

14. At all times when dewatered solids are being applied to land, a representative sample of the applied material shall be taken monthly and analysed for:

(a) Total solids;

(b) Total nitrogen;

(c) Total ammoniacal nitrogen;

(d) Total oxidised nitrogen;

(e) Total phosphorus;

(f) Total potassium;

(g) Total calcium;

(h) Total magnesium; and

(i) Total sodium.

Once per year a dewatered solids sample collected as above shall be analysed for the following in addition to those parameters above:

(a) Total copper;

(b) Total lead;

(c) Total zinc;

(d) Total nickel;

(e) Total sulphur.

15. For the purpose of monitoring the effects of dewatered solids applications the consent holder shall:

(a) Carry out assessments of the soils within the application areas, in June each year, at a minimum of four sites, one of which shall be a control site, i.e. a site on which application of dewatered solids does not occur. The remaining monitoring sites shall be in areas where dewatered solids application has occurred in the previous year. The assessments are to include infiltration rate, soil structure (0-20 cm soil depth), and soil aeration status (0-20 cm soil depth).

(b) Carry out sampling (from the 0-7.5cm soil depth) of the soils in December and June each year at a minimum of three sites, one of which shall be a control site where dewatered solids application does not occur. The remaining monitoring sites shall be in areas where dewatered solids application has occurred in the previous year. The samples shall be analysed for:

(i) pH;

(ii) exchangeable calcium;

(iii) exchangeable magnesium;

(iv) exchangeable potassium;
(v) exchangeable sodium;
(vi) Total Phosphorous;
(vii) Total organic carbon;
(viii) Total nitrogen;
(ix) Anaerobically mineralisable nitrogen;
(x) Nitrate nitrogen.

(c) Estimates of nitrate leaching using lysimeters are to be made monthly, at eight sites throughout the application area, to assess nitrate losses. Nitrate-N concentrations are to be measured on leachate samples, and estimates are to be made using a daily water balance model for the periods between sampling dates. Nitrate leaching is to be calculated monthly using the Nitrate-N concentrations and drainage data and reported as part of the annual monitoring report prepared in accordance with condition 22.

16. The consent holder shall monitor the effects of the discharge on Bateman's Drain at the point that it exits the dewatered solids application area, or at another point agreed in writing by the consent authority, by taking representative grab samples of water from the drain, at monthly intervals, and analysing those samples for:

(a) Electrical conductivity;

(b) Total nitrogen concentration;

(c) Dissolved reactive phosphorus concentration.

17. The consent holder shall monitor groundwater in two bores on the site, one of which shall be a control site (upstream of the dewatered solids application area), and the other shall be at the downstream end of the dewatered solids application area located at about map reference NZMS XXXX:

(a) By measuring and recording the depth to groundwater at the two on-site monitoring bores immediately before purging the bores and extracting the samples under condition 17(b);

(b) By taking representative samples of the groundwater at each site at three monthly intervals, and analysing those samples for the following parameters:

(i) pH;
(ii) chloride concentration;
(iii) electrical conductivity;
(iv) nitrate + nitrite nitrogen concentrations;
(v) Ammoniacal nitrogen concentration;
(vi) E coli concentrations.

18. In the event that the groundwater monitoring undertaken in accordance with condition 17 show that any two consecutive samples in the downstream bore record a nitrate-nitrogen concentration of greater than 6.9 g/m^3 when that was not exceeded in the upstream control bore the consent holder shall be required to notify the consent authority and investigate the likely cause of the exceedance. If the investigation determines that the discharge is likely to have caused or contributed to the exceedance, then the consent

holder shall be required to outline and implement appropriate remedial action. The results of this investigation and any mitigation or remedial action undertaken or to be implemented shall be reported to the consent authority within 30 working days of the exceedance being reported.

19. In order to determine the volume of dewatered solids within the monofill cells, the consent holder shall record the number of truck and disposal movements to each monofill cell. Periodic weight per volume validations of waste shall also be undertaken and this shall be reported to the consent authority as part of the annual monitoring report prepared in accordance with condition 21.

20. Once each monofill cell has reached capacity, it shall be capped in accordance with condition 12. Once the cell has been decommissioned for a period of three years a final capping survey shall be undertaken to ensure that land contouring is undertaken over the surface to avoid any seepage of rain into the monofill. The results of this survey shall be provided to the consent authority within 20 working days of the survey being completed and outcomes included as part of the monitoring report prepared in accordance with condition 21.

Reporting

21. By the 15 December each year of operation, the consent holder shall prepare a monitoring report relating to the activities authorised by this consent over the preceding 1 October to 30 September period. This report shall be submitted to consent authority. The monitoring report shall include but not be limited to:

    (a) Detailed assessment of the nitrogen loading rates and an assessment of compliance with condition 5 of this consent;

    (b) Summation and discussion of all data collected as required under the conditions of this consent as relating to both disposal of dewatered solids to land and to monofill;

    (c) Description of the effects on soil and groundwater resources arising from the application of dewatered solids, any breaches of the trigger identified in condition 18 and the mitigation measures undertaken;

    (d) Report and discuss any complaints received regarding the application of dewatered solids;

    (e) Critically evaluate the performance of any managerial procedures and physical mechanisms in place to avoid, remedy or mitigate adverse effects on the environment, identify any improvements undertaken and make recommendations on any additional improvements needed;

    (f) After any monofill cell has been decommissioned for a period of three years, the monitoring report shall include a description of the contour and stability of the cover, an assessment of any on-going effects and any recommendations for further remediation.

22. The report prepared in accordance with condition 21 shall identify if there is a need to implement additional measures or improvements to be undertaken with the system that is used to spread the dewatered solids to land. Within scope of this consent the consent holder shall be required to implement any recommendations in accordance with the requirements set out in the report. These measures shall be implemented by the consent holder within three months of receiving the report.

Review

23. The consent authority may, within three months of receiving the report required by condition 21 of this consent, serve notice on the consent holder under section 128 of the Resource Management Act 1991 of its intent to review the conditions of this consent. The purpose of such a review is to deal with any adverse effect on the environment which may arise from the exercise of this consent; and/or requiring the adoption of the best practicable option to remove or reduce any adverse effect on the environment.

Details of Permit – Contaminants to Air

Purpose for which permit is granted:		To discharge contaminants to air for the purpose of operating a meat processing and export plant and associated activities and all other on-site activities including the disposal of waste.
Location	- site locality	Lorneville
	- map reference	E46:476:182
Term:		This consent will expire on (35 years from date of grant)

Schedule of Conditions

General Conditions

1. Subject to complying with the conditions of this consent, the activities authorised by this consent shall be undertaken so as to be consistent with the application for this consent and the documents entitled:
   (a) Assessment of Environmental Effects dated November 2015
   (b) Technical Reports:
   - Appendix E - Background Ambient Air Quality Report – Golder Associates
   - Appendix F – Baseline Odour Survey – Golder Associates
   - Appendix G – Process Odour Mitigation – Golder Associates
   - Appendix M – Coal Fired Boiler Assessment – Golder Associates
   - Appendix R – Wastewater Treatment Odour Mitigation – Golder Associates
   - Appendix U – Draft Air Quality Discharge Management Plan

2. Any incident causing abnormal and/or excessive emissions to the atmosphere, including odour, shall be abated as soon as is reasonably practicable. On becoming aware of such an incident, the consent holder shall immediately advise the consent authority and follow-up with a written report on the cause, and the actions taken to prevent a recurrence.

3. Trade wastes may be burnt in the existing concrete lined area designated for this purpose. The wastes to be burned shall be limited to wood or paper waste and shall specifically exclude CAA treated timber and painted timber. There shall be no other open air burning of trade waste on the premises.

4. Prior to the commencement of this consent, the consent holder shall prepare and submit to the consent authority an Air Discharge Management Plan. The purpose of the Air Discharge Management Plan shall be to ensure that any adverse effects from the air discharges authorised by this consent are avoided, remedied or mitigated and that the discharges are appropriately monitored for compliance purposes. The Air Discharge Management Plan shall contain, but not be limited to:

(a) A description of the air discharges arising from onsite activities and processes including:

(i) Boiler operations and emissions requirements;

(ii) Rendering plant operating requirements;

(iii) Odour management;

(iv) Methods to manage the effects of the air discharges including particulate emissions and odours and to assist with giving effect to the review obligations set out in condition 17.

(b) Monitoring and reporting requirements.

If the Air Discharge Management Plan is changed or updated, a copy of the revised plan shall be submitted to the consent authority within one month of the change or update being made.

Boiler Operating and Emission Requirements

5. The height of the stacks above surrounding ground level shall not be less than:

(a) 30.9m for the Babcock and Wilcox boiler;

(b) 34.1m for the Foster-Wheeler boiler.

6. The sulphur content of fuel used for the boilers shall not exceed 0.5 wt% (as-received), based on the results of the following testing:

(i) A grab sample of the supplied coal for the boilers shall be collected at least once per week and sent to an IANZ accredited laboratory for analysis for combustible sulfur as percent by weight of coal both on an as-received and dry basis.

(ii) If the coal source changes then a representative analysis of the sulfur content shall be carried out to confirm compliance with the 0.5 wt% limit before the new coal source is accepted.

(iii) The preparation of a monthly monitoring report which shall summarise grab sample test results including a comparison with the limit specified in this condition. A copy of this report shall be submitted to the consent authority each month upon completion.

7. The discharge from the boiler stacks shall be directed vertically into the air and shall not be impeded by any obstruction that could impede the vertical efflux velocity.

8. The opacity of smoke discharged from any boiler shall not exceed Ringelmann Shade 1 as described in New Zealand Standard 5201:1973 except:

(a) for 60 minutes when lighting a boiler after a shutdown period of up to eight hours; or

(b) for four hours when lighting a boiler after a shutdown period of longer than eight hours; and

(c) at any other time, to allow for cleaning the fires and manual soot blowing of the boilers, for periods not exceeding two minutes at a time and not exceeding five minutes in any period of 60 minutes.

9. The consent holder shall install industry standard opacity meters within the boiler discharge stacks, using either light extinction or light scattering based technologies. The system shall be installed within 8 months of the commencement of this consent and enable percentage opacity of the two boilers exhaust to be recorded and displayed to boiler operator staff.

10. The storage of coal and ash shall be managed so that there is no visible emission of coal and ash dust beyond the boundary of the site.

11. The coal fired boiler(s) used on the site shall be serviced at least once every year and the servicing shall be supervised by a person competent in servicing of such boilers. This servicing shall include:

    (a) Internal cleaning and replacement or repair of damaged equipment and services as necessary;

    (b) Adjustment of the air to fuel ratio to optimise energy efficiency and to minimise the emission of products of incomplete combustion; and

    (c) Calibration and adjustment of boiler monitoring equipment consistent with the monitoring obligations of this consent.

    Servicing reports shall be prepared following each servicing event. Confirmation that this servicing has been undertaken, and a copy of the servicing report shall be supplied to the consent authority by 30 November each year.

12. (a) The exhaust air from the two coal fired boilers shall have a flow weighted PM_{10} concentration of 300 mg/m^3 at standard atmospheric pressure and temperature, (STP) corrected to 12 vol.% CO_2 and dry, which equates to a maximum PM_{10} mass rate of 21.4kg/hr .

    (b) By no later than five years from the first exercise of this consent, and thereafter the flow weighted PM_{10} concentration from the two coal fired boilers shall not exceed 250 mg/m^3 at STP corrected to 12 vol.% CO_2 and dry, which equates to a maximum PM_{10} mass rate of 17.8kg/hr.

13. The consent holder shall undertake continuous monitoring and logging of ambient 1-hour and 24-hourly average respirable particulate (PM_{10} and $PM_{2.5}$) concentrations in conjunction with wind speed and direction. The monitoring location shall be as close as practical to New Zealand Transverse Mercator coordinates (NZTM) 1240.240, 4856.670 (Eastings and Northings in kilometres (km)) being a site nearby the dwelling at 237 Steel Road. The monitoring campaign shall commence either before or by 1 December after the commencement of this consent and operate all year round.

    Specific features of the methodology shall include:

    (a) The ambient PM_{10} and $PM_{2.5}$ monitoring shall be by Beta Attenuation Monitor (BAM) in accordance with AS/NZ 3580.9.11:2008 'Determination of suspended particulate matter - PM_{10} beta attenuation monitors' or equivalent semi-continuous method. The sampling height shall be 3 metres above ground level.

    (b) Concurrent monitoring of wind speed and direction at the monitoring site and logging of 10 minute and hourly averaged data at the same site as the ambient monitoring. Wind speed and direction shall be monitored using industry standard meteorological monitoring instrumentation that is attached to a mast at a height of 6

metres above ground level. Specifically the wind direction and speed monitoring equipment shall meet the following specifications:

Wind Speed Instrumentation:
Range: 0 to ≥ 30m/s
Accuracy: ≤ ±5% @ 3 m/s
Resolution: ≤ 0.1 m/s
Response Time: ≤ 1 second
Wind Speed Threshold: ≤ 0.5 m/s

Wind Direction Instrumentation:
Range: 0-359º
Accuracy: ≤ ±5% @ 3 m/s
Resolution: 1º
Response Time: ≤ 1 second
Wind Speed Threshold: ≤ 0.5 m/s

(c) Ambient PM_{10} and $PM_{2.5}$ concentrations in micrograms per cubic metre shall be recorded in electronic form as 1-hour and 24-hour averages (midnight to midnight). Wind speed in metres per second, and wind direction in degrees clockwise of true north, shall be recorded in electronic form as 1-hour and 10 minute averages.

(d) The consent holder shall report the hourly PM_{10} and $PM_{2.5}$ concentration measurements that occur when the monitoring site is downwind of the boiler stacks. This includes 1-hour average wind directions that are between 245 and 270 degrees from true north (or whichever directions are within 13 degrees of the direction bearing between the monitor sample point and the boiler stacks). The consent holder shall also report all 24-hour PM_{10} concentration measurements.

(e) From the downwind ambient 1-hour PM_{10} results, the consent holder shall report the maximum, 95th and 50th percentile values (ie. X, Y, Z indicated in Table 1, respectively). The maximum and 95th percentiles (X & Y) shall meet their respective PM_{10} concentration percentile limits listed in Table 1. These are appropriate limits that relate to the applicable coal-fired boiler stack PM_{10} discharge limits of 300 mg/m^3 and 250 mg/m^3 (at 12 vol.% CO2 and dry STP condition). The applicable stack discharge limit for PM_{10} is defined in condition 12.

TABLE 1: AMBIENT PM_{10} PERCENTILE LIMITS FOR OFF-SITE MONITORING

Hourly Downwind PM_{10} Percentile	**Monitored hourly PM_{10} (µg/m^3), downwind conditions**	**Expected Ambient PM_{10} (µg/m^3) for stack concentration of 300 mg/m^3**	**Expected Ambient PM_{10} (µg/m^3) for stack concentration of 250 mg/m^3**
100%	x	**122**	**117**
95%	y	**37**	**35**
50%	z	**18**	**17**

14. Should the monitoring and reporting of hourly downwind ambient PM_{10} percentiles undertaken in accordance with condition 14 identify that either of the appropriate 95th and/or the 100th percentile PM_{10} limits listed in Table 1 of condition 13(e), are exceeded by 2 µg/m^3, or more, then testing of PM_{10} discharges from the boiler stacks using US EPA

Methods 201A and 202 (or equivalent methods agreed with the consent authority) shall be undertaken no later than two months post the exceedance.

15. The results of the stack testing and completed ambient monitoring for the concurrent period undertaken in accordance with condition 14 shall be reported to Southland Regional Council within 30 working days of its completion. If the monitoring determines that the operation of the boilers is likely to have caused or contributed to an exceedance of the ambient limits set out in condition 13(e) this report shall also identify the likely cause and remedial actions that are necessary to be undertaken in order to prevent such exceedances occurring again, and the appropriate timeframe for implementation. The Southland Regional Council may, at the consent holder's expense, engage a suitably qualified person to review the report and shall subsequently confirm in writing the necessary remedial actions and the timeframe for those actions. The consent holder shall implement the required action specified in writing by the Southland Regional Council in accordance with the specified timeframes.

16. By 31 January each year, the consent holder shall provide a monitoring report to the consent authority that summarises the monitoring results for the 12 month period ending on 30 November of the previous year, which shall include the following:

    (a) Electronic data set containing the time series of monitored hourly PM_{10} and $PM_{2.5}$, wind speed and wind direction;

    (b) Table containing the monitored results versus PM_{10} percentiles;

    (c) Time series plot of monitored 24-hour average PM_{10} and comparison with a trigger value of 45 ug/m^3 and the NES criterion for 24-hour PM_{10};

    (d) Results of any stack discharge testing carried out in response to either the 95^{th} and/or the 100^{th} PM_{10} concentration percentile limits being exceeded as described in condition 13(e).

17. Within ten years of the commencement of this consent and at five yearly intervals thereafter, the consent holder shall conduct a review of:

    (a) The results of the monitoring required by the conditions of this consent;

    (b) Relevant guidelines or standards for discharges to air applicable at the date of the review; and

    (c) Available technology for the control of emissions to air from the discharge sources at the site.

    (d) The current and relevant health related science to confirm the best practicable option (as defined in section 2 RMA) for the control of emissions to air from the discharge sources at the site.

17a. This review shall require the consent holder to identify if there is a need to implement additional methods for controlling the effects of the emissions at the site to ensure adherence to best practicable option obligations. The review shall detail any additional emissions control technology that is necessary, a programme of procurement and implementation associated with any required additional emissions control technology and the predicted emissions reduction that is likely to accrue from the implementation of this technology.

17b. A report detailing the review shall be provided to a suitably qualified, independent air quality expert for verification that the review has been undertaken in accordance with

achieving the best practicable option for controlling emissions. The results of the review, and the advice received from the independent air quality expert shall be reported to the consent authority immediately upon completion of the review. The consent holder's obligations to undertake this review and the associated reporting process shall be completed not more than three months after being initiated.

17c. The consent authority shall be required to be satisfied that the review has properly assessed the best practicable option for providing ongoing emissions control at the site and that any programme of procurement and implementation associated with any required technological upgrades is robust. The consent authority shall certify the review report once it is satisfied that the requirements of this condition have been met.

17d. The consent holder shall be required to implement any suggested emissions control measures in accordance with the procurement and implementation programme. Within three months of commissioning any required emissions control measures the consent holder shall provide a report to the consent authority that confirms that the work has been completed and which details future monitoring requirements and expected emissions performance standards. The consent holder shall meet these monitoring requirements and emissions performance standards for the remainder of the term of this consent.

Rendering Plant Operating Requirements

18. Other than slink carcases or dead stock seasonally in the spring (fallen stock), only fresh or suitably stabilised material shall be processed in the rendering plant. This includes material from offsite sources. Slink carcases or fallen stock shall be processed as soon as practicable after arrival at Lorneville Plant.

Note:

For the purposes of condition 18: 1) "Fresh" means; for material derived from the slaughter and dressing of stock, no older than 24 hours from the time of slaughter; for chilled or frozen materials derived from the cutting, boning, or further processing operations, no older than 24 hours from the time of delivery to the rendering department.2) "Stabilised" means stabilised by a recognised method which may include acid stabilisation or the use of proprietary stabilisation agents applied at manufacturer's recommended dose. Stabilisation should occur as soon as is practicable but shall be no later than 8 hours from the time of slaughter or 8 hours from the removal of the animal carcase from a chilled facility.

19. Material shall not be left in an uncooked or partially cooked condition overnight in the rendering processing line.

20. No blood older than 48 hours is to be processed.

21. The consent holder shall ensure that an odour control system is installed and functional with respect to the rendering plant activities at all times. The odour control system shall be operated according to an assigned set of protocols which set out:

(a) A description of the odour extraction, cooling and biofilter systems;

(b) A description of the operating parameters, the target values, methods and frequency and location of odour control systems;

(c) Performance monitoring procedures for the odour control systems including daily, weekly, monthly and annual observations and monitoring that is required;

(d) Methods for managing the biofilter which includes operational parameters and monitoring obligations.

22. The protocols for managing the biofilter prepared in accordance with condition 21(d) shall ensure that the biofilter associated with the rendering plant is operated and maintained to an appropriate standard to minimise odour effects. The following parameters shall be monitored at the frequencies specified below:

(a) Daily visual observations of the state of the biofilter bed, particular for short circuiting and clogging of the bed;

(b) Continuous monitoring of the inlet temperature;

(c) Weekly monitoring of pressure drop across the biofilter bed;

(d) Monthly monitoring of biofilter bed moisture content;

(e) Monthly monitoring of biofilter bed pH.

23. The inlet gas temperature to the biofilter shall be maintained at less than 40°C at least 99% of the time.

24. Floors, conveyors, and other equipment shall be kept free of accumulations of raw material which may putrefy and generate odours.

25. The consent holder shall have in place a contingency plan of actions that will be implemented in the event that the rendering plant is inoperative due to equipment failure. A copy of this contingency plan shall be provided to the consent authority prior to the first exercise of this consent. If the contingency plan is changed or updated to reflect a change in operational practices a copy of the revised plan shall be submitted to the consent authority within one month of the change or update being made.

<u>Odour Management</u>

26. The consent holder shall ensure that its activities, including the rendering plant and wastewater treatment facility, are operated in such a way as to ensure that there are no odour discharges to air that are noxious, dangerous, offensive or objectionable to the extent that it causes an adverse effect at or beyond the boundary of the site in the opinion of an officer of the consent authority.

27. Following any non-compliance with condition 26 being identified, the consent holder shall immediately advise the consent authority and follow-up with an investigation of the likely source of the odour and shall as soon as practicable prepare a report identifying the source and the methods to be implemented to reduce or properly manage the odour. The report shall be submitted to the consent authority. The methods set out within the report shall be implemented by the consent holder.

28. The consent holder shall keep a log of all odour complaints, which shall include:

(a) The location where the odour was detected by the complainant;

(b) The date and time when the odour was detected;

(c) A description of the odour character, intensity and duration of exposure;

(d) The most likely cause of the odour detected;

(e) Note if there were any abnormal activities at or discharges from the Plant that may have resulted in the complaint;

(f) Weather conditions at the time of the complaint.

This log shall be provided to the consent authority upon request.

29. Within five years of the commencement of this consent and as required by condition 12 of consent XXX (discharge of treated wastewater to water), the consent holder shall prepare and submit to the consent authority a Wastewater Treatment Upgrade Plan. This Plan shall address measures to manage odour from the wastewater treatment upgrade, including the proposed disposal of dewatered biosolids. The objective of this part of the plan shall be to ensure that any adverse effects on sensitive receptors arising from discharges from the existing wastewater treatment plant and the upgraded wastewater treatment plant are appropriately avoided, remedied or mitigated. This part of the plan shall:

(i) Identify appropriate methods that will be undertaken as part of the overall plant upgrade in order to reduce fugitive odour emissions from the existing wastewater treatment system. This shall include but not be limited to the oxidation of sulphides within the waste lime wash liquors.

(ii) Identify appropriate methods that will be undertaken as part of the overall plant upgrade in order to manage and minimise fugitive odour emissions from the upgraded treatment plant. This shall include but not be limited to:

a. A description of the potential sources of odour associated with the wastewater treatment plant upgrade;

b. Methods to manage or minimise odours arising from the wastewater treatment plant upgrade including the storage and application of biosolids and design and management of the monofill sites;

c. Ongoing monitoring of the wastewater treatment upgrade with respect to potential odour sources and reporting requirements.

30. The consent holder shall be required to implement the measures contained within the Wastewater Treatment Upgrade Plan.

31. Once the upgraded wastewater system has been commissioned in accordance with consent XXX, and has been fully operational for twelve months, the consent holder shall be required to undertake a review of the effectiveness of the relevant odour measures and methods contained within the Wastewater Treatment Upgrade Plan and provide a report to the consent authority. Should the report identify that any changes are necessary these shall be implemented in agreement with consent authority within three months following receipt of the report.

32. The consent holder shall ensure that any new anaerobic lagoon(s) required as part of the Wastewater Treatment Upgrade Plan are to be constructed with a synthetic cover that is designed to allow for the collection and storage of biogas. The Consent Holder shall ensure that biogases emitted from the anaerobic lagoon are thermally combusted at all times except under the following circumstances:

(a) in the event of a combustion equipment failure; or

(b) for combustion equipment maintenance purposes; or

(c) when adverse weather conditions prevent safe combustion equipment operation.

Where biogases are not thermally combusted then they shall be vented to a biofilter.

Review

33. The consent authority may, in accordance with sections 128 and 129 of the Resource Management Act 1991, serve notice on the consent holder of its intention to review the conditions of this consent during the period 1 February to 30 September each year, or within two months of any enforcement action being taken by the consent authority in relation to the exercise of this consent, or on receiving monitoring results, for the purposes of:

    (a) determining whether the conditions of this permit are adequate to deal with any adverse effects on the environment; or

    (b) ensuring the conditions of this consent are consistent with any National Environmental Standards Regulations, relevant plans and /or the Southland Regional Policy Statement; or

    (c) amending the monitoring programme to be undertaken; or

    (d) adding or adjusting compliance limits; or

    (e) requiring the consent holder to adopt the best practicable option to remove or reduce any adverse effects.

    (f) requiring ambient monitoring of sulphur dioxide for a period of at least one year in the event that there is a change to any national environmental standard (NES) or ambient air quality guideline set by the New Zealand Government or the Southland Regional Council that sets a guideline or standard for sulphur dioxide of less than or equal to $50\mu g/m^3$ (24 hour average); or

    (g) requiring measures to reduce sulphur dioxide emissions from the coal fired boiler plant to a level that is predicted to comply with the standard or air quality guideline described in condition 33(f).

Details of Permit – Water Take

Purpose for which permit is granted: To take surface water for a meat processing operation

Location	- site locality	Lorneville
	- map reference	E46:458-204
	- catchment	Oreti

Legal description of land at the site: Sec 93 Blk XVI New River Hundred and Lot 1 DP 8017

Term: This consent will commence once consent 203358 has been surrendered by the consent holder and will expire on xx (35 years).

Schedule of Conditions

1. This consent authorises abstraction of up to 22,500 cubic metres of water per day at a maximum rate of 260 litres per second from the Oreti River, at or about the location specified within the map reference above.

2. (a) Prior to the exercise of this consent, the consent holder shall install a water meter to record the water take, within an error accuracy range of +/-5% over the meter's nominal flow range, a datalogger with at least 24 months data storage capacity and a telemetry unit to record the rate and volume of take, and the date and time this water was taken. The consent holder shall forward a copy of the installation certificate to the Consent Authority within one month of installing the water meter and datalogger.

   (b) The water meter shall be installed in a straight length of pipe, before any diversion of water occurs. The straight length of pipe shall be part of the pump outlet plumbing, easily accessible, have no fittings and obstructions in it. There shall be a straight length of pipe on either side of the water meter, on the upstream side there shall be a distance that is 10 times the diameter of the pipe and on the downstream side there shall be a distance of 5 times the diameter of the pipe.

   (c) The consent holder shall ensure the full operation of the water meter and datalogger at all times during the exercise of this consent. All malfunctions of the water meter and/or datalogger during the exercise of this consent shall be reported to the Consent Authority within five working days of observation and appropriate repairs shall be performed within five working days. Once the malfunction has been remedied, a Water Measuring Device Verification Form completed with photographic evidence must be submitted to the Consent Authority within five working days of the completion of repairs.

   (d) (i) If a mechanical insert water meter is installed it shall be verified for accuracy each and every year from the exercise of this consent.

   (ii) Any electromagnetic or ultrasonic flow meter shall be verified for accuracy every five years from the exercise of this consent.

(iii) Each verification shall be undertaken by a Consent Authority approved operator and a Water Measuring Device Verification Form shall be completed and supplied to the Consent Authority with receipts of service. These shall be supplied within five working days of the verification, and at any time upon request.

(e) The consent holder shall record adequate data to demonstrate compliance with Condition 1. Data from the datalogger shall be provided once daily to the Consent Authority by means of telemetry. The consent holder shall ensure data is compatible with the Consent Authority's time-series database.

3. The consent holder shall implement, as necessary, the measures detailed in its *Low Flow Contingency Plan for Abstraction from the Oreti River*. In accordance with this plan the following shall apply:

Oreti River Trigger Levels	**Conservation Measures**
4.2m^3/sec	i. Notify all plant personnel of low flow conditions and the need to reduce water use. ii. Cease supplementary supply of potable water to Wallacetown iii. Commission an independent audit to identify specific water conservation measures iv. Establish a Water Conservation Task Force to implement water conservation measures including those identified by the water use audit v. Redirect stock and / or redirect further processing to other Alliance plants if practicable vi. Participate in Environment Southland drought response measures including daily reporting on achievements in water
3.3m^3/sec	i. Adopt the measures that apply at 4.2 m3/sec listed above ii. Redirect partially processed products to other Alliance plants or independent processors where this will reduce water use. iii. Reduce water use in conveyance of products between departments

4. For no longer than the first five years of this consent the consent holder shall maintain a fish screen on the abstraction intake which shall comprise of two fish screens, one a 50mm x 13mm galvanised bar screen at 40mm centres, for screening of large debris, and the second a screen with 12mm diameter holes at 18mm centres.

5. Prior to the fifth anniversary of the commencement of this consent, the consent holder shall be required to upgrade the second fish screen referred to in condition 4, as follows:

(a) The consent holder shall install, operate and maintain the fish screen in accordance with the NIWA publication "*Fish Screening: Good Practice Guidelines for Canterbury, October 2007*", NIWA Client Report CHC2007R092.

(b) The fish screen shall have a maximum cross-sectional approach velocity of no greater than 0.12 metres per second.

(c) The intake shall be operated to ensure that fish are not impinged against the fish screen and are able to swim away back to the Makarewa River.

(d) In the event that the fish screen is damaged so as to be rendered less effective at excluding fish from the intake, the consent holder shall repair or replace the fish screen as soon as practicable, or shall shut down the fish diversion barrier such that water ceases to pass through it.

(e) The consent holder shall within 12 months of the fish screen installation undertake monitoring to assess compliance with clause 5(b). If it is found that fish are being impinged due to approach velocity, the necessary adjustments will be made to ensure full compliance with clauses 5(a), 5(b) and 5(c).

6. The consent holder shall pay an annual administration charge to the consent authority, collected in accordance with Section 36 if the Resource Management Act, payable in advance on the first day of July each year.

7. The consent authority may serve notice of its intention to review the conditions of this consent, in accordance with the conditions of this resource consent and Sections 128 and 129 of the Resource Management Act 1991, during the period March to July each year for the purposes of:

   (a) requiring the monitoring of the rate of, and/or the effect of the abstraction;

   (b) requiring efficiency of water use;

   (c) addressing the effects of the abstraction of the river and/or estuary;

   (d) complying with the requirements of a regional plan.

Details of Permit – Land Use Consent

Purpose for which permit is granted:	To disturb the bed of a river during sediment removal and general maintenance of an intake channel
Location - site locality	Kirkbride Street, Wallacetown
- map reference	E46:458:204
- catchment	Oreti
Legal description of land at the site:	Section 93 Block XVI New River Hundred and Lot 1 DP 8017
Term:	This consent will commence once consent 201227 has been surrendered by the consent holder and will expire on xx (35 years).

Schedule of Conditions

1. This consent authorises the following activities associated with maintaining a water abstraction intake channel at the location specified above:

   (a) removal of riverbed sediments at the mouth of the intake channel;

   (b) taking water associated with sediment removal;

   (c) discharge of contaminants (sediment and associated water) into water;

   (d) discharge of contaminants (sediments and associated water) onto the nearby riverbank in circumstances which may result in those contaminants entering water; and

   (e) temporary discoloration of the river due to sediments released during the disturbance of the riverbed authorised by this resource consent.

2. Sediments may be removed from the bed of the Oreti River to a horizontal distance of 5metres from the mouth of the intake channel.

3. The consent holder shall notify the consent authority at least five working days prior to commencing maintenance of the channel on each occasion.

4. The consent holder shall schedule planned maintenance work to occur on an annual basis, outside the period 1 October to 31 August. This does not apply to channel maintenance work that might be necessary to clear material and debris following flood events or other emergency work that might be required.

5. In undertaking the channel maintenance works the consent holder shall:

   (a) Keep the affected working area to a practicable minimum and ensure that all plant and machinery working in the river is in good working order and is cleaned so as to be free of weeds or other pest plants prior to entering the water.

(b) Ensure that any reinstatement of works after floods are, as far as is practicable undertaken during the recession of the flood, while the river flow is still naturally turbid.

(c) Ensure that all disturbed vegetation, soil or other material is deposited, stockpiled or contained to prevent the movement of the material so that it does not result in:

i. The diversion, damming or blockage of any river or stream;

ii. The passage of fish to the main stem of the Oreti River being impeded, or fish or eel stranding within the channel or on the riverbanks;

iii. The destruction of any significant habitat in a waterbody;

iv. Flooding or erosion.

(d) Ensure that prior to the maintenance works occurring the channel is inspected for the presence of eels. If eels are present within the channel, then the consent holder shall ensure that prior to any work commencing they are removed (trap and transfer) and returned to the main stem of the Oreti River.

(e) Ensure that there shall be no washing or refuelling of machinery in the bed of the watercourse.

(f) Ensure that all construction equipment, machinery, plant, and debris is removed from the site on completion of the works.

6. There shall be no discharge to the Oreti River during the channel maintenance works that may cause or result in any of the following to occur after a zone of reasonable mixing, being 150m downstream of the confluence of the channel embayment and the main stem of the Oreti River:

(a) Conspicuous oil or grease films, scums or foams, or floatable or suspended materials;

(b) Conspicuous change in the colour or visual clarity;

(c) Emission of objectionable odour; or

(d) Rendering of river water unsuitable for consumption by farm animals.

7. The consent authority may serve notice of its intention to review the conditions of this consent, in accordance with the conditions of this resource consent and Sections 128 and 129 of the Resource Management Act 1991, during the period March to July each year for the purposes of addressing any adverse effects on the environment which may arise from the exercise of this consent, and which it is appropriate to deal with at a later stage, or which become evident after the date of commencement of the consent.

Details of Permit – Wastewater to land (temporary storage)

Purpose for which permit is granted:		To discharge treated wastewater to land in circumstances that any result in contaminants entering water, from a contingency short term storage area
Location	- site locality	Crowe Road, Lorneville
	- map reference	E46:478-181
	- catchment	Oreti
Legal description of land at the site:		Part Section 45 Block XIV Invercargill Hundred
Term:		This consent will expire on xxxx (35 years)

Schedule of Conditions

1. Subject to complying with the conditions of this consent, the activities authorised by this consent shall be undertaken so as to be consistent with the application for this consent and the documents titled:

   (a) Assessment of Environmental Effects dated November 2015

2. This resource consent authorises the discharge of treated wastewater onto land, which may result in contaminants entering water via seepage, for contingency short term storage of wastewater in an 8.3 hectare area of land at the location specified above.

3. The consent holder shall advise Environment Southland, Invercargill City Council, and the landowners and or occupiers adjacent to part Section 45 Block XIV Invercargill Hundred (the lagoon site), prior to each period of discharge of treated wastewater into the lagoon.

4. The maximum continuous period of storage in any one storage event shall not exceed three months.

5. The wastewater discharged to land shall be of a quality sufficient to comply with conditions xx and xx of Consent XXXX (referring to the wastewater discharge to water consent) the discharge of wastewater into the Makarewa River.

6. At least once each week while wastewater is stored within the temporary storage area the consent holder shall inspect the area around the site, and the northern end of Leonard Road, to assess odour effects. The following observations are to be noted during each inspection.

   (a) Date, time, wind direction and a description of wind strength;

   (b) Whether or not odour was detected and, if detected, the location;

   (c) The offensiveness and intensity of the odour; and

   (d) Whether or not the odour was, in the opinion of the consent holder, attributable to the wastewater in the storage area.

A copy of the latest inspection report is to be forwarded to the consent authority each week while monitoring occurs under this condition.

7. The consent authority, may service notice of its intention to review the conditions of this consent, in accordance with sections 128 and 129 of the Resource Management Act 1991, within five working days of receiving the report prepared in accordance with condition 6 for the purposes of dealing with any adverse odour effects on the environment which may arise from the exercise of this consent.

APPENDIX C

Assessment of Proposed Southland Water and Land Plan

Objectives and Policies

Provision	Detail	Assessment
Objective 1	Land and water and associated ecosystems are managed as integrated natural resources, recognising the connectivity between surface water and groundwater, and between freshwater, land and the coast.	Alliance recognises that actions taken at the Plant can affect the whole of the receiving environment in which it operates. It is recognised that a reduction in nutrient discharges contribute (albeit in a limited way) to improvements in the downstream environment and coastal estuary, and the avoidance of impacts on migratory fish has upstream benefits.
Objective 2	Water and land is recognised as an enabler of the economic, social and cultural wellbeing of the region.	The Lorneville Plant is a significant industrial activity which provides significant social and economic benefits to the Southland Region and local community. The Plant's operation relies on access to a reliable water source, as well as the ability to dispose of treated waste.
Objective 3	The mauri (inherent health) of waterbodies provide for te hauora o te tangata (health of the people), te hauora o te taiao (health of the environment) and te hauora o te wai (health of the waterbody).	Alliance's discharges are not currently adversely affecting the life supporting capacity of soil, water and land resources. Notwithstanding this Alliance is committed to progressively improving the quality of its discharges to water via a comprehensive upgrade to its wastewater treatment plant. Alliance is also committed to ensuring its discharge to the Makarewa River does not compromise the ability of the Regional Council to implement broader obligations under the Freshwater NPS.
Objective 4	Tāngata whenua values and interests are identified and reflected in the management of freshwater and associated ecosystems.	Consultation with Te Ao Marama and the preparation of a cultural values report has been key in understanding the Maori values of the area and natural resources. The key cultural impacts arising from the Plant's discharges to land, water and air have been identified, and the measures to avoid, remedy or mitigate adverse effects have been developed. The key mitigation relates to Alliance's commitment to improve the overall quality of the Plant's treated wastewater discharge to water, as well as the preparation and implementation of an onsite habitat management plan.
Objective 5	Ngāi Tahu have access to and sustainable customary use of, both commercial and non-commercial, mahinga kai resources, nohoanga, mātaitai and taiāpure.	As noted above, consultation with Iwi has been ongoing and it is proposed to develop and implement a habitat enhancement management plan that will aim to take a holistic approach to environmental management onsite at the Plant in order to align with cultural values and goals identified by Te Ao Marama during consultation.

Objective 6	There is no reduction in the quality of freshwater, and water in estuaries and coastal lagoons, by: (a) maintaining the quality of water in waterbodies, estuaries and coastal lagoons, where the water quality is not degraded; and (b) improving the quality of water in waterbodies, estuaries and coastal lagoons, that have been degraded by human activities.	Alliance is committed to improving the quality of its discharge to the Makarewa River. Primary treatment upgrades already completed have seen a reduction in nitrogen loads and a more significant reduction will be achieved via the comprehensive wastewater treatment plant upgrade that is proposed.
Objective 7	Any further over-allocation of freshwater (water quality and quantity) is avoided and existing over-allocation is phased out in in accordance with timeframes established under Freshwater Management Unit processes.	The proposed abstraction from the Oreti River will not contribute to any over allocation issues.
Objective 8	(a) The quality of water in aquifers that meet both the Drinking-Water Standards for New Zealand 2005 (revised 2008) and any freshwater objectives, including for connected surface waterbodies, established under Freshwater Management Unit processes is maintained; and (b) The quality of water in aquifers that have been degraded by land use and discharge activities (with the exception of those aquifers where ambient water quality is naturally less than the Drinking-Water Standards for New Zealand 2005 (revised 2008)) is improved.	Groundwater monitoring indicates that downstream samples were generally below their respective maximum acceptable value and guideline value set out in the Drinking Water Standards, with the exception of both field and laboratory pH, which were below the guideline value of 7 – 8.5. This is however likely to be due to natural occurrences and is not attributable to the discharge of the wastewater to land. Ongoing monitoring of the soil and groundwater resources will ensure that there are no adverse effects on groundwater from the proposed discharges to land.
Objective 9	(a) The quantity of water in surface waterbodies is managed so that aquatic ecosystem health, life-supporting capacity, outstanding natural features and landscapes, recreational values, natural character, and historic heritage values of surface waterbodies and their margins are safeguarded; and (b) Provided (a) is met, water is available both instream and out-of-stream to support the reasonable needs of people and communities to provide for their social, economic and cultural wellbeing.	The assessment completed with regard to the proposed abstraction considers that the volume is of a scale that will have a minor or less than effect on the river's hydrology, water quality and biological communities and fish species. Given this, the proposed abstraction will not compromise such values within the Oreti River. Access to a reliable water resource is an essential component of the Plant's ability to operate, and this is more critical during times of extreme drought as animal welfare is often at stake.

Objective 11	Water is allocated and used efficiently.	The proposed abstraction from the Oreti River will not result in the over allocation of the water resource. Water used in the Plant's operations is used as efficiently as possible to ensure there is no wastage.
Objective 13	Enable the use and development of land and soils, provided: (a) the quantity, quality and structure of soil resources are not irreversibly degraded through land use activities and discharges to land; (b) the discharge of contaminants to land or water that have significant or cumulative effects on human health are avoided; and (c) adverse effects on ecosystems (including diversity and integrity of habitats), amenity values, cultural values and historic heritage values are avoided, remedied or mitigated to ensure these values are maintained or enhanced.	The effects of the wastewater irrigation application to land are well understood, as monitoring of soil and water resources has been undertaken by Alliance since 2001. This monitoring has confirmed that there are no adverse effects arising within the soil or groundwater resources as a result of this discharge, as monitoring confirms that concentrations of contaminants in soil and groundwater remain low and relatively consistent. It is identified that certain areas of the Plant farm land are not suitable for the application of treated wastewater and therefore these areas are to be avoided to prevent any adverse effects on the soil resource. The Plant's discharges to water and to land are not identified as having a significant adverse effect on the human health. The water quality in the Makarewa River is characteristic of a lowland river in Southland. At times faecal coliforms can be elevated in the river. As part of the wastewater treatment upgrade Alliance will review whether it is necessary to include as part of the upgrade technology in order to further treatment faecal coliforms in the discharge. This will be undertaken at Year 5 of the consent and take into account catchment improvements.
Objective 14	The range and diversity of indigenous ecosystem types and habitats within dryland environments, rivers, estuaries, wetlands and lakes, including their margins, and their life-supporting capacity are maintained or enhanced.	The assessments have not identified that the discharges to land and water, and the proposed abstraction is having an adverse effect on the riverine, nor estuarine ecosystems and habitats. The river is characteristic of a lowland river environment and habitat is largely influenced by the locality of the river (i.e. tidal influences), rather than water quality. The overall water quality in the catchment is low, however this does not appear to adversely affect life supporting capacity in the river as it still supports water and habitat tolerant invertebrate taxa and a diverse fish community. It is noted that the water quality in the New River Estuary is being affected by point and non point source discharges throughout the catchment. Improving the quality of the discharge from the Plant will only result in a localised improvement in the river environment, and without a catchment wide

		initiative improvement in the water quality within the New River Estuary will not be achieved. Alliance is however committed to contributing by improving the quality of its discharges as described in the application.
Objective 15	Taonga species, as set out in Appendix M, and related habitats, are recognised and provided for.	The assessments have identified that the rivers affected by Alliance's discharges and abstraction continue to support a moderate to high native fishery. With regard to the proposed wastewater discharge a reduction in contaminants to the river will improve water quality, and reduce any potential for toxicity effects. Alliance is also proposing to improve habitat in and around the Plant that support species such as those identified in Appendix M (i.e. riparian margins). The proposed channel maintenance will also be managed so as to avoid, remedy or mitigate any adverse effects on native aquatic species such as eels.
Objective 16	Public access to river and lake beds is maintained, except in circumstances where public health and safety are at risk.	No changes to public access is proposed. However it is noted that for health and safety reasons access to and around the discharges and intake structure will not be encouraged. There are also significant physical impediments to accessing the Makarewa River in and around the discharge point which limits the ability of the public to use this area for recreational or other pursuits.
Objective 17	The natural character values of wetlands, rivers and lakes including channel form, bed rapids, seasonably variable flows and natural habitats, are protected from inappropriate use and development.	Alliance's activities operate within a highly modified riverine environment, primarily due to historical and current land use in the catchment.
Objective 18	All activities operate at "good (environmental) management practice" or better to optimise efficient resource use and protect the region's land, soils, and water from quality and quantity degradation.	The effects arising from Alliance's current and proposed activities are well understood through existing monitoring data and further additional modelling and assessment that has been undertaken as part of the current consent investigations. These assessments confirm that Alliance's activities are not having a significant adverse effects on the surrounding environment or resources and that its onsite management practices, emissions and discharge controls are operating at a level consistent with good management practices. In regard to the proposed upgrades and ongoing management of its current and future discharges into the receiving environment it is considered that what is proposed is representative of the best practicable option. Alliance is also committed to ensuring that its

		activities and discharges do not allow the current state of the receiving environment to worsen, and in the longer term will be improved.
Provision	**Detail**	**Assessment**
Policy 1 – Enable papatipu runanga to participate	Enable papatipu rūnanga to effectively undertake their kaitiaki responsibilities in freshwater and land management through Environment Southland: 1. providing copies of all applications that may affect a Statutory Acknowledgement area, tōpuni, nohoanga, mātaitai or taiāpure to Te Rūnanga o Ngāi Tahu and the relevant papatipu rūnanga; 2. identifying Ngāi Tahu interests in freshwater and associated ecosystems in Southland/Murihiku; 3. reflect Ngāi Tahu values and interests in the management of and decision-making on freshwater and freshwater ecosystems in Southland/Murihiku, consistent with the Charter of Understanding.	As set out above, through consultation with TAMI and the preparation of the Cultural Values Report, the potential effects of the activities on cultural values are well understood by Alliance. Mitigation to address these matters has been included as part of the proposal. This includes: • The commitment to improving water quality in the Makarewa River; • Pre and post upgrade water quality, habitat and fish health surveys; • Restoration of oxbow habitat and riparian planting where appropriate as part of the Habitat Enhancement Plan. Consultation with TAMI is also proposed as a requirement of the TWP and in preparation of the Habitat Enhancement Plan.
Policy 2 – Take into account iwi management plans	Any assessment of an activity covered by this plan must: 1. take into account any relevant iwi management plan; and 2. assess water quality and quantity based on Ngāi Tahu indicators of health.	
Policy 3 – Ngai Tahu ki Murihiku taonga species	To manage activities that adversely affect taonga species, identified in Appendix M.	
Policy 6 - Gleyed	In the Gleyed physiographic zone, avoid, remedy, or mitigate adverse effects on water quality from contaminants, by: 1. requiring implementation of good management practices to manage adverse effects on water quality from contaminants transported via artificial drainage, and overland flow where relevant; 2. having particular regard to adverse effects on water quality from contaminants transported via artificial drainage, and overland flow where relevant when	It is understood that the physiographic zone relate to the classification of land and risks to water quality based on factors including soil type, landscape classification, climate, topography and water chemistry. It appears that such provisions are more relevant to land use activities such as farming. Having said that, the assessments as noted above have adopted an approach whereby the effects of the collective activities and discharges from the Plant have been considered, for example the effects of the land disposal has included an assessment of the effects on groundwater and surface water. In this regard it does not appear

	assessing resource consent applications and preparing or considering management plans.	that any land use activities, use of the ponds or the discharges to land are causing any observable adverse effect on groundwater, and if nutrients are entering the surface water system these are being captured by the monitoring and analysis that tis being undertaken downstream of the Plant.
Policy 13 – Management of Land Use Activities and discharges	Manage land use activities and discharges (point source and non-point source) to land and water so that water quality and the health of humans, domestic animals and aquatic life, is protected.	Alliance is committed to improving the quality of its discharge to water and this in turn will contribute to an enhancement in water quality within the Makarewa River. It is considered that the proposed reduction in contaminants from the Plant's discharge will contribute to the overall catchment improvements that are anticipated to be achieved via the Council's development and implementation of catchment limits. Achieving an overall catchment improvement will ensure that water quality sufficiently protects human health, domestic animals and aquatic life.
Policy 14 – Preference for discharges to land	Prefer discharges to land, rather than direct discharges to water.	Alliance has undertaken a detailed analysis into alternatives for its discharge to water, including treatment options and full land disposal. The costs of upgrading the treatment plant and acquiring land are significant, and having regard to the best practicable option obligations inherent under the RMA, full land disposal was not considered to comprise the best alternative to manage the discharge.
Policy 15 – Maintaining and improving water quality	Maintain and improve water quality by: 1. despite any other policy or objective in this Plan, avoiding new discharges to surface waterbodies that will reduce water quality beyond the zone of reasonable mixing; 2. avoiding point source and non-point source discharges to land that will reduce surface or groundwater quality, unless the adverse effects of the discharge can be avoided, remedied or mitigated; 3. avoiding land use activities that will reduce surface or groundwater quality, unless the adverse effects can be avoided, remedied or mitigated; and 4. avoiding discharges to artificial watercourses that will reduce water quality in a river, lake or modified watercourse beyond the zone of reasonable mixing;	As set out above, Alliance is committed to ensuring its activities and discharges to water do not give rise to a situation where water quality directly attributable to the Plant deteriorates from its current condition, and is seeking to improve the quality of it discharge and receiving water quality through more stringent compliance limits relating to ammonia and nitrogen loads in the interim and significantly so post upgrade of the wastewater treatment plant. This is consistent with the policy intent to maintain and improve water quality. It is acknowledged that these improvements are unlikely to be observable within the wider catchment without a catchment wide improvement, however the limits that are proposed have been developed taking into account likely future catchment limits and improvements and Alliance is committed to doing its part in this regard.

	so that: 1. water quality is maintained where it is better than the water quality standards specified in Appendix E "Water Quality Standards"; or 2. water quality is improved where it does not meet the water quality standards specified in Appendix E "Water Quality Standards"; and 3. water quality meets the Drinking-Water Standards for New Zealand 2005 (revised 2008); and 4. ANZECC sediment guidelines (as shown in Appendix C of this Plan) are met.	
Policy 17 – Effluent management	1. Avoid adverse effects on water quality, and avoid as far as practicable other adverse environmental effects of the operation of, and discharges from effluent management systems. 2. Manage effluent systems and discharges from them by: (a) designing, constructing and locating systems appropriately and in accordance with standards; (b) maintaining and operating effluent systems in accordance with best practice guidelines; (c) avoiding any surface run-off/overland flow, ponding or contamination of water resulting from the application of agricultural effluent to pasture; (d) avoiding the discharge of raw sewage and untreated agricultural effluent to water.	The assessments observe that the lower Makarewa River is characteristic of a lowland river environment, and although there are elevated nutrient concentrations due to the cumulative effects of discharges throughout the catchment, the river still exhibits a reasonable degree of ecosystem health. This indicates that the discharge is not having a direct impact on water quality to the point where species composition or health is being compromised. It is acknowledged however that the current discharge quality cannot achieve the likely regional water quality limits for ammonia and other water quality standards and as such Alliance is committed to improving the quality of its discharge and is committed to doing its part in achieving an overall catchment improvement in water quality. The evidence of Mr Khan explains in detail the management of the wastewater treatment plant and associated discharges to land and to water and how these will be managed.
Policy 20 – Management of water resources	Manage the taking, abstraction, use, damming or diversion of surface water and groundwater so as to: 1. avoid, remedy or mitigate adverse effects from the use and development of surface water resources on: (a) the quality and quantity of aquatic habitat; (b) natural character values, natural features, and amenity, aesthetic and landscape values; (c) areas of significant indigenous vegetation and significant habitats of indigenous fauna; (d) recreational values;	The effect of the abstraction from the Oreti River has been assessed as being low and therefore is considered to be consistent with this policy requirement.

	(e) the spiritual and cultural values and beliefs of tangata whenua; (f) water quality, including temperature and oxygen content; (g) the rights of lawful existing users; (h) groundwater quality and quantity; (i) historic heritage values; (j) mātaitai, taiāpure and nohoanga; 2. avoid, remedy or mitigate significant adverse effects from the use and development of groundwater resources: (a) long-term aquifer storage volumes; (b) the reliability of supply for existing groundwater users; (c) surface water flows and levels, particularly in spring-fed streams, and aquatic ecosystems and habitats; and (d) water quality; 3. ensure water is used efficiently and reasonably by requiring that the rate of abstraction and abstraction volumes specified on water permits to take and use water are no more than reasonable for the intended end use; 4. recognise the positive effects resulting from the use and development of water resources.	
Policy 22 – Management of the effects of groundwater and surface water use	Manage the effects of surface and groundwater abstractions by: 1. avoiding allocating water to the extent that the base flow of any waterway is depleted, in order to protect the mauri of that waterway and mahinga kai or taonga species; 2. ensuring interference effects are acceptable, in accordance with Appendix L.3; 3. utilising the methodology established in Appendix L.2 to: (a) manage groundwater abstractions with a daily volume exceeding 86 cubic metres per day on surface waterbodies; and (b) assess and manage the effects of groundwater abstractions with a daily volume exceeding 86 cubic	The proposed abstraction will not result in the over allocation of the Oreti River.

	metres per day in groundwater management zones other than those specified in Appendix L.5.	
Policy 25 – Priority Takes	When issuing a water shortage direction, Environment Southland will give priority to water abstraction for the following uses: 1. reasonable domestic needs; 2. reasonable animal drinking needs; 3. fire-fighting purposes; 4. public health needs; or 6. animal welfare needs.	The proposed abstraction is necessary to enable the ongoing operation of the Plant, particularly during times of extreme drought. It is therefore critical that access to a reliable water source is maintained for animal welfare reasons.
Policy 28 – Structures and bed disturbance activities of rivers (including streams and modified watercourses) and lakes	Manage structures and bed disturbance activities in the beds of rivers and lakes, to avoid, remedy or mitigate adverse effects on: 1. water quality and quantity; 2. habitats, ecosystems and fish passage; 3. indigenous biological diversity; 4. historic heritage; 5. the spiritual and cultural values and beliefs of the tangata whenua; 6. mātaitai and taiāpure; 7. public access (except in circumstances where public health and safety are at risk) and amenity values; 8. natural character values and outstanding natural features; 9. river morphology and dynamics, including erosion and sedimentation; 10. flood risk; 11. infrastructural assets; and 12. navigational safety.	The proposed abstraction and channel maintenance that is proposed will be managed so as to avoid, remedy or mitigate the any adverse effects on the values specified in this policy. This will be achieved through the appropriate timing of channel maintenance works, the installation of a finer fish screen, and suitable controls during any channel maintenance works including the requirement to inspect the channel for eels prior to any works commencing.

Policy 32 – Protect significant indigenous vegetation and habitat	Protect significant indigenous vegetation and significant habitats of indigenous fauna to improve soil health, water quality, water quantity and ecosystem health.	Aside from vegetation and habitats within the New River Estuary the assessments have not identified any significant sites that will be affected by the proposal. Improvement in the quality of the water within the New River Estuary will be achieved via a whole of catchment improvement.
Policy 39A – Integrated Management	To improve integrated management of freshwater and the use and development of land in whole catchments, including the interactions between freshwater, land and associated ecosystems (including estuaries).	As noted above, Alliance is committed to doing its part with respect to an overall catchment improvements with regard to water quality and the proposed timing of its wastewater upgrade and compliance with more stringent interim and future ammonia limits in particular will contribute to this. Consistent with this policy it needs to be recognised that although these localised improvements are significant, there will not be any observable downstream effects until a total catchment improvement is achieved.
Policy 40 – Determining the term of resource consents	When determining the term of a resource consent consideration will be given, but not limited, to: 1. granting a shorter duration when there is uncertainty regarding the nature, scale, duration and frequency of adverse effects from the activity or the capacity of the resource; 2. relevant tangata whenua values and Ngāi Tahu indicators of health; 3. the duration sought by the applicant, plus material to support the duration sought; 4. the permanence and economic life of any capital investment; 5. the desirability of applying a common expiry date for water permits that allocate water from the same resource or land use and discharges that may affect the quality of the same resource; 6. the applicant's compliance with the conditions of any previous resource consent; and 7. the timing of development of FMU sections of this Plan, and whether granting a shorter or longer duration will better enable implementation of the any revised frameworks established in those sections.	As outlined in my evidence, I do not agree that a shorter duration consent term for any of the permits being sought is appropriate or necessary. Consistent with Policy 40 the key reasons for this are as follows: • The effects of the current discharges and activities are well known and understood; • Alliance is committed to a significant improvement to its key discharges to water and to air which requires significant capital investment. It is appropriate that certainty is provided by a longer duration consent in order for the Company to fully commit to these improvements, without jeopardising the economic viability of the Plant. • The Plant is a significant industrial activity providing social and economic benefits to Southland. • The consents being sought by Alliance are all inextricably linked to the overall operation, maintenance and upgrading of the Plant, it makes sense from an environmental and economic efficiency viewpoint to apply a common expiry date so that all of the matters can be considered together. This is the purpose of aligning the water abstraction consent which currently does not expire until 2027 with the other key discharge activities.

		• Alliance carefully manages it operations in order to meet the various performance standards set out within existing consent conditions, and as part of these applications is committing to a significant amount of ongoing monitoring and reporting. • The proposed timing and compliance limits for ammonia and other water quality indicators post upgrade of the wastewater treatment system is intended to pre-empt and fulfil Alliance's obligations with respect of any catchment review process for improving water quality. Review obligations are also proposed to be built into the conditions to ensure Alliance keeps on top of any catchment wide improvements and is consistent with these. The use of a shorter duration consent term seems an inefficient and inappropriate mechanism to manage any potential issues the future FMU catchment limits.
Policy 41 – Matching monitoring to risk	Consider the magnitude of environmental effects and risk when determining requirements for auditing and supply of monitoring information on resource consents.	The proposed monitoring is considered to be commensurate with the environmental effects and risks identified.
Policy 44 – Implementing Te Mana o te Wai	Te Mana o te Wai is recognised at a regional level by tangata whenua and the local community identifying values held for, and associations with, a particular waterbody and freshwater management unit. Particular regard will be given to the following values, alongside any additional regional and local values to be determined in the freshwater management unit limit setting process: • Te Hauora o te Wai/the health and mauri of water; • Te Hauora o te Tangata/the health and mauri of the people; • Te Hauora o te Taiao/the health and mauri of the environment; • Mahinga kai/food gathering, places of food; • Mahi māra/cultivation; • Wai Tapu/Sacred Waters; • Wai Māori/municipal and domestic water supply;	These policies are more directives at the Council in setting appropriate catchment limits. However as noted above it is considered that Alliance's proposed activities, in particular the management of its current and future discharge to water pre-empts and would fulfil its obligations in respect of any catchment review process for improving water quality.

	• Āu Putea/economic or commercial development; • He ara haere/navigation.	
Policy 45 – Priority of FMU policies and rules	1. In response to Ngāi Tahu and community aspirations and local water quality and quantity issues, FMU sections may include additional catchment-specific objectives and policies. These FMU objectives and policies will be read and considered together with the region-wide objectives and policies. Any policy on the same subject matter in the relevant FMU section of this Plan prevails over the relevant policy within this Regional Policies Section, unless it is explicitly stated to the contrary. As the FMU sections of this Plan are developed in a specific geographical area, FMU sections will not make any changes to the region-wide objectives or policies and will not deviate from the structure and methodology outlined in these Process Policies.	
Policy 46 – Identified FMUs	The FMU Sections of this Plan are based on the following identified Freshwater Management Units for Southland, as shown on Map Series 7: Freshwater Management Units: • Fiordland and the islands; • Aparima; • Mataura; • Ōreti; and • Waiau.	
Policy 47 – FMU Process	The FMU sections will: 1. establish freshwater objectives for each catchment, having particular regard to the national significance of Te Mana o te Wai, and any other values developed in accordance with Policies CA1-CA4 and Policy D1 of the National Policy Statement for Freshwater Management 2014;	

	2. set water quality and water quantity limits and targets to achieve the freshwater objectives; 3. set methods to phase out any over-allocation, within a specified timeframe; and 4. assess water quality and quantity based on Ngāi Tahu indicators of health.	