Meeting Minutes
Rotorua Sewerage Steering Committee

Final - RPSC Technical Advisory Group Meeting #4

Date:	12 September 2014
Time	9.00am – 4.00pm

Venue:	Rotorua Waste Water Treatment Plant
Chairperson	Jim Bradley (Independent Technical Advisor - MWH Consultants)
Attendees:	TAG Members DH – Professor David Hamilton (Waikato University) KM – Dr Kepa Morgan (University of Auckland, Independent Technical Advisor) GM – Greg Manzano (RDC) AL – Alison Lowe (RDC) Alex Eppinger (Visitor from Waikato University) Helen Ferguson (Administrator)
Apologies:	Andy Burere (BOPRC), Christopher McBride (Waikato University), Riaan Rossouw (Hydrus Engineering Consultant).

1. Meeting Format/Record keeping and Action list updates

JB - welcomed Alex Eppinger from Germany who is currently assisting David Hamilton

KM - opened with a Karakia.

JB - My meeting with Warren confirmed that this will be RPSC TAG meeting #4 – Although TAG#3 did not take place we had a brief formal meeting after the RRSSC TAG meeting #5.

- Need to focus on discharge locations. Major item today is the whole effects location study.
- An Action list of 20+ items put forward from Greg, Alison and myself is our key for today. (Attachment 1)
- TAG is being in updated with technical inquiries from Warren and Committee we will look at the best way forward to address this.
- RECORD KEEPING **–** Discussion took place regarding the degree of recording published in the minutes.
- At the end of each agenda item record a summary only, ensuring that the key output, contentious minority views are recorded and under the TAG terms of reference the Chair has the ability to seek further information on minority views where necessary.

- **Note: TAG to agree on the minutes and reports before they go forward to the Chair.**

2. Previous Meetings and Minutes Approval

Do records show Minutes from TAG 1 & 2 (as #3 was only an agenda item on the end of RRSSC #5)?
ACTION - Helen to investigate.

Further discussion took place regarding the availability of using a website/URL to access minutes with the intention of adding edits and keeping track changes. Keeping track changes would save comparing documents.

ACTION - RDC to look at availability of this request. If available we would need to set up with protocol statement.
This will include RPSC TAG and RPSC Committee minutes. The Chair will check before they are finalised.

KM – Gave examples of decisions that need to be formalised and noted in the minutes. Correspondence was also missed due to the TAG meetings being so busy.

As previously mentioned Jim, with Warren being ahead of where we are at with solutions, and as we are still doing the ground work, it's important that his emails go into our correspondence.

Note: Key correspondence and terms of reference matters, as they apply to a particular item need to be clearly recorded in our minutes as part of that action item.

3. Review draft – Agree on key TAG topics for this meeting & (TAG Action #23 – Attachment 1)

Action # 23 Kepa's Questions (Refer to Action Sheet – Attachment 1)

Item 3 – Birds and dredging for RPSC

Item 8 – Warren's subsequent questions

Item 15 – What we present to RPSC next Wednesday.

4. Update on RPSC activities and future actions including consultation (Attachment 1)

- Greg was at Kaituna hui earlier this week. Andy did a 6 slide presentation introducing the project to the wider group.
- Through WW the group was invited to Te Maru –Kaituna Authority to have a representative on the RPSC, which they are considering and will get back to WW
- DH - It was very useful. David realised how "up in the air" this project still is. It's a big change to move away from a land-based system.
- The Kaituna was raised. David sensed that the Kaituna has been thought of as a viable option but the feeling is this might be difficult.
- Kepa discussed the precedent that had been set from the past and the potential issues with this option.
- WW - has questions that need to be considered by David.
- Good discussion

5. Update on overall project program

- Greg updated

½ day workshop will be held during the week of 20th November for TAG and consultant to review the report submitted by Mott McDonald. They are on track in terms of this programme.

6. Progress on Detailed Feasibility Investigation Work – Wastewater consultant (TAG Action #7)

Greg. We have 3 major pieces of work underway:

1. Detailed Engineering Study 'Alternative investigations study'– underway by Mott McDonald and will be finished in Nov. JB wants recorded that MWH did not put a proposal in for this piece of work. GM There were 3 consultants and the tendering was close.
   Greg provided some initial rough sketches for TAG to consider. DH The wetland has low retention time, more like a pond re-entry, and TAG needs to look through these and how they might need to be designed to achieve certain outcomes. GM the discharge mechanism is not really a 'design' at this point, rather it is to cost the options and determine what the quality of the discharge will be. AL Do we need to consider 2 sizes of wetland and carbon bed? –(ie turnover 20x/day or 2 days retention for example).KM maybe we need to be flexible with the options/modifications?

   ACTION There are 2 things missing that Greg will include and discuss with Mott McDonald: Engineered-type wetlands (longer retention time) and diffusers. We also need to include floating wetland, (eg 'in' the lake). – **(Since covered).**

2. Effects Study

3. Consultation Stage 2 will soon get underway. Warren and Greg will have a first cut. Mostly background info from the workshops. Will be complete towards end of month and circulated for review. 4 major meetings/hui will be scheduled for discussion of options. April 2015 aim to have agreement on preferred option.

KM - For consultation, it's important that we separate the options: (i) the Treatment options and (ii) where it goes (which will be the difficult part) and this will be the most important to consult on. We need to be clear on WHERE it goes and the IMPACTS. JB - Let's continue with this in the agenda item 11.

GM When the Engineering and Effects studies are complete the aim is for TAG to come up with a "super-short' list.

There was discussion round the timing of getting the information and consultation.
Consensus - stage 2 consultation will not have any costings included.

Action –Chris McBride put together a very useful spreadsheet that combines the treatment options with discharge options to give effluent quality. Alison and Chris to check current version and send to Mott McDonald

KM: Do we have any constraint maps for this project? (eg: 72 waahi tapu sites have been identified down the Kaituna. (Greg that would be useful to pull together as a GIS overly).

Action RDC to pull together a GIS overlay of near WWTP through to upper Kaituna - parcels, ownership, recorded historical cultural sites etc with later outputs from effects study and Mott McDonald.

KM does it show wetlands/swamps. We will see from aerials.

7. Water Discharge location and effects – What are the key studies/investigations Work – Wastewater consultant (TAG Action #4 & 8)

Greg – Hasn't explored contractual details for engaging Waikato University to do the effects study yet, and he needs to discuss with AB (DH agreed). Let's focus on methodology first
Action. Greg will sort engaging David for the effects study with BPORC

DH. David showed the Lakes Takiwa (mapping). Map resolution changes – currently at 50m contour). Keen to link GIS layers with Greg which should be made available online.
DH went through the presentation including "effects of discharges" similar to that presented to Steering Committee.

- TLT varies over time. KM mentioned 1997 geothermal policy changes. Arrows 2005 and 2007. 2006 alum dosing started. In 8 of 9 Lake Rotorua inflows, the nitrate concentration has increased over time (1968-2003, and probably reflects land use effect.
- TP spikes from storms flushing, sediments etc. TN if WWTP effluent around 5, cf 1-1.5 in surface inflows.
- Volume of discharge = 1.5 % of flow.
  Action David will look into volume before and after LTS discharge to see change in volume associated with ceasing LTS and discharging elsewhere.
- 66% of N added is retained in lake, ie 34 % of N would flow out of lake
- A lot of work on P and the retention is a little lower – model doesn't differentiate between DRP and particulate P
- .425 to .445 g N/m3 increase which is borderline significant
- Alum does to Puarenga since somewhere around 2010/2011
- Alum dosing has reduced the TLI very effectively, in changing the lake from being predominantly N-limited to predominantly P-limited

- Circulation patterns vary depending on wind direction (eg: Ngongotaha stream disperses predominantly around the shore and doesn't go into the middle of the lake ie small scale-localised currents with occasional large flows that go slightly more towards the centre of the lake).
- Transition zone closer to lakeshore where nutrients are not limited cf centre of lake N-limited
- Showed Lake Wivenhoe as an example of a barrier system between the treated effluent and a 13-step barrier system (including RO) and the water supply found things like radioactive form of iodine, caffeine, steroids from not just humans but farms etc . >$billion infrastructure. Now mothballed because they have enough water from the dam therefore it is not needed at present. They used same models that we are using for Rotorua. They had water conservation programme and are down to 140l use per person/d. At same time 3 other large Australian cities invested in desalination (RO) plants and they aren't being used much. We need to consider our options carefully as we don't want to create a White Elephant.
- David's action effects study needs to consider mixing.
- Will there be any residual alum in the treated effluent?

Action – Greg to ensure Mott-McDonald consider residual alum in the effluent from options 1, 2, 3.

- ***The balance is quite tight with N and would change with/without alum.***

David action - Effects study will need to consider both future scenarios – with/without alum dosing streams.

- Biggest impact on fish is the sediment from floods and there doesn't seem to be an alum barrier. Open to suggestions – Andy Bruere is talking to Ian and TeArawa fisheries on what spp could be included and monitored to show protection of spp. Increasing biological monitoring. Ecological monitoring (eg: Koura has centred around bioaccumulation of mercury in these fish).

KM raised dredging as an option (in email). DH – there was a consultant's report done on dredging. KM there does seem to be more fine sediment.

JB – Action TAG has been asked by RPSG to gather the references/reports on the birds, dredging etc (who?) (Update presented to RPSC September meeting)

- David's photo (case study Ohau channel flow direction) shows shallow waters about 1.5 m from shore then it drops off. There has been deposition of ashes in some deeper locations (about 40m deep whereas main basis is about 20m) that are associated with finer and high-P. The layer that the nutrients are in is deep and fine, and divers have reported that it is difficult to tell where the water/bottom interface is therefore, dredging would not be simple.
- There is some concern now about how much P is in the terrestrial catchment,(ie a lot in the ag catchment, heavily loaded and potentially transported to lake).
- Farmers are trying to maintain Olsen-P at around 75 which means that they have been applying a lot of fertiliser. Is there an Action for a Lakes Land TAG to consider the applicability of the Olsen P 75 as a target?
- Are there opportunities to use more abundant or naturally occurring materials instead of Al? Yes the nano bubble technology looks promising where the sediments are modified (with nano-bubbles) and then reinserted into the environment about .5 m thick. Ngati Rangiwewehi is interested in this research as an alternative to alum.
- Sediment cores show up to around 1m of sediment on the bottom waters of Lake Rotorua since the Tarawera eruption.
- To summarise, effects study needs to consider the lake with and without the DRP reduced as a result of alum or similar. Dredging will be difficult. Sediments also contain arsenic and mercury we don't necessarily want to dredge that up for use.

Effects Study

- ***David's work brief requires further action by RDC***
- This is a very large piece of work.
- Can't really do a simple or rough cut because we need to run data through models.
- Locations – won't be that simple, will be multiple locations and considerations and the GIS mapping including constraints is essential.

- David went through a list of specific questions and these were discussed further (include from David).
- Temperature profiles – once you get towards the centre the dilution is great.
- Could the work be staged to the extent that could enable us after stage 1 to get to the 'super-short- list?

Action –Greg to find out what size wetland is required to supplement the remaining requirement for wetlands in lieu of the airport substitution requirement.

Action- David to write a scope to submit to Greg, and run past TAG.

First, David will provide a key-point slide on his proposal for the 'effects' study for the Steering Committee next week and seek any feedback from them.

Info and answers to be provided to Warren and the Steering Committee **(refer slides – RPSC September)**

1. **By what standards can we judge the impact of WWTP discharge on the receiving water body?**
   Nutrients e coli temp om BOD COD SS clarity micros. Difficult to set exact standard because they relate to meeting the objective of the water and land plan, ie: TLI 4.3. There are discharge standards: section JB… DO clarity etc. that will generally be met.
   Mauri and life-supporting capacity not easily defined. How will we do that? – KM-relate back to some of the water parameters. CHI has 3 measures: physical, aesthetics, mauri. Some of these will be addressed in David's Effects study.

2. **What is the role/impact of wetlands as a potential receiving environment for WWTP discharge as RPSC is currently getting very mixed messages?**
   TAG's comment: There are different types of wetlands and the performance will change in different situations. JB to pull together some examples of different types etc. botulism potential/mgt?

3. **What are the specific concentration impacts (TN, TP, and E.coli) of direct discharge to Lower Puraenga Stream, main body of Lake Rotorua: Upper Kaituna. TAGs comment: See proposal from David. Also include David's responses to earlier questions.**

8. WW – Technical deliberation questions 20th August residual answers (TAG Action #18)

(Attachment 2 – Warrens report to his subcommittee)

Good discussion took place regarding the setting up of Warrens subcommittee and how best to reply to his technical questions.

9. Receiving Environment quality, ecology and options effluent standards

Table (action to begin to compile) Strategy and Tools - RPS, NPS, ANZECC, mauriOmeter for existing and effects for each option (all 5 options).

- Note that the RPS is the overarching document (TLI)
- This will be a working tool that we are developing and populating.
- Will not be finished immediately. We'll make a start and this will help identify where we need more information also we cannot answer some of the mauri questions and we require further info.
- Include the parameters on the list.
- Include the mauri.
- We need commentary around each guideline to show statutory reasons for inclusion of statutory guidelines and tools etc RPS overarching doc get from Andy, NPS –get from David, mauriOmeter get commentary from Kepa.
- Ensure that the effluent concentrations are not presented and compared with guidelines in isolation from the levels I the receiving environment.

- ***Action: (JB/AL) will draft the table template for inclusion in presentation to steering group but not put any data in it yet (Since done).***

KM. CHI is a monitoring/benchmarking tool and not necessarily the most appropriate tool for assessing the potential impact/effects.

10. Other options (TAG Action# 1, 2, 3 & 12)

- Further work required (flagged)
- Indigitech, biochar, other option
- No more responses from these flagged items.

11. Consultation document and preparation consultation material – review of technical content (in conjunction with Warren) - (TAG Action# 10 & 11)

Greg and Warren currently working on this.

12 All other actions on action sheet updated 22/08 – address and decide way forward on other actions that were not addressed above.

We will do a high speed troll through the action list many of which we have already covered and the action list is on the updated table.

Alison what's the best way forward, do you want to keep taking notes or do you want to put the action list up?

JB – In reply to your question Kepa

In the first meeting we set up as a TAG our minimum requirements. We then added "to be mindful of cultural "and we used that in our assessment down to a flag list and short list.

That is the terms of reference approach that we as a TAG have set up. We have not gone any further in terms of decision processes at this stage other than to get our minimum technical requirements, engineering, environmental and economic that were presented to the project Steering Group on the 16th July.

KM – Are you giving me that or are you referring me to an email?

JB – I think that the dilemma you have is that the minutes have only just been confirmed. I am absolutely sure that Alison and I put that together in an email and sent out the next day saying "Hey TAG we represented ourselves pretty well, thank you and here are the slides".

KM – raised the Cawthorn report and suggested that the MauriOmeter could be viewed as the gold standard decision making framework. There was discussion around this and it was decided that it would be included as the tool for consideration for the cultural subcommittee.

Note draft minutes reviewed at TAG minute # 5 20 November 2014, minor edits made –plus further comment from KM as recorded in item 12 above included. This item is further discussed in the TAG 5 minutes.

Kepa closed with a Karakia

Summary of Actions

Action Items	Assignee
Do records show Minutes from TAG #1 & 2 (as #3 was only an agenda item on the end of RRSSC #5)? Helen to investigate.	**Helen**
RDC to look at availability website/URL set up from minutes. That enables shared editing and keeping track changes. If available we need to set up with protocol statement.	**Greg/Helen**
There are 2 things missing that Greg will include and discuss with Mott McDonald: Engineered-type wetlands (longer retention time) and diffusers. We also need to include floating wetland, (eg: 'in' the lake).	**Greg**
Chris McBride put together a spreadsheet that combines the treatment options with discharge options to give effluent quality. Alison and Chris to check current version and send to Mott McDonald	**Chris/Alison**
RDC to pull together a GIS overlay of near WWTP through to upper Kaituna - parcels, ownership, recorded historical cultural sites etc with later outputs from effects study and Mott McDonald.	**Greg**
TAG has been asked to gather the references/reports on the birds, dredging etc (who?)	**TAG**
Greg to find out what size wetland is required to supplement the remaining requirement for wetlands in lieu of the airport substitution requirement.	**Greg**
David to write a scope to submit to Greg and run past TAG.	**David**
Draft the table template for inclusion in presentation to steering group but not put any data in it yet	**Jim/Alison**

Jim please attach below:

Attachments

(1) Action List of 20+ items

(2) Warren's report to his subcommittee