TAKAKA FLAG MEETING 16 NOTES:
29 January 2016

Purpose:	Takaka Freshwater and Land Advisory Group (FLAG)– Meeting 17
Date:	29 January 2016
Time:	9.30am-3.00pm
Venue:	Takaka Fire Station
Present:	**FLAG members:** Graham Ball (GB) Mike Newman (MN) Mik Symmons (MS) Piers MacLaren (PM) Neil Murray (NM) Greg Anderson (GA), Andrew Yuill (AY) (co-opted member) Martine Bouillir (MB- council representative on FLAG) Tony Reilly (TR), **Staff:** Lisa McGlinchey (LM – Environmental Policy Planner) Joseph Thomas (JT -Resource Scientist - Water & Special Projects) Steve Markham (SM – Environmental Policy Manager) **Other** Rochelle Selby-Neal (RSN -Independent Facilitator) Andrew Fenemor (AF – Landcare Research)
Apologies:	Mirka Langford (MLa), Kirsty Joynt (KJ), Hika (Matt) Rountree (HR), Margie Little (MLi- iwi representative on FLAG) Trevor James (TJ- Resource Scientist – Water Quality & Aquatic Ecology)
Notes taken by:	Lisa McGlinchey (supplemented by other staff)
Definitions and Abbreviations	FLAG = Freshwater and Land Advisory Group NPS-FM 2014 = National Policy Statement for Freshwater Management 2014 NOF= National Objectives Framework – under the NPS-FM TRMP = Tasman Resource Management Plan (the Plan) TWMC = Takaka Water Management Catchments SOE = State of the Environment WCO = Water Conservation Order application for Te Waikoropupu Springs and recharge area AMA = Arthur Marble Aquifer TLA = Takaka Limestone Aquifer TUGA = Takaka Unconfined Gravel Aquifer MALF = Mean Annual Low Flow TWS = Te Waikoropupu Springs l/s = litres per second
Note: records of discussion points have been grouped into similar topics and are not necessarily in the order discussed at the meeting. Notes in square brackets [ ] have been added post meeting for clarity.	
FLAG MEMBERS PLEASE NOTE: If you have any questions or need anything between meetings, then please contact Lisa McGlinchey by email: lisamc@tasman.govt.nz or by phone ddi 03 543 8409.	

Purpose of Meeting

- Consolidate group approach for 2016
- Project Management – understand the timeframe, key tasks and milestones
- Nitrates – summarise the scientific information available
- Monitoring
  - Review and complete any discussion on monitoring for nitrates in TWS
  - Address where monitoring fits into FLAG outputs and TDC work plans.
  - Review monitoring needs with respect to values, attributes, threats and risks
- To review the key water quality issues of concern across the catchment and their causes and effects (providing context for water quality decision-making).

Welcome and Karakia

RSN welcomed the group. RSN led the group in the Karakia.

Check-in

RSN asked the FLAG for any issues they would like to raise in the check-in session:

AY noted that in setting up a more frequent monitoring programme for nitrates in the springs, he has been visiting the springs more often and has particularly enjoyed this experience. He noticed the rain had washed had washed away old green slime in Fish Creek, but some brown water was discharging off land up from fish creek springs. It is a very emotional place for Andrew – the importance is about the mauri of the springs.

GA: I've had very powerful emotional experiences at the springs. I'm keen to present information on nitrates information I've found.

PM: I'm surprised at how long this process is taking and I expect there are some frustrated landowners. **Is this the case Tony?**

TR: Yes, there are. They are disappointed how long it is taking. Now questioning where they are, given iwi objections in light of local iwi support.

MB: It can be easy to lose touch with the physically of the springs sitting in a room. Perhaps the group can visit the springs again.

MS: I've been visiting Wainui falls - was able to step over it in dry weather, but after rain it was huge again. Anatoki was reasonably clear of algae, but after it comes out of the gorge and the stream is wider and shallower and not as much shade there is quite a bit of periphyton (periphyton is up in the national park too). The temperature was warmer than I've felt elsewhere – feels this is likely to be affecting the periphyton levels at Paynes Ford.

JT: It is quite natural, it is easy to assume there is something happening to cause it, but it is in such a big exposed area. Periphyton can happen in pristine areas with the right conditions.

TR: Swimming holes in the Waingaro seemed reasonably good before the rain, it seemed warmer than normal, it seemed the didymo (if that was what it was?) was spreading up the river.

MB: The Te Kakau stream has become disgusting. What are we doing about it?

GA: I think Trevor has run into issues with landowners not being too keen on planting shade trees.

LM: This issue came up during the Takaka Flood Hazard Project in the Community Board recommendations to the EPC. The Council acknowledged this was a project that needed to be driven from the community given the private land ownership along the Te Kakau.

The Takaka Catchment Management Plan is programmed for 2016-2017 – this is an opportunity to look at this and other streams or channels in and around the township.
AF: Trevor has trialled shade cloth in Te Kakau and had some great success in controlling plant growth.

Some people didn't like the visual impact of this blocking their view of the water.

TR: A commercial eeler from out of the district has been operating locally.
NM: he is only taking a certain size and leaving the big ones.

RSN refreshed the group on the meeting behaviours in preparation of work over 2016.

Session 1: Updates

Overview of Summer Conditions

JT gave an overview of the summer conditions experienced in the Takaka catchments:

Key points:

- Behind the total average rainfall by around 27% - dry-ish late spring
- 2 bouts of rain after new year, first one didn't do much, but second one boosted system
- Cobb dam had very low storage (low 20%) and were not releasing much water and the Upper Takaka irrigators where 'cease take'd for a longer period of time than normal.
- Te Waikoropupu springs dropped as the Takaka River dropped (none of the Upper Takaka irrigators were taking water at this time).
- Fish creek spring was dry
- Anatoki just got below MALF – around a 1 in 3 year drought.
- Waingaro just got to a little bit below MALF
- Kotinga just got below MALF
- Groundwater hydrographs showed that the Takaka Unconfined Aquifer (gravel aquifer that supplies the town) were the lowest ever measured over the 16 years of data recorded. However, the water level is still only 3.3m below the ground and there shouldn't be any issue with surface pumps.
- The springs flow was also the lowest flow recorded since 1990
- The rivers never got to the position where the FLAG had suggested that the DWTF consider S329 restrictions.

RSN: Does the Cobb flows affect the Takaka Gravel Aquifer?
JT: We haven't correlated it specifically, but we think there might be a small impact of less water getting into the gravel aquifer due lower river levels in Takaka River.

GA: What is the lag time between the responses in the Springs and the Takaka River?
AF: It is a matter of hours, not days. It is a pressure system so there is no delay. It is like a filled hose, it gets turned on at one end and comes straight out the other.

NM: Is this an El Nino affect? Do we have data from other El Nino years?
JT: We have data from 1997 which was the last El Nino.
AF: 1982-83 was also another, but what we are seeing is largely an impact of Cobb dam not releasing water.

GA: Is the Cobb dam full now?
JT: The are at 36% as of last Monday.

Dry Weather Task Force Recommendations

JT gave a brief overview of the recommendations made to EPC about the DWTF decisions over summer:

Key points:

- Mik made a good presentation to the EPC meeting about the DWTF using S329.
- The EPC agreed to have Corrigan Sowman on the DWTF to represent irrigators in Takaka when decisions are being made during dry weather in Takaka catchments.
- *MS: There was a positive response from the EPC, but it reminded me we are working in a political environment and need to keep this in mind in making our recommendations.*

Irrigation Group and Farmer Liaison

- *TR: The irrigators are aware that S329 orders may be used in the future.*
- *JT: The Council had a good meeting with the irrigators late in 2015 and the irrigators were accepting that there needed to be allocation limits and rationing and cease take triggers, but they are keen to have certainty.*
- *TR: They are expecting changes to come in in 2019 with some interim process until then, such as S329 to manage water issues.*
- *RSN: Mirka has been meeting with individual farmers and is taking the opportunity to talk to them about the FLAG process so they are all aware.*

Community Update Document

MS gave an overview of the progress to date on the community update document:

- Consultation subcommittee has been working on the community update.
- Kirsty put together a draft and the subcommittee reviewed this.
- It was then put to Beth Catley at TDC (online communications officer) to review as someone not involved in the process – this shortened and reorganised the document.

RSN: It will be sent out to FLAG hopefully next week to review with photos added.

Action: RSN/Mik to send out final draft of community update document to FLAG.

Resource Consent Applications

RSN highlighted that the FLAG should avoid spending too much time discussing active consent applications that the group can't do too much about, rather than focussing on the process FLAG are seeking to put in place.

MN: If a consent is processed before the FLAG is finished it sets a precedent for others if FLAG are then seeking to set the bar higher. Other applicants will want to be addressed under the same conditions as others.
SM: The outcome of either of the consent processes does not present an impact on the FLAG process.

Kahurangi Virgin waters

SM gave a summary of the situation:

- The Virgin Waters application is not a new consent application – it is seeking an extension to an existing consent to avoid the consent lapsing as it has not yet been exercised.
- It is a two-party process between the council and the applicant, however from conditions placed on the consent during previous extensions, there must also be consideration of affected parties and iwi (Ngāti Tama ki te Waipounamu Trust) have indicated they oppose the take.
- *JT: The take is from the Confined Marble Aquifer, but not from the springs recharge area.*

- *RSN: The take has been included in the allocation considerations made by FLAG previously.*

MN: There is an expectation [with permits] that "you use it or lose it" – is this not happening in this case?
SM: There are tests that must be met to allow extensions, however I can't comment on the status of the process.

AY: I think that the take of 6.5l/s is about 4000tonnes of water per week and I have concerns over the effort/activity of moving this amount of water from the bore to where it needs to be.
SM: The take permit and bore consents stand on their own – they do not include any consideration of how the water would be moved. If there was to be some on-site bottling plant it would require a separate consent.

MB: … and if they are just taking it away by tankers?
SM: It would be a permitted activity.

MB: There is a concern from locals that it would be publically notified.
SM: If the extension is given, then the consent holders will need to think about how they are going to go about exercising the consent. [If the extension is not given, the consent will lapse on the 22 Feb 2016, if it is given, the consent will continue to expire in 2019].

RSN: If anyone else has further concerns they should discuss this with the TDC consents officers.

MB: The extension comes about through the difficulty in logistics of getting the exercise of the consent developed. It would be a benefit to the Bay in creating jobs etc, however it is a long term project.

AY: Graham, would you like an opportunity to talk to the FLAG about what the company is planning to do?
GB: I don't know if it will proceed or not, but it is not intended to have a bottling plant on site.

<u>Gunsboro Application</u>

- The consent was granted by Council, but has been appealed by Ngāti Tama ki te Waipounamu Trust. The essential ground for the appeal is to ensure there is no impact on the relationship of Ngati Tama and the Springs.
- There will be a mediation process as part of the standard appeal process.
- Ngati Tama will need to provide further information on their grounds for appeal as part of this process.
- *RSN: This will be similar to the process that FLAG will be going through – which will hopefully be mediated through the FLAG process, but if not, in the formal plan change process that follows.*

TR: The consent was only granted to 2019 to align with the other local consents – my understanding was that the local iwi supported the consent.
SM: Yes, Ngati Tama has members living locally and outside of the Bay, however it is the Ngāti Tama ki te Waipounamu Trust that has appealed the consent.

MS: Is there another application that has been received recently?
JT: I have heard there may be an application regarding use of existing storage water, so it won't affect water levels - but I haven't seen any details as yet.

Session 2 – Project and Process Management

Overview of timeline and key milestones (Lisa McGlinchey and Steve Markham)

RSN, LM and SM went over the proposed 2016 timeline; three options were proposed:

1. Prepare a draft plan change by 1 Sept 2016

- Not considered achievable due to constraints in staff capacity and timeframes needed for iwi and public engagement.

2. Prepare a 'Solutions Package' – with consultation – by the 1 Sept 2016

- Solutions package would outline the issues, objectives and preferred management approaches with plan change drafting instructions – staff would then prepare the draft plan change for FLAG approval after 1 Sept 2016 (eg given of the Sth Canterbury ZIP document)
- Considered more achievable than option 1, but still concerns over constraints in staff capacity and timeframes needed for engagement.

3. Prepare a 'Solutions Package' – without consultation feedback – by the 1 Sept 2016

- Considered more achievable than option 1 or 2, but concern that this would move community discussions to the back end of the process.

RSN provided a month by month summary of tasks based on Option 2 to FLAG.

Action: LM to send out Canterbury ZIP example document to FLAG.

RSN: We picked up that the EPC would prefer to have information drip fed to them through the process rather than a lump at the end, and they would be keen to have a say in the direction of the output before it goes out to the public, Option 3 this would allow this to occur.

<morning break>

Discussion arising from presentation:

Action: FLAG to go through project timeline and think about which option they want to proceed with.

RSN: Things for FLAG to consider:

- *Dropping the public open day and just having one round of public consultation looking at the issues and options a bit later in the programme.*
- *Can still put out consultation document as planned*
- *AF is suggesting we need to include more detail in the consultation update to encourage engagement from the community – it is perhaps too vague at present about the implications of the decisions being made.*

MB agreed with AF and suggested adding questions to the community update would be useful.

Action: RSN to review community document with AFs & MBs comments in mind.

AY: How is feedback gathered?

RSN/LM: It is typically written feedback, but with open days we can also gather information from topics discussed on the day, but this is more informal and qualitative information.

SM: There are three aspects to feedback:

- *Relevance –some feedback won't be relevant to FLAG's task.*
- *Quality (probity) of the feedback*
- *Quantity – how many people said this.*

MB: The FLAG members have been given this mahi and it is our job to come up with what we think is a reasonable solution – which may not necessarily align with the majority community view.

MB: I discussed what happens if the community is divided with other Councillors. The feedback was if the FLAG was solid about their solutions – then the council would go with it. But what would undermine this was if FLAG members didn't stand behind their decision after it goes to council and different members began promoting different opinions.

RSN: How do people feel about more meetings?
Not all the dates will suit.

Action: LM to send out invites to scheduled FLAG meetings (including EPC workshop on 23) and the tentative meetings proposed.

TR: Can we progress discussions with iwi sooner rather than later?
SM: I am in progress of discussions about a time for a meeting prior to the 23 March.

Action: SM to liaise with iwi and advise FLAG of hui date(s).

Action: RSN to follow up with FLAG via email regarding the consultation update document.

FLAG Decisions to Date

RSN/LM went over a draft summary of FLAG decisions to date, highlighting decisions still to be made and issues still to be covered.

Action: LM to send FLAG the draft Summary of FLAG decisions (Solutions Summary).

Group discussion:

RSN: How is everyone feeling about the project management information presented so far?

MB: I value the time and effort the FLAG members are willing to put into this process to achieve an outcome.

RSN: I am conscious that tight timeframes can restrict discussion time, which can make getting a consensus outcome more difficult – however if the group can't come to a consensus on an issue – these options can be put out to the wider community for feedback.

RSN: If FLAG members find themselves with opposing views, it can be useful to discuss these with those with opposing views to them, to help each other understand each other's viewpoints.

GA: Could we look at the summary table and provide feedback to find out where there is agreement and which issues we need to focus meetings on?
General agreement this was a good idea.

Action: FLAG to review solutions summary table and feedback on areas of issue to Lisa McGlinchey.

AY: It is important to undertake iwi consultation thoroughly as this is an important part of the process. Public feedback is also important. I am concerned that FLAG may be moving too far from public perception and we need to understand where public perception

is at and how to incorporate this within the process. I circulate within a like-minded group and I am conscious of whether I understand the opinions of other groups.

RSN: FLAG members such as Greg have been going out to the wider public and discussing issues with them. It would be good to have a process that collates the feedback received from these discussions to get them into the process – would those talking to the wider community be keen to do this?
MB: Yes, I would be keen.
No dissention from other members present.

Action: FLAG members who have been discussing water issues within their respective circles to summarise key issues/topics/questions raised and feed this back to Lisa McGlinchey as bullet-point emails.

MB: Social media is also an interesting source of wider community and national discussions on water issues. How much of this kind of information should be forwarded to the rest of the FLAG?
RSN: If you are building up knowledge around national and international trends that you think are important to the group – then this would be good to summarise and send around to members.

AY: There are some miscommunications in the community and people don't understand the science around the issues.
RSN: If there are miscommunications in the community – the FLAG can address these with specific targeted articles in the paper.
AF: We need the questions identified so we can provide the answers.

Action: FLAG to forward issues they think are misunderstood in the wider community for consideration for communications clarifying issues.

MN: Is there any progress on replacing Mary-Anne Baker?
SM: We have re-advertised the position and this closes mid-March.

Session 3 – Nitrates: science summary and monitoring

Nitrates – science review (Tony R)

TR gave the FLAG a summary of work being proposed by the irrigators group.

Key points:

- Following the last two lots of irrigators meetings there was some concern in the group that there was some conflict arising between the nitrate scientists.
- The irrigators group has approached Dairy NZ to arrange getting scientists together to get a consensus output.
- Mike Scarsbrook at Dairy NZ is contact person for this work.
- Timeframe is hoped to be 2 months (report received at end of march)
- Scientists involved include:
  - Roger Young (Freshwater Ecologist with Cawthron)
  - Chris Hickey (Eco-toxicologist and Environmental Chemist with NIWA)
  - John stark (Macroinvertebrate and Plant specialist with Stark Environmental)
  - Graham Fenwick (Ecologist and Crustacean Systematist with NIWA)
  - Graham McBride (Water Quality Statistician with NIWA)

[JT is also recommending that Magali Moreau-Fournier from GNS is also involved in discussions of the nitrate data.]

Discussion arising:

PM: What aspect of Nitrate is being looked at?
TR: Regarding the guidelines and which should apply in Takaka.

TR: Also there is a small amount of work looking at economics of dairying in Takaka, looking at cow numbers, etc.

AY: Will the economic info be published?
TR: It will be made available to FLAG, but this is less progressed than the nitrate work – still waiting on brief from DairyNZ.

RSN: Would it be worthwhile taking any questions the FLAG have to the scientist group?
TR: Yes, very much so, and including in the brief the hydrology involvement from TDC.

MS: We've had discussions highlighting that increased irrigation is often used to increase the consistency of supply, rather than intensification with more cows…
TR: With irrigation you can grow more grass in summer during dry periods so you can maintain more cows over summer, rather than the culling that would normally occur. There is a movement to lower stocking rates, but improve performance per cow.

AF: Mirka has done a comparison of dryland dairy vs irrigated dairy which showed there were more cow numbers with irrigated land, than dryland.

AF: Modelling work has shown that adding irrigation doesn't add further nitrate, if the same amount of cows are compared.

GA: If you are going to justify irrigation, you need more milk solids to justify the cost, which leads to greater increases in urine produced.

AY: Are we talking about changing from dry-dairy to irrigated-dairy?
TR: For those on the waiting list there are some dry-dairy that will change to irrigated dairy, but also some dry-stock which may change to irrigated dairy also.

Are there other similar cases looking at nitrates and spring situations in NZ?
JT: Yes, in Rotorua.

Nitrate Summary Report Presentation - Lisa McGlinchey
Lisa McGlinchey went over the key parts of the nitrate summary draft report.
Key Points:

- The draft report summarises:
  - The various nitrate guidelines and trigger values available, including:
    - Drinking water
    - Nitrate toxicity (fish and invertebrates – and corrected for hardness)
    - Stygofauna protection
    - Nuisance plant growth (periphyton)
    - FLAG ecosystem health and cultural/spiritual values for WaterWheel work
  - The data and summary analysis for Te Waikoropupu Springs nitrate data
  - For the 2015 data so far, the springs get an 'A' band grade across all the guidelines and are below the trigger threshold for further investigation for nuisance plant growth
- Some work still to do on the Motupipi and Takaka Limestone Aquifer nitrates
- Some remaining questions identified for the nitrate scientists and iwi.

Discussion arising from presentation:

NM/AY: Regarding nuisance plant growth – is the trigger suggestion appropriate? And what would be an appropriate level for temperature in the springs?

AY: We've seen from Chris Hickey's work that nitrate toxicity on animals is dependent on hardness. Hardness is not related to plant growth.

Discussion around change in plant communities *[see the draft nitrate summary report and comments in the Stark report].*

PM: Clarity in the Springs is what we are mostly interested in.

AY: We are flying blind over the nature of the stygofauna – we know there is something unique about them because they clean up the water like nothing else, except at Blue Lake. We know the job is being done, but implausible that it is being done by anything other the living ecology.

AF: The physics of the system probably have a lot to do with clarity.
Blue Lake and Te Waikoropupu Springs are like giant sand filters.

AY: Sediment will settle out, but dissolved stuff will not.
PM: Dissolved substances don't effect clarity.

AY: Yes, it does. Clarity would be less if there was any detectable level of that "brown stuff"– see Davis, Covey and Smith.

[Post meeting clarification: while coloured dissolved organic matter can affect water clarity, nitrates are colourless and by themselves do not affect water clarity]

TR: The cultural and spiritual numbers [in the guidelines summary] – how were these reached?
LM: This was from the work the FLAG did looking at the attribute grades to use in the WaterWheel work with Aqualinc and Landcare Research.

AY: My recollection was that this was a fairly arbitrary decision, late in afternoon for the WaterWheel work and probably needs to be reconsidered.

The FLAG had a group discussion about the Cultural Health index as a way of measuring and defining cultural/spiritual health.

- There is a fundamental problem with this approach – there is a philosophical issue of trying to quantify cultural values.
- Can you show that this economic affect, is going to improve the cultural health of the valley?
- Iwi want a precautionary approach.
  MB: Many others across NZ want that too.

SM: We need to know from iwi (and applies to everyone in community too) about:
(1) Discerning the meaning of mauri
(2) How they account for change in mauri.
This could be the basis for questions for discussion with iwi.

AF: There's a philosophical difference between these 2 views: (1) philosophy using analytical approaches to determine how much change is acceptable, while accounting for risk and precaution vs (2) generalised concerns about development making things worse. FLAGs role is to apply some analysis to the challenge.

MB: People want to see good practices being implemented with water use
GB: Dairy is certainly doing that, and needs to be better at demonstrating that. Good practice needs apply to all uses, not just dairy of course.

MS: Can we get clarification about the time lag, surface effects and nitrate appearing in the springs and whether there is a downward trend relating to current land use practice or if we are looking at a time lag relating to 10 years ago?

Is it possible to put in a tracer in the aquifer system?

Presentation: Monitoring nitrates and other parameters - Lisa McGlinchey and Joseph Thomas
LM went over the sampling summary of what is being done and what could be done.

Key points:

- Current sampling includes:
    - River water state of the environment monitoring (standard ongoing programme)
    - Te Waikoropupu Springs – temperature, clarity, nitrates
    - Pohara Creek/Beach E.coli investigations following bathing water alerts
    - Takaka ten-year groundwater survey starting in Feb 2016 (last done in 1996 and 2006)
- Offer of time from FLAG members to undertake further monitoring
    - Discussion of rational for further nitrate monitoring in TWS
    - Discussion of priorities for sampling in Takaka Catchment

RSN: What monitoring can be done now – by FLAG members – that will be useful for FLAG decision making?

PM: Looking at Andrew's position [regarding further allocation in the TWS recharge area] - unless we can show with hard data that farmers have had some beneficial effect on the nitrate levels (eg the recently reduced nitrate levels in TWS) then we can't allocate more water. To do this we need more data points to look at the trend. My concern is that the irrigators have been waiting and are frustrated with progress and if we tell them that it will take 10 years to see a trend, they won't be happy.

TR: Within the framework [NPSFM] we are working in we need science based information.
RSN: You just have to use the best available information you have. Lisa has summarised what staff think is the best information we have. Hika has raised in the past – that FLAG agreed to use a precautionary approach, but that some members didn't appear to be – but this is related to what individual perceptions of precautionary means.

RSN: What frequency of sampling are we talking about?
AF: This depends on what the question is we are asking? – it will let us know if there is any further variation in the data set.

AY outlined the further sampling that he and others have independently arranged to undertake.

- Sampling at three locations: Main Spring, Fish Creek Spring, and at the overland inflow into the Fish Creek (when there is water).
- Samples will be analysed for Nitrate, DRP and Chloride in the two springs.
- Sampling will be weekly for 3 months. Following protocol provided by GNS.
- Chloride is being done to get further information on the proportions of the spring flows from the different sources
- DPR and nitrate is being done to get information on plant growth impacts.

- $5000 for the sampling has been put up by the Friends of Golden Bay.
- AY working with JT with getting equipment needed for sampling.

AY drew a summary picture on the whiteboard of the main spring and Fish Creek linkages, highlighting the aquifer residence times and percentage of flow from different sources.

JT: Would you be willing to share the data?
AY: Yes, we're going to publish it.

GA/AF: We will get some good information to test the theory of the shallow aquifer short circuiting to the Springs.

MN: How much dairy is in the recharge zone?
AY: About 2400ha.

MN: My concern is the validation of it all, if it is going to be questioned down the track.
AY: We are doing to do it to the best of our ability and following the protocols. Anyone is welcome to join us when we take the sampling to check the protocol out.
AF: You can also take photographs at the sampling time.
*LM: The next round of TDC TWS sampling will be in March – I suggest you go out at the same time as the TDC staff to do the sampling and get a duplicate sample to provide quality control information***.**
Action: JT to arrange date/time for Andrew Yuill to meet with TDC staff at the Springs for the next scheduled sampling in the TDC programme in March.

SM: Andrew F and Joseph - regarding the question we have on the recharge system – to what degree is the nitrate an indicator of natural vs human activity attributable sources – to what degree do you see further monitoring answering this?

GA: That is a good question – if the cow numbers have almost doubled and we are told all the nitrates are from cow urine, yet the nitrates haven't gone up – what are we missing here?

SM: Could more frequent data give us an answer?
JT: It depends on what you are looking for.
AF: We need a hypothesis – if we are looking to answer the question of whether there is a preferential flow in the shallow aquifer (ie Fish Creek Spring) – then the more frequent sampling proposed could provide some very useful information.

RSN: It could allow us to attribute, or it may not – FLAG may still have to make a decision with uncertainty and that comes down to a question of what level of nitrate in the springs is acceptable and what is not. And if FLAG can't attribute it to land use what does this mean for our allocation decision…

JT: TDC has added Fish Creek to the data set since FLAG started – the nitrates in Fish Creek have been slightly higher than in the main spring, but it is consistent. But we need to ask ourselves what are we trying to manage?

GA: We don't have cause and effect – if cows aren't making that much difference…
SM: There are 4 sources – the natural sources, lagged legacy from past human practices, current generation of practices, potential in the future. What we don't know about the system outweighs what we do know.

RSN: This raises whether an adaptive management system is appropriate. FLAG should go back to the last notes and where they placed themselves in the allocations options for TWS [see page 15] and review your place with respect to what you do and don't know. *[Post meeting – table reproduced below]*

Reproduced from 27 Nov 2015 FLAG notes – page 15
Summary of FLAG member positions:

Status quo for nitrate levels in TWS (0.45mg/l)			*TWS 10% allocation regime (766l/s) (0.5mg/L)*
No further allocation unless mitigation is first undertaken that reduces nitrate levels to 0.3mg/L	*No further allocation unless mitigation is proven to keep nitrate levels at/below 0.45mg/L*	*Further allocation allowed, provided no increase in nitrate levels*	
Andrew	*Neil* *Piers* *Martine*	*Greg* *Hika* *Mike*	*Mik* *Kirsty* *Mirka* *Graham* *[Tony]*

[Note: Margie yet to indicate her position]

Action: FLAG to review their place in the allocations options summary table [page 15] of the 27 Nov 2015 notes and advise other members and staff of any changes they would make.

AY: Last time I showed the FLAG a summary of nitrate loads of what is going into the AMA and coming out. In summary:

- 412 tonnes going in
- 282 tonnes from the valley - using standard figures for sheep/beef
- 242 tonnes unaccounted for.

If this was from dairy this equates to 101k/ha/year. If not from dairy, then where is this coming from?

JT: Did this coincide with the catchment model results Andrew F?
AF: Yes, roughly.

TR: So if the loads have increased, why aren't we seeing the nitrate levels increasing comparatively in the springs?
PM: Yes, the nitrate levels are not in the same order as the load increases suggest they should be.

RSN: FLAG talk about nitrate a lot – are we making any progress? Are there things we need to be focussing on or is a lot of this just distracting to our process? If anyone has thoughts on this, please let me know and I will look at a process to address this.

GA: Joseph, if you had unlimited budget – what would you do?
JT: We are planning to sample two deep bores in the upper catchment to build up information on what the marble aquifer doing.

LM: I have included a link in the nitrate summary of a good example from California looking at nitrate issues there. They identified that there was such a complex system, as well as the complexity of the nitrogen cycle, that it wasn't possible for them to look at understanding it in order to determine the nitrate risks and issues. They decided instead just to focus on the parts they could easily measure – the nitrate being added by landowners (fertilisers, etc) and the nitrate being removed by landowners (crops, wood, etc) – the rest being available to be leached into the receiving environments. They then agreed to the assumption that land use is affecting the receiving environment and from

this refocused to look at good land management practices to minimise the nitrates able to be leached.

Session 4 –NPS framework – next steps [DEFERRED]

[The group ran out of time to cover the final session on the agenda looking at water quality threats and risks and the planning framework – this will be covered at a later date].

RSN gave out copies of the presentation on water quality threats and risks and the planning framework.

Action: LM to send out copies of the water quality threats and risks presentation and other resources discussed to those absent.

Session 5 – Project Management

Next steps in process / Next meetings

Next meeting – note change to meeting date: 19 Feb

SM: Staff need FLAG feedback on the preferred approach to the project and the table summary of decisions.

Action (repeat): FLAG to look at revised project timeline and solutions summary tables once sent and feed back to Lisa McGlinchey.

Other comments

No other comments.

<End of meeting>

Action Points – Council Staff/Facilitator/Advisor

No.	What	Who
1.	LM to send out Canterbury ZIP example document to FLAG.	LM
2.	RSN to review community document with AFs & MBs comments in mind.	RSN
3.	LM to send out invites to scheduled FLAG meetings (including EPC workshop on 23) and the tentative meetings proposed.	LM
4.	SM to liaise with iwi and advise FLAG of hui date(s).	SM
5.	RSN to follow up with FLAG via email regarding the consultation update document.	RSN
6.	LM to send FLAG the draft Summary of FLAG decisions (Solutions Summary).	LM
7.	JT to arrange date/time for Andrew Yuill to meet with TDC staff at the Springs for the next scheduled sampling in the TDC programme in March.	JT
8.	LM to send out copies of the water quality threats and risks presentation and other resources discussed to those absent.	LM

Action Points – FLAG members

No.	What	Who
9.	FLAG to go through project timeline and think about which option they want to proceed with.	ALL
10.	FLAG to review solutions summary table and feedback on areas of issue to Lisa McGlinchey.	ALL
11.	FLAG members who have been discussing water issues within their respective circles to summarise key issues/topics/questions raised and feed this back to Lisa McGlinchey as bullet-point emails.	ALL

12.	FLAG to forward issues they think are misunderstood in the wider community for consideration for communications clarifying issues.	ALL
13.	FLAG to review their place in the allocations options summary table [page 15] of the 27 Nov 2015 notes and advise other members and staff of any changes they would make.	ALL

Action Points – FLAG Sub-groups

No.	What	Who
14.	RSN/Mik to send out final draft of community update document to FLAG	RSN /MS

Scheduled FLAG and FLAG Subgroup meetings

Date	19 February 2016 (FLAG Meeting 18)
Time	9.30am -3pm
Venue	Takaka Fire Station
Agenda Items	Motupipi and coastal streams. ?Barney Thomas

Date	11 March 2016 (FLAG Meeting 19)
Time	9.30am -3pm
Venue	Takaka Fire Station
Agenda Items	tbc
Date	18 March 2016 (FLAG Meeting 20)
Time	9.30am -3pm
Venue	Takaka Fire Station
Agenda Items	tbc

Information and resource documents identified during meeting

Date	Title	Author/Source
	None	

**Key documents available electronically will be added to the online PDF document bibliography.*

Issues or topics identified during meeting for future consideration

Topic/Issue Description	Requester
None	

**Issues or topics unable to be addressed at the meeting, but requiring future consideration will be recorded in the Takaka FLAG 'Information Eddy'.*