FLAG MEETING NOTES: 19 August 2015

Purpose:	Waimea Plains Freshwater and Land Advisory Group (FLAG) – Meeting 10
Date:	19 August 2015
Time:	9.30am-1.30pm
Venue:	Wangapeka-Heaphy Rooms - TDC Richmond
Present:	**FLAG members:** Philip Woollaston (Chair) Matt Hippolite (iwi representative on FLAG) (Deputy Chair) Gavin O'Donnell Lawson Davey Dennis Cassidy Zane Mirfin Heather Arnold Mirka Langford Martin Rutledge **Staff:** Mary-Anne Baker (Senior Environmental Policy Planner) Lisa McGlinchey (Environmental Policy Planner) Joseph Thomas (Resource Scientist – Water) Trevor James (Resource Scientist – Environmental Quality) (arrived ~11am) **Guest presenters:** Andrew Fenemor (Landcare Research)
Apologies:	Dean Rainham, Pierre Garguilo, Nick Patterson
Notes taken by:	Lisa McGlinchey (supplemented by other staff)
Definitions and Abbreviations	FLAG=Freshwater and Land Advisory Group WWMC= Waimea Water Management Catchment TTIFAK = Te Tau Ihu Freshwater Advisory Komiti (interim name for group until finalised) NPSFM= National Policy Statement for Freshwater Management 2014 NOF= National Objectives Framework TRMP = Tasman Resource Management Plan SOE = State of the Environment **Unconfined aquifer** = are those where permeable strata are open to the ground surface. Surface water (rainfall and/or river flow) is able to seep from the ground surface directly to the aquifer. **Confined aquifer** = are those where permeable groundwater bearing strata are separated from the land's surface by an impermeable layer (such as silt or clay) that prevents surface water from directly seeping into the aquifer. Groundwater migrates to confined aquifers from an unconfined recharge area located elsewhere. AGUA= Appleby Gravel Unconfined Aquifer UCA=Upper Confined Aquifer LCA= Lower Confined Aquifer N=Nitrogen, P=Phosphorus
Note: records of discussion points have been grouped into similar topics and are not necessarily in the order discussed at the meeting.	
FLAG MEMBERS PLEASE NOTE: If you have any questions or need anything between meetings, then please contact Mary-Anne Baker by email: marya@tasman.govt.nz or by phone ddi 03 543 8486.	

Session 1 – Issues arising from previous meeting

- The FLAG sends their congratulations to Pierre on his new baby.
- No issues arising from the previous meeting notes from June meeting.

Management Objectives Feedback Summary – Mary-Anne Baker

- Three comprehensive written feedbacks were received – from HortNZ, the Waimea Inlet, and E. Challies.
- Staff will compile a summary and forward along with copies of the feedback to FLAG.

Action: MAB to send out copies of feedback and staff summary to FLAG.

Session 2: Modelling Results

Presentation: Sharing the Nitrate Pie – Mary-Anne Baker

Key points

- Drinking water standards – 11.3g/m3 nitrate-nitrogen
- Aquatic freshwater ecology
  - Nitrate toxicity – NOF bottom line is 6.9g/m3, but review of this accounting for water hardness means we will meet the 'A' band at <7g/m3
  - Periphyton growth – affected by multiple factors – of which nitrate is only one so cannot managed periphyton through nitrate management alone.
- Coastal ecosystems
  - Nitrate toxicity not a concern in coastal waters
  - Some localised growth of algae where streams discharge, but nitrate load range currently below the range for macroalgal growth
  - Recommended limit for total load 610t/yr (current load was estimated at about half this)
  - Nitrate levels currently within 'A' band (given adjustments for water hardness)
  - Springs are Phosphorus limited – the Phosphorus that is there is believed to come mainly from surface runoff, not from spring water.

Discussions and questions arising from presentation:

Coastal Springs:

There are a lot of nutrients locked up in built up sediments. These could possibly be removed.
LM: Trevor James is looking at options for removal of these sediments. He has trialled this previously, but had issues with the equipment used.

[Restoration of the creeks] could be a cost effective option when paid for by the whole catchment community [as opposed to simply nitrate management for the springs].

Do we know where the runoff contributing the Phosphorus in the springs is coming from?
We don't have sufficient information to determine this as yet – but it is assumed to be from runoff as levels are low in the spring waters.

Regarding the springs management - we don't want nitrates to get worse.

There are likely to be more cost effective options for managing periphyton in the springs, such as shading and sediment management.

AF: We are having similar discussion in Takaka regarding the Te Waikoropupu Springs – the Takaka FLAG have been looking at periphyton growth with nitrate triggers around ANZECC guidelines of 0.44g/m3.

Does the current NOF refer to hardness in relation to Nitrate toxicity?
No it doesn't.
It would be useful if the guidance document did reflect this aspect.

For how long can you exceed the nitrate thresholds before you see toxic effects?
The 10g/m^3 attribute state for Borck and Pearl Creeks is likely to give protection to 95% of freshwater aquatic species.

Does the level of water hardness fluctuate?
AF: Not a lot, it is buffered by the water coming through the spring – it is geology related. *[Measured hardness over the past 2 years in Neimann Creek ranges from 106-132* and for Pearl Creek 92-98 g/m^3 as $CaCO_3$].

Coastal Ecosystems:

Do we look at the cumulative impacts of loads from the biosolids from Rabbit Island?
The load from the treatment plant discharge (rather than the biosolids) has been included within the estimate of the total current nitrate load to estuary. The wastewater fraction of this was estimated at ~ 100t/yr [out of ~288t/yr total]. Effects will also depend on the amount brought back on the next tide.
[TJ: The latest compliance monitoring report by Cawthron about the effects of the biosolids operation showed no effects of their operation in respect to nutrients (potentially some effect from disease-causing organisms)].

The Regional Sewerage Scheme will have amounts of nitrate leaching from the biosolids spread under pines on Rabbit Island
JT: They have monitored the groundwater (under Rabbit Island) and found the nitrate levels to be very low.

Where has the total nitrate load for the coastal area come from?
MAB: this was work that Wriggle [coastal management consultants] have done.

The total nitrate load shown in this presentation is less than more recent SPASMO work has shown (245 vs ~ 288 t/yr).

Action: Staff to update tonnes/yr estimates with recent SPASMO information.

Is there an issue of maximum peak loads – ie pulses of nutrients to the estuary?
This is not something Wriggle has specifically looked at. The focus of investigations to date is the expression of nutrient loads to the estuary ie macroalgal growth. You would expect higher loads (but not higher concentrations) during floods, but tidal flushing is good. Seasonal variation could also be looked at, as nitrate comes mainly via groundwater and phosphorus mainly via surface runoff.

How does the 610t/yr threshold relate to a g/m3 concentration?
Staff could work this out. However the 610 is a load across the whole estuary whereas the nitrate concentration limits are for rivers, streams and groundwaters as they relate to different effects. SPASMO results estimate current load at 288 t/yr so a doubling of output would still be below 610 t/yr threshold.

Action: Staff to work out concentration for coastal threshold and advise FLAG.

ZM: We are already seeing something occurring in the Motueka River as the river becomes degraded with mayflies dying out and it becoming a more caddisfly dominant system. The Waimea River looks in pretty good shape from the numbers. If we can hold the Waimea River at current levels we would be doing well.
Yes – as an average.

Presentation: Revised Draft Modelling Report – Andrew Fenemor

Discussion of updated draft modelling report [titled: *Modelling of Source and Fate of* Nitrate-Nitrogen Losses from Waimea Plains Land Uses*]* led by Andrew Fenemor (Landcare Research).

- If FLAG members see any numbers they disagree with or don't understand, please let Andrew Fenemor know.
- We are assuming **no nitrate attenuation** in the gravels [*vadose zone*] below the soil profile or in the aquifers.
- However, there will be dilution where river waters feed into the aquifers, which is mainly in the Appleby Gravel Unconfined Aquifer near the rivers. This will also include reductions in concentrations if there is a dam.

HA: Regarding forestry – this includes areas of scrub - was there any consideration of gorse nitrate leaching amounts in these areas?
No, this was not specifically included**.**
There is some debate about the research behind gorse leaching.
If the nitrogen losses from gorse were as high as suggested we would be seeing the effect in water bodies – but we are not seeing this in gorse-clad catchments.

ML: The production figures for dairy are quite high. These may not be representative – it may represent only the highest producing farm. Dry matter figures are also high.
Action: ML to provide production and dry matter data to AF.

PW: The leachate modelled from grapes is several times the nitrate application rate and higher than that for apples, which have a much higher application rates. I'm not sure how this eventuates.
This may come down to what is planted inter-row. We have clover in our inter-row (apples) and we have high soil nitrate.
Yes we need to clarify what nitrate is caused from crops and what is caused by other factors.
AF: Yes the brief answer to this question last time from Steve Green was mineralisation, but I expect mineralisation over 40 vs 20 years would be very different.
[AF: Subsequent discussion with Greg Dryden suggests that the main reason for lower losses from apples is the removal of substantial nitrogen in harvested fruit, which is much lower for grapes].

For vineyards we could also look at going back to cultivation in inter-row areas such as used in European systems. If we don't have water we won't be growing pasture or clover inter-row.

It is thought that stygofauna processes some nutrients, but we don't know how much.
There are also bio-geochemical processes that can attenuate nutrients.
There is not much research on the stygofauna attenuation topic.
There is some research showing clogging of natural aquifer porosity with higher nutrients and subsequent biological growth.
JT: This is likely to be from gross levels of pollution.
AF: At lower levels of nutrient loss, increased biological growth could also lead to increased attenuation of nutrients.

MAB – Pierre asked a question about what support there is for the modelling – what is the confidence around the relative contribution from market gardening relative to other uses given the lack of research data around market gardening.

- *AF: That is a good question and highlights the need to do more research on market gardening*
- *MAB: Do we still think the relativity is correct – ie is market garden the highest* leaching use after dairy?

- **AF:** The processes simulated within the plant and soil are consistent in SPASMO regardless of the land use type, and the model performs very well against research data from other parts of NZ for apples and grapes, given accurate input data.
- The crop cycles and time between crops can impact leaching rates significantly.
- I'm surprised they put nitrogen fertiliser on two weeks before planting. This seems too short a time to have good uptake into plants. There is not a lot of good information of the types of nitrogen they are using and when. We need to determine if current practices are good or best industry practice for nitrate leaching.

Philip read some further feedback points from Pierre who was unable to attend the meeting:

1. *Is there any actual evidence that there is a nitrogen issue on the plains other than the historical issue? Do we actually know what we have to achieve on possible nitrogen leaching?*
2. *Again market gardening has been singled out as "the worst case scenario" Under what data has this been reached? We all know that market gardening is a high N user but also has a high n % uptake. I understand that there has been no testing on nitrogen on market gardening vs any other land use on the plains. These models are based on assumptions and not actual data. So how can anyone consider any kind of decision on this? The industry has requested to work with one of the principles of these models and they have initially refused to be involved. The industry has started to collect their own data and I believe have the only actual data available. Again we can't make any decision on assumptions there is far too much at stake – peoples livings!.*
3. *We (FLAG) need to be mindful when considering the opinions of external societies. Everything that we do has to be practical and workable for all land users.*
4. *To summarise as I have noted in past meetings we need to take stock of what actual data and information is available and not rely on assumptions or models. This process may need to be slowed to allow sufficient time to collect this information. We cannot put in "rules" and "hard limits" that are unworkable or attainable using "best practice" as is in use in other areas around the country that have completed a similar exercise.*

Discussion points on these issues:

- MAB: Dean Rainham has done a lot of work putting in a SFF application to work with market gardeners and Council to do more monitoring. However there have been issues with capacity in the monitoring industry to undertake this work given projects being done elsewhere so the current proposal did not proceed. We may need to assist them to find funding from elsewhere.
- It is harder to claw-back than to manage proactively – if the dam goes ahead and we have more dairying, we would then be focussed on how to manage dairy, but market gardening seems more likely than dairy.
- We need to make sure we don't allow a whole lot of investment into land uses that we then seek to claw-back in the future.
- We do need to do some ground-truthing of assumptions.
- We want to have an evidence based discussion.
- Nitrate and/or water transfers from other land use types have been suggested.
    - Market gardeners have been doing this internally with water used in closed system glasshouses instead of adjacent pastoral land uses during dry periods.
- We need hard information on actual outputs of market gardening and identification of whether the practices can be changed to reduce the outputs.

Should there be some method assumptions included in the modelling report - eg inter-row crops and other aspects?
AF: This is a summary report, but yes there does need to be documentation of assumptions used in the SPASMO model.

Discussion summary:
We need an outline of modelling assumptions and hard data to back these up.

Review of current land use leaching map, graphs of annual modelled nitrate losses and flow net-leaching maps.

- AF: Recent groundwater samples show nitrate levels are dropping, but the management challenge is whether this trend will continue if there is more irrigation and/or land use change. That depends on our assumptions about future scenarios.
- AF: The flow net leaching maps show the likely change over time if irrigated market garden use increases within the area suitable for market gardening identified earlier with Pierre. This took into account limitations to market garden conversion of minimum lot size, excludes areas with existing permanent crops (e.g. apples, grapes, orchard), and climatic limitations for market garden.

Why are there hotspots developing over the flow tube mapped scenarios?
These areas are all converted to market gardening and are on the leakiest soils (eg Ranzau). The redder cells have higher average nitrate loss than lighter ones.

Some areas are changing from orchard/vineyard crops to market gardening so is that assumption suitable?
AF: Previous discussion suggested land use change is more likely from pastoral or lifestyle blocks than from permanent crops so this was one of the assumptions made.
DC: It is likely that pipfruit will be going the other way and increasing in the future.

- MAB: MPI have been doing work (expanding on Landcare Research's work) looking at the economics of irrigation and nutrient management – the Landcare Research report for MPI should be public shortly and MAB will send copy to FLAG.

Action: *MAB to send MPI report to FLAG.*

- AF: For MPI, we have also looked at the scenarios assuming irrigation water availability limited by the current No-Dam rules proposed in the TRMP. On an annual basis, varying the amount of irrigation (between No Dam rules and With Dam rules) on an irrigated crop makes little difference to annual nitrate losses because the nitrate leaching is driven mostly by winter rainfall levels.

- AF: With the flow net leaching work we have looked at average loads over each flow net cell and determined the impacts of the flow tubes on the receiving water bodies by summing the losses along the flow tube cells, assuming no attenuation (loss of nitrate) once the nitrogen gets into the aquifer(s).
    - We have compared the calculated results with measured nitrate concentrations from the past 3-4 years. Results show a good match for Pearl creek, but higher predicted nitrate concentrations than recently measured for Neimann creek (though similar to past higher concentrations).
    - JT: The actual sampling results are affected by the changing location of the sampling with sampling closer to the coast coming up with very different levels.
    - We've then redone the calculations for the various scenarios of increasing market gardening described above. The results show how much the nitrate concentrations in Pearl and Neimann Creeks might go up under the different land use scenarios.

- MAB: The most important aspect to consider is the general trend, rather than the specific numbers - the results show that with increased market garden the nitrate levels don't go up markedly.

- AF: The annual nitrate loss graphs for market gardening show the biggest impacts from winter cropping.
  - This can be significantly affected by practices used.

- AF: There are benefits to winter cropping as growers get the benefit of the micro climate in the Ranzau soil areas, and can sell to markets when others are unable presumably at a higher return.

- MAB: We have not looked specifically at the drinking water standards in the flow net cells with higher leaching.
  - AF: No we have not done this yet, but could. *[Based on the accumulated nitrate values down the flow tubes being less than the drinking water limit of 11.3 g/m3, the current (as opposed to historic legacy) nitrate losses don't look like they'd breach drinking water limits].*

So if we have a dam there will be significant dilution [of groundwater nitrate from recharge flows] from the river.
AF: For aquifers affected by river recharge, yes – in particular there will be dilution right through the drier summer months. For the confined aquifers north of Burkes Bank there is minimal river recharge though.

Session 3: Management approaches - land use and nutrient management
Presentation and group discussion on Policy Options – led by Mary-Anne Baker

MAB: Under a No-Dam scenario we have increasing water restrictions and less irrigation – this has unknown implications for land use change and subsequent leaching levels.

People might look at novel approaches to storing water.

I think there will be more efficient use and possibly more use of fertigation [fertiliser in irrigation water].

Does fertigation get applied to the top of the crop or the side?
Most pipfruit and crops would use microjets or microsprinklers under the crop, but other areas may use drip systems.

JT: There are some instances of fertigation in Tasman currently.
There is better technology available now to allow greater uptake of fertigation

What are the impacts of urbanisation on nitrate? If there is no water, urbanisation may end up a viable use.
We wouldn't expect urbanisation to elevate nitrate levels – although elevated levels have been seen in Borck Creek which is partly urbanised.
There are possible urban nitrate sources from garden fertiliser.

TJ: we saw lowering nitrate levels in Borck Creek with the removal of a local truckwash, but since then the levels have increased back up to the previous high levels (higher than in Neimann) – we have tried to do source monitoring, but have not had any conclusive results.

They have done work in the channel in Borck Creek where they have dug the stream out – we need to be careful about determining the source of nitrates – it could be the small drains from the eastern parts of the catchment behind Richmond draining into

Borck Creek, rather than from upper parts of the catchment in Waimea-West as there is very little actually flowing in the creek at these upper areas.

Sampling is from the lowland groundwater-fed reach.

We might also see an increase in smaller lifestyle blocks.

MAB: We may not need different management for the With-Dam and No-Dam scenarios as the issues are largely the same.

With the dam – we will have more irrigation and have more intensive land use – this makes the with-dam scenario more predictable than the no-dam scenario.

I think we will see expansion in horticulture rather than dairy based on current prices. However we may see other new crops coming in such as feijoa. Pierre has indicated that market gardening won't increase significantly so that only leaves other crops.

I don't see vegetables growing much due to lack of export opportunities, but other crops have these available.

MAB: We need to make some decisions before we can decide on a policy response:
- Do we need to claw back?
- Do we allow additional N loss?
- Do we cap nitrate leaching at current loads, and if so is this done at a catchment scale or at a property scale?

PW: There doesn't seem to be an argument for clawing back from recent discussions as the numbers suggest we have some lee-way.
MH: I'm not sure I agree with that.

There needs to be consideration of a catchment budget and this is then allocated at a property scale within the catchment.

Don't we have to look at what the triggers/goals are and where we are at?
MAB: Yes, we have done this and we are in the 'A' grade for nitrate toxicity.
So we just need to focus on status quo?

AF: We need to consider each water body separately as they have differing issues.
If we tick off the coastal area, we don't have a toxicity issue in the springs, but we do have periphyton issues to address in the springs, and have legacy exceedances of drinking water standards in some confined aquifer bores.

TJ: We can't ignore dissolved reactive phosphorus (DRP) concentrations in the spring-fed streams as once these are over 0.01g/m^3 then it won't be P limited and with N0$_3$-N concentrations already well over 0.4 g/m^3, this means that there is no nutrient limitation. Without a DRP limit periphyton growth has little control.
JT: Yes but the river levels of P are low, so where is it coming from – is it from adjacent land use?
[TJ: Currently, DRP in spring-fed creeks are over 0.01g/m^3 about 40% of the time. The concentrations are not way over, but if it gets much higher, then we really do risk much greater filamentous green algal growth. The source of the P is probably from stores in the sediment.]

MAB: Different methods of Nitrate Allocation are being used around the country including:

- ***grand parenting,***

- ***natural capital (LUC) based allocation,***
- ***catchment load per ha,***
- ***property allowances based on land cover or sector average, and***
- ***soil based nutrient vulnerability.***

MAB: Lessons from California highlight the need to avoid complex regulation based on such complex systems (too many arrows)
The use of OVERSEER represents all the arrows in the system

Do we need to go to a property scale – could it be on a sector type? If some are over leaching others will not and balance overall leaching for the sector.
ML: This might work until you start reaching your limits – this was a problem in Hurunui.

Do we look at patterns of land use and their respective leaching outputs and divide this up to use as guidance as to whether we will meet limits and to act as thresholds for further action to be taken?

Do we go to a market based approach – if we set the limits and leave it up to the users to manage to the limit?
MAB: We could, but we would need some idea of property allowances.

The downside is this may lock in some land use types in – eg those that currently are low-leaching – we need to make sure we retain property flexibility.

I don't think we're in a situation where it would need to be that constrained – we have room to manoeuvre.

A property scale system also requires a big administration system which is a cost to Council/ ratepayers.

Do we look at gaining more data on current practices and ensure landowners are doing good or best practice?

We could get data for nutrient leaching as we do with water metering.

How do we implement/achieve improved land use practices?
If we utilise existing industry regimes –such as Fonterra- if these were approved by council then education and support could occur within the industries themselves**.**

This could also work in the pastoral sector.

In most systems now we have a mix of voluntary and regulatory systems

I think this will depend on where specific industries already are such as those operating under GAP programmes. I think we need to understand good industry practice on the smaller or newer crops as these aren't covered by industry programmes and we don't know as much about them. For example we need to more about fertiliser programmes for these.

If landowners have a nutrient management plan and an irrigation management plan – then that covers the two key aspects we are seeking to manage.

As long as we accept the processes already in place – many landowners already have to provide these plans for other groups - eg for fertiliser companies - we don't want to add requirements for more plans on top of existing requirements.

Management planning represents the voluntary approach – and if this is not chose n then the regulatory aspects kick in.

Given the bigger suppliers would be subject to export Gap type systems, is it worth the cost to Council to pursue those smaller growers growing for the road side sales?

Are we saying that those that don't irrigate won't have to provide plans?
No, we're not saying that, as we have shown irrigation is not the key driver, but land use that comes with irrigation could be.

We could use the trigger that if growers don't already belong to a GAP type scheme then they would have to provide the necessary management plans to Council.

How is the use of OVERSEER working in Horizons?
They are finding great difficulty in management compliance due to the variations and version issues associated with OVERSEER.

Does the global gap require some kind of OVERSEER input?
DC: Yes, you need to be able to put in inputs. But it may not be to the level of detail needed to determine losses

I find OVERSEER really useful in assisting farmers to identify practices that are not performing well – benchmarking of practices, however I would not use it to set a figure that the farmers then need to aim for.

AF: They have indicated they will be seeking to charge users of the OVERSEER model.

MAB: We could look at higher performance standards or leaching specific to Ranzau soils – currently all soils are treated the same.

I think they are already considering water use differently due to limited water holding (and nutrient holding) capacity – I think we do need consideration of leakier soils.

Did the modelling show different effects of irrigation types on Ranzau soils?
The model didn't look at this, but it is observed that irrigation types such as drip irrigation is not used as the water just goes straight through.
AF: Our work for MPI did look at irrigation efficiency of various systems.

Are the drivers for consideration of this due to GAP requirements or from financial drivers for economics?
We need to consider environmental impacts, but there are no specific levels to be met – so it is largely economic driven.
We've heard that in the period leading up to harvest some growers are putting on as much water as they can – regardless of leaching considerations.

If we have the right parameters in place the economics will drive the necessary land use patterns.

We have further ability to use differing irrigation practices – compared to some used overseas to improve water efficiency.

If fertiliser use on the Ranzau were done in one hit there would be large leaching – we need to look at best practice around fertiliser use – eg it might be more effective to use fertigation than using solid fertilisers – we need better understanding of what can be done.

Do we need to understand the impact on production for such changes?
Work done by HortNZ on this and it made little difference to outputs.

The industry needs better research on types of fertiliser, timing and size of applications. Part of the GAP programme is justification of practice choices – I'm not sure this is currently done in the vege growing industry.

This is because they haven't been pushed to focus on nitrate leaching as an influencing factor.

Fencing and riparian management might be some low-hanging fruit.
Yes, particularly in the upper catchment areas with pastoral farming and around spring-fed streams. But this controls phosphorus more than it does nitrogen loss.

MAB: So we have direction for further work to look at irrigation and N application and timing considerations for Ranzau soils.

It might only be a section of the Ranzau soils we need to look at – those affecting specific receiving environments.
This would add a layer of complexity.

MAB: Other approaches include reticulation for managing drinking water and pumping clean water into the springs to dilute nitrate levels.

Summary – further work to look at:

- Land use rule and performance rules for leaky soils
- Provision of nutrient management plans and irrigation management plans
- Review existing industry auditing programmes to see if these are appropriate for our use in reporting what we need to have as outputs.
    - With consideration of how the council audit can be included in the process – eg by providing a copy to the councils
    - There may be national codes that might need to be added to, to fit our local conditions.

MAB: Do we need some conversations between FLAG members and industry groups to discuss local performance standards and how this is reflected in the land use rules? Also what are the good/best practices for each industry sector?
General agreement this was a good approach.

Dairy is moving towards combined farm environment plans that look at all aspects and includes a grading of where practices are at relative to good and best practice with an indication of what farmers need to do to move upwards. These plans clearly define what is good and best practice is (e.g. ECan's Matrix of Good Management approach).

The pipfruit industry is heading in a similar direction – seeking gradual improvement.

Pastoral livestock industry has not been driven by the same market drivers so they are behind other industries. Beef and lamb are moving to catch up with other industries.

Flower growers also don't have industry regulations. There will be other smaller or emerging crops that don't have these systems in place which we will need to help provide systems to improve their practices.

Do we then have limits that are more lenient initially and slowly tighten up to allow for smaller growers to comply over time?

We don't want them going backwards, but we want them to improve.
I think we shouldn't lower the standard, but provide more time for growers to get there.

We could outline the limits we want to obtain and then look at the various industry programmes (eg GAP) to see how they will provide for this.

How do we structure a land use rule that reflects both risk and how mature industries are in achieving best practice as well as consideration of soil types?

Doesn't a management plan differ for Ranzau soils than on other soils?
But if we don't stipulate what they have to do differently they will remain the same.

Have we adequately stated the outcomes we want rather than the rules? – these could be achieved in a number of ways?
What kind of outcomes are you thinking of? - at the moment our outcomes are based on receiving environments – if we go down this route we come back to having to set limits at the property scale with the inherent issues.

Unless we put a number in the Plan, it is left up to the farmer and their advisors to determine what to do on site.

The rule would be that you have to have an industry audit plan, otherwise you are then a consented activity.

And if the rules have a requirement that these plans show a specific leaching limit for the property... ?

But this causes issues - we want OVERSEER to guide best management practice, but not drive leaching numbers.

The current use of OVERSEER drives better use of fertiliser and timing of applications which is what we want as an outcome.

We will end up with the same amounts of nitrate leaching across different soils, but growers will be doing different things to achieve this on different soils.

At the end of the day it is still up to farmers to do the right thing.

We can only audit so much.

We have to write rules that encourage people and educate them that following the rules is economic.

Unless we do an awful lot of monitoring at a property scale, we won't be able to prove landowners are undertaking the good practice they claim.

Council will still be undertaking their monitoring and we will get warning that issues may be arising.

There is a lag time between something being done and the impact in the receiving environment - do we also need thresholds and sentinel monitoring of certain rules to act as a trigger for further action upstream?

Glenn S has started looking at this and the nitrate levels in some areas fluctuate a lot. But in other areas nitrates are trending down and if this trend changed it would raise the alarm.

We need to make sure we are monitoring in the right places.
Do we have the ability to monitor in the right places [eg access]?
TJ: We began monitoring in Neimanns and Pearl creeks in 2013 *[in response to the greater concern about nutrients in these rare ecosystems. We now have nearly all the streams covered. O'Connor would be the only other spring-fed creek not covered but that dries up for many months for most of its length so the values are much lower.]*
AF: We need to go through identifying areas of issue and start with limits and set lower thresholds for triggering action.

Do we have adequate sentinel wells in the leaky soils?
How do the current wells represent the flow tubes?
TDC sample selected wells every 3 months and monitor a wider set of wells every 5 years – we have a three dimensional system to monitor.

How much is a nitrate sample – are landowners doing this already?
Nitrate alone is only just over $5/sample (we currently get a 50% discount), but it costs $51 each sample for the full suite of nutrients.
Nitrate sampling is already a requirement of the GAP programs.

Should we still add costs to individuals if the council already has a monitoring network that gives a representative indication [of nitrate levels]?
If we do a review of the council network we could add information from those already monitoring for industry programmes to build a bigger picture.

We could start with triggers in the council sentinel wells and then if these are triggered, then further review of private wells could be done.

We would need to consider access and suitability of any private wells used.

We should focus on grower provided data, rather than council gathering.

Part of our problem is the hotspot areas – our current sentinel wells are showing a decline in nitrate of the last 20 years, but not all these wells are around the hot spot areas.
Review Figure 10 of Landcare report (page 15) – the WaiWest well has shown a marked increase in nitrates, however this may not be related to WaiWest activities, but land uses 'upstream' of the bore.
We need to be careful of how we use bore information as it can be affected by all sorts of factors. This shows the importance of mapping land use and land management practices to link cause and effect.

We need to be looking at patterns rather than specific single results.

Can nitrate be measured and telemetered in real time?
Not yet, but scientists are working on this

Summary of morning group discussion

- *FLAG gave direction to look at rules in plan, rather than a property scale nutrient limit approach*
- *Need to have relevant FLAG members liaise with their respective industry groups regarding existing auditing programmes and whether they are suitable for council use also – including:*
    - *Beef and Lamb – Gavin O*
    - *Fonterra – Mirka L*
    - *HortNZ – Dennis C and Pierre G*
- *Any other industry groups?*
    - *What about flower growers?*
        - *Need to have a look at the extent of emerging crops and smaller growers to see if these warrant being looked at.*
    - *Wine growers – someone from each of the sustainable and organic schemes – Philip W can organise this*
    - *Pipfruit NZ or KiwiNZ – Dennis C?*
    - *Deer farmers – Gavin O?*
    - *Goats (Gary Batten industry rep)?*
    - *Alpacas, llamas, chicken farming, etc??*
- *FLAG members to discuss audit programs with industry groups and feed info back to MAB as it is received to allow iteration of the process.*

It would be helpful to have some information on what consequence would be if landowners didn't meet industry standards...
They would then enter the regulatory framework and require consent.
We also need to focus on building industry.

Staff could begin work on the land use policy framework to show how it could look.
Agreement this would be helpful.

How do we deal with lifestyle blocks that might have a higher number of stock? - Do we have a threshold after which they need to comply?
We could have performance standards that apply regardless of land use eg stock in water courses.

Action: FLAG members to discuss audit programs with industry groups and feed info back to MAB as it is received to allow iteration of the process: sector responsibilities identified as:

- Gavin O = Beef and Lamb, Deer
- Dennis C and Pierre G = HortNZ, PipfruitNZ, KiwiNZ
- Phillip W = wine growers (sustainable and organic schemes)
- Dennis/Gavin? = Goats via Gary Batten
- Mirka = Fonterra
- Dennis C = Other sectors (eg alpacas/lamas, chicken farming, flowers)
- Heather A = Forestry

Action: MAB to develop draft policy framework and send to FLAG.

Session 5: Project Management

Subsequent meeting dates

Next meeting dates agreed:
30 September date removed due to time constraints

- *Monday 23 November 2015*

Action: Staff to send out electronic cancellation of September date and invite to November meeting.

Consultation

PW: Mary-Anne are you suggesting we need to do a further round of consultation?
MAB: We've learnt a lot of stuff and this should be summarised in a page. This information could be useful in the wider dam debate. Feedback from the last Waimea plan change highlighted concerns relating to the impacts of the dam to nutrient leaching and water quality.

We also need to communicate the importance of the flow in the river – some people are seeing it as being wasted, rather than understanding the importance to aquifer recharge and aquatic ecosystem health.

> *PW: I always thought that the with-dam would result in worse nitrate, but with the dilution I now understand this is not the case (not everywhere anyway) and leaching will be easier to manage in a with-dam situation.*
>
> *This will need to be carefully communicated.*
>
> *We should have another article with the Nelson Mail at the same time as putting the summary of information on the webpage [and Newsline].*
>
> *Some will only read the absolute basics - we need some clear one-liners to ensure people will read them. And have further detail on the website to back this up.*

Can we get executive summaries for the reports as they are getting rather long for reading?
AF: yes we can put in short summaries.

And use basic English language

And ensure grab points are based on fact, not assumptions.

Sector communication would be good to target stakeholders, as not all media avenues work.

Have we published anything to the LAWA site?
Not specifically relating to FLAG. But Council monitoring information is available on there.
Action: MAB to talk to Chris Choat about what can be put on the LAWA site.

Do you have any input into the Chamber of Commerce? This could be a good way to start discussions in the sectors.
Agreement this would be a good idea.

<end of meeting early at 1.30pm>

Action Points – Council Staff

No.	What	Who
1.	MAB to send out copies of feedback and staff summary to FLAG.	MAB
2.	Staff to update tonnes/yr estimates with recent SPASMO information.	MAB
3.	Staff to work out concentration for coastal threshold and advise FLAG.	JT
4.	MAB to send MPI report to FLAG.	MAB
5.	MAB to develop draft policy framework and send to FLAG.	MAB
6.	Staff to send out electronic cancellation of September date and invite to November meeting.	MAB
7.	MAB to talk to Chris Choat about what can be put on the LAWA site.	MAB

Action Points – FLAG members

No.	What	Who
8.	ML to provide production and dry matter data to AF.	ML
9.	FLAG members to discuss audit programs with industry groups and feed info back to MAB as it is received to allow iteration of the process: sector responsibilities identified as: • Gavin O = Beef and Lamb, Deer • Dennis C and Pierre G = HortNZ, PipfruitNZ, KiwiNZ • Phillip W = wine growers (sustainable and organic schemes) • Dennis/Gavin? = Goats via Gary Batton • Mirka = Fonterra • Dennis C = Other sectors (alpacas/lamas, chicken farming, flowers) • Heather A = Forestry	GO, DC, PG, PW, ML

Next meeting

Date	23 November 2015 (Meeting 11)
Time	9.30-3.30pm
Venue	TDC Council Chambers
Chair	Philip Woollaston

Subsequent meetings - None booked – likely to be 2016.