Draft Meeting Minutes

Rotorua RPSC
Technical Advisory Group Meeting #6

Date:	Wednesday 8 April 2015
Time:	10am – 3.05pm

Venue:	Wastewater Treatment Plant
Chairperson:	Jim Bradley (JB) – MWH
Attendees:	Andy Bruere - BOPRC, David Hamilton (DH) – University of Waikato, Greg Manzano (GM)- RLC, Alison Lowe (AL) – RLC, Kepa Morgan (KM) – Mahi Maioro Professionals, Chris McBride(CM) – University of Waikato, Arturo Pingol (AP) - RLC, Antoine Coffin (AC) – Te Arawa Consultants, Sarah Pauli - Minute taker
Apologies:	Eric Cawte, Andy Bell,

PLEASE NOTE: these draft minutes are substantially verbatim as per the recording made by Sarah Pauli

JB - welcomed all attendees and gave a special welcome to Arturo Pingol and Antoine Coffin and also Sarah Pauli who will be taking the minutes.

JB advised that will need to look at where Antoine's time fits into the Agenda as he will be leaving at 12 noon.

Kepa Morgan opened the meeting with a Karakia.

JB advised that in terms of the agenda, it is a draft and it was done before we had been assured that Antoine would be able to stay to at least 12 noon or slightly before, so what I would like to suggest is that if we open up the discussion on the draft agenda. I am suggesting after item 3 we hand over to Antoine to update us where the cultural assessments sub-committee (CAS) is at the moment and particularly what technical effects information he is seeking through the committee and from us. And so with that, a new item after 3, between 3 and 4 and I also think, Greg, MWH have got a bunch of consents on. We have had a real wakeup call with the Freshwater MPS. I think later in the Agenda if we could just spend a few minutes to think about whether we need or not, the planning instruments implications, so I suggest we try and put that towards the end of the Agenda. The other thought and question Greg and I had and Arts work on sites, whether we should try and visit first cut sites or not. I think we leave that floating probably not, we have one hell of an action packed Agenda. So, comments on the agenda on things missing. It has been five months since our last meeting and a lot of work has been done.

AB advised that he and David had to get away at 2.45 p.m.

JB asked for any comments on the Agenda.

KM advised of one addition, to revisit discussions from last meeting regarding the process that we use. I have noted the minutes from the meeting by the Steering Committee and I think it has raised issues that we need to bring up again. That might be useful to actually discuss.

JB – Absolutely fundamental. So I think as a subset of that new item 3a, we will bring it in there.

2. TAG – NO.5 MINUTES OF 20 NOVEMBER 2014

At this meeting, Kevan Bryan presented Mott MacDonalds report and we had a visit from Michael Quintern and a phone call from John Darmody briefly. Helen Fergusson transcribed these minutes and I had a touch-up edit of a few bits and sent out with an email late November 2014. I also took the liberty drafting all of giving them to Warren because I felt it was going to be so long to out next TAG, even though TAG's instruction was not to make them available till we had confirmed it, which we are now going to do with any adjustments. It took that liberty that I did give everyone a chance to say don't do it and no-one responded. Thank you for that.

JB asked for comments on the Minutes.

JB - Page 1 – the only point I note is the shared website Andy. You have done your bit but it has not been set up. Hilda assures me it is about to be, it is just a matter of time at her end. I believe you did have a run of emails, but you have not had a lot recently.

AB - Page 2 – Should read Water Conservation Strategy not "water concentration." AB does not recall getting this information. AB to check his emails. AB advised that Eric was to forward through the link to the strategy, but does not recall receiving this. Greg to follow up on this.

JB - Page 3 – JB noticed Kepa that he wanted comment about where TERAX had come from. Reading the Minutes, I believe this has been reasonably well answered in the third to last paragraphs. KM was happy with this. This is also an agenda item today.

KM - Page 2 (second to last paragraph) – this is attributed to Alison, the discussion about the Cawthorn report, were you recording that I raised at the previous meeting or is that me that is actually commenting.

JB - Advised Kepa that he had raised it.

JB - Then it gets quite detailed on Kevan Brian's report.

JB Page 4 - no comments
Page 5 – no comments
Page 6 – no comments
Page 7 – I recall Alison you left after lunch. Minor point.

AL advised that she left at 2.00 p.m.

JB - Page 7 – Kepa, again you requested details be put in the report about the "cons" for Bardenpho and I am not sure without checking the extent to which that was done, that the Bardenpho was put in, I take it, in a better light with the report that was completed and it clearly indicates where the Bardenpho sits. Also, at the bottom of page 7, we kept it open for a week for comments on the report other than over those made at the meeting. I did not receive any comments, but I had few editorial type matters that were run past Greg, they incorporated in the last report but they were not matters of great substance, they were just editorial matters and consistency. Report is not finalised.

JB - Page 7 and 8, Michael Quintern – Can I ask Alison and Greg what happened with the two reports he required.

AL - He was non-specific about the reports that he wanted and they did not actually exist, there were no reports that we could hand to him that answered the questions that he was asking, but we did give to him the material that was available.

JB - So there is nothing there that is likely to come back indicating that we did not do our bit.

AL - There is nothing else to provide.

JB - Page 9 – Land Treatment System Options is a major agenda item today, so all the actions there were picked up and things have progressed and Greg will update us soon.

JB - Page 10,11, 12

KM - Page 12 - That action on drawing up the land treatment system, is that this one here.

JB - No that is possible discharge locations. They both are major agenda items today. Also, the land options investigation, Greg is reporting on shortly. The key part of that meeting was that we as a TAG significantly agreed that all work needs to be done to put that back and that work is being actioned.

JB - Page 11 and 12 - At the bottom of 12 is "add-ons", and that is the major agenda item. Alison and Arturo have been busy on that.

KM – Page 13 (paragraph 1 – line 3) – Add "analysis of" after holistic and "Steering" Committee.

JB - Page 13 - JB asked Kepa if he was happy with the wording on the bottom of Page 12 (11d), "but I feel that Warren interrupts that as a suitable substitute MauriOmeter analysis…", doesn't seem to read write.

KM - I think the point being made here is that subsequent to Warren's presence at the previous meeting, where we did discuss the Mauri Model as a basis for our process and we were making progress on that, Warren had gone and set up this Cultural Advisory Sub-committee and what I am saying here is that those actions of Warren, which I am not sure where they originated from in terms of motions and so on, they have interrupted what process was that we were talking about. Looking at the minutes from the January meeting of the Steering Committee, it seems that our discussions in relation to it haven't been represented, it is very brief, it is one line, which said you talked to MCA and the Mauri Model and does not give any details about what you actually said. I feel that there are processes outside processes that are occurring here. I have not seen any timeline where these decisions are actually being made.

KM would like 11d (page 12) to read as follows:
"Since our last TAG, the Steering Committee has formed the cultural sub-committee to do cultural assessments for the effected iwi groups, but I feel that Warren's actions have interrupted our process, and sort a substitute for the Mauri Model process." I am pointing out that the CIA is not the same as Mauri Model. Maybe it is just the way it comes across on the recording but I can redraft that and give to Sarah at the end of the meeting".

JB - Page 13

JB - With those corrections and a redraft of the Minutes, would someone like to move.

Moved: Jim / Seconded: Andy
Approved

3. REPORT ON RPSC MEETINGS/WORKSHOPS AND OTHER ACTIVITIES SINCE LAST TAG MEETING ON 20 NOVEMBER 2014

JB - Greg maybe you could update here. Jim to fill in any gaps, but it is fair to say that the full committee has been particularly active and met monthly and kept us on our toes a little bit on providing information that we could readily provide and a number of cases that you have seen on slides. Greg and I have been quite clear on this, that in our opinion, matters that have not required full TAG consideration and the fact that we have not met for five months and they have met every month, they have covered a lot of ground. Those minutes were sent out yesterday morning when Hilda put them together and there is at least one set of the hard copy, here.

GM - There were 3 meetings after our last TAG meeting, 17 December, 21 January, 19 February and 19 March. Most of the minutes were in the Agenda pack. Greg advised that he would summarise the key technical issues that had been raised so that we do not spend a lot of time on this. During those meetings, and I won't be specific on the dates that they were raised, but the key technical matters that were raised was about their interest on the Orange County Water District Ground Water Recharge System which raised interest on ~~our~~ reverse osmosis and ultra-filtration. The RPSC wanted some more information on that and what we have done, between myself and mostly Jim have prepared a paper for presentation to this group on reverse osmosis. There is also some interest on Black Mica which is a type of a Biotite mineral, so we need some research and presented information to them but we are bringing back to this group as well.

Queries about the add-ons, what has happened with those add-ons, that we initially started investigating and we thought we have summarised it now and bringing back to this group again for discussion. There were a lot of questions related to so many issues, cost of UV, end of pipe circles, the Cawthron EDC Report, what happens with concentrate coming out from our whole processes. There was some interest about the different effluent water quality parameters where we monitor them. There was some concerns about mortuary waste. The site visit that we had in the afternoon to the LTS with the group as well, and I was quite happy with some of the response. Both of those issues are being brought to this group. What I agreed with Jim was, as a minor query, we could just respond to them direct to the RPSC, but if it is a major technical query, we have to bring it back to this group and agree on a response to the queries. With respect to this meeting, we are bringing everything, all the queries that came from those meetings into this group so that we can discuss and agree on a way forward.

JB – In that respect, one of the handouts you have got was a Q and A. Part A was the questions that we felt we could easily answer and we just wanted to keep the information flowing and that is going out with the draft minutes from the last RPSC, which was held in this room and then we did the site visit, ~~that is going out any day from Hilda~~ and Part B of those questions which was a major agenda item today, they are the ones that come back here. So a number of those are separate agenda items but we need the appropriate time to mesh those. Part B – we have continued the kind of format that we started right at the start, which Alison had a big hand in, that we have a slot at each RPSC meeting where we present TAG output or under technical and we attach those draft minutes from RPSC and that was those items that Greg covered with slides. They are becoming very knowledgeable on a whole bunch of things and asking some pretty technical questions from what they read or what they search, particularly Peter Staite is on that. The Orange County aquifer recharge with RO cropped up, ~~the RO~~, from a TV programme, but David, you mentioned the same technologies of course when you gave that talk on the Brisbane exercise. We found a technical paper and was an attachment that we gave them the other day that kind of gave a state of the internationally of those type of technologies we are coming back to those today. It is interesting the focus has somewhat been technical and technology and of course, we are all waiting with baited breath on the effects at the end of it, because I have got to kind of say quite often ~~is~~ don't forget this thing is effects driven including the social cultural. Proven technologies there to achieve it. ~~So, any questions on the kind of activities of the RPSC.~~ The visit up to the land treatment system was very beneficial, nothing like seeing Mauri of course Kepa and Maori people are visual as Geoff Price keeps reminding us. That was a very useful visit.

JB - Any further comments or questions.

JB - It is a very interesting committee from my observation in that they charge within getting there and with an outcome and a willingness to really address the issues through and then reflect from the cultural sub-committee and the technical side.

4. CULTURAL ASSESSMENT SUB-COMMITTEE (CIS)

KM asked Antoine about the questions being asked in the workshop. It seems there is an emphasis on the physical data? In terms of the considerations of Mauri impacts, other than the physical data that is being provided by the technical committee, what is the process that CAS is going to use regarding all the metaphysical stuff?

AC - Good question. I think it is fair to say they have been very light on the metaphysical aspects of the settlement of the Wastewater Treatment Plant particularly in the discharge areas and that is probably being influenced very much by the members. We have got several members who are really strong. 99% of their focus is on water quality and the physical aspects of this and where most of our attention has been, particularly on the Mauri side. At the moment the process we are addressing is that. Gina and I are trying really hard to draw their attention back to that.

KM - So you will facilitate them focusing on that. What is your process?

AC - The main process we have at the moment is that the cultural assessment is being prepared by the Iwi themselves. That is the process at this stage.

KM - So the cultural assessments are prepared, it seems with a fairly strong focus on physical data that has provided a physical report. The physical environment data that is presented back, but how are you ensuring that the metaphysical stuff is actually being included in that, because if you don't, then that stuff will come up later on after we have made decisions, which won't be helpful.

AC - We are working on setting up what our expectations are of the cultural assessments. We think we are well covered on this. These are the areas we really need to focus on. There is a little bit of push and pull. We are just trying to push them in that area.

KM - So you are looking for a descriptive type qualitative type?

AC - I will give you an overview of where we have got to, which may answer some of those questions. Then you can pick some feedback on how strong or not that is because we are keen to get some help in that area because that is affecting us at the present time.

So we have had effectively 2 workshops where we have been focused on cultural assessment. The first one was in February and what I wanted the group to do was really focus on what is their objective, what do they really want to get out of this project, rather than just responding to the immediate preparing a cultural assessment 'tick', where are involved, we are meeting 'tick' and everyone goes home. Where do they want to see it? So we spent quite a bit of time in the first workshop and we came up with six objectives and then we have confirmed ten at our last workshop and they set out their current expectations of, which I think will be quite helpful, not only to this group, but also to the Steering Group around expectations of completion of the project around some of the outcomes, how the project rolls out and some of the 'what will happens' as part of the project. The other thing we went to, we just touched base to make sure that all the members were really clear about the different options, there is a lot of jargon being used, a lot of acronyms. It would be fair to say, I think their awareness is higher than mine in terms of the project and all the different options that are in play. Probably the weaknesses is understanding what the combinations are, which should be expected, around configurations of the plant will work and which ones won't. There is not a lot of clarity around for those members. They have had the presentations and they like different things, they should work together because they would achieve a good outcome so obviously there are lots of technical reasons why that may or may not happen, but I think that will come, but that is currently the level of understanding amongst the members, it is

quite high. We have spent a bit of time on literature reviews, we have identified all the impact assessments that have been done previously. We looked at some tribunal recommendations, tried to make sure that those are incorporated in the Kaituna River. We don't want them to forget where we have been. We are always moving forward so that has been done. And then we talked at length at both workshops around the preferred approach to cultural impact assessments. My recommendation was that we use either the Mauri Model or a multi criteria model to move forward. The members did not agree to that, they wanted to do a value base assessment, which we have done. It is a little bit more scattergun approach, here's a bunch of values, how might they be expressed in this project, what will be the responsibilities on Iwi Manu whenua themselves and what might be some responsibilities of Rotorua Lakes Council. So there is a matrix full of things that they would like to see. I am just working through trying to put those into a coherent list that could be mitigations, they could be avoidance measures,, could be remedies, things that happen as a result of the project. That's where we have got to with that one. The preferred approach was that each Iwi would be given the opportunity to prepare a cultural impact assessment. What's happened is, when I put that back to them at our last workshop, we effectively had Ngati Hurunga Te Rangi saying we would like to lead, the other iwi members wanted to actually just have an input into that one. Iwi are quite sensitive, they want to have their say, so the others are looking more like they are having a collective cultural assessment, so at the moment we are looking like we are going to have two assessments prepared, a collective one that supports Ngati Hurunga Te Rangi. All credit catered potentially that the Wastewater Treatment Plants being upgraded and the discharge may happen close by. That is the assumption. The strengths and weaknesses of that approach might become apparent today when we are talking about discharge.

KM – My thought about that the scattergun qualitative, is that necessary because you won't actually be able to find the indicators to do a Mauri Model Assessment at that phase. So that is the critical thing around that is that all of that is included in some sort of report and that definitions that are coined, it's not just a word and in the concept, I think it is really important that there is a definition that goes with that and even to the extent that there might be some interpretations thresholds of an acceptability, so if around a qualitative assessment of say the mana, of the like, which probably came up, is it possible to have a threshold? That sort of thing will be really useful later on.

AC – Certainly for the definitions they did spend a bit of time on the values, how they might be defined related to this project, which was quite good and maybe some of the qualitative have come through, like a range, not like a number, but we are thinking of about here, somewhere there, is where we should be aiming for.

KM – My interest is more focused on the qualitative than the physical issues because, in my way of thinking, those are the ones that will become more dominant in the iwi thinking as we get closer to try and put a consent through. The physical ones, they will cease to be powerful.

AC – We did talk about no go locations. That was an opportunity to bring out those assumptions. The iwi say "we are happy with this" as long as it doesn't go here. Most of those were all around points of discharge. Kaituna River, Iwi not too keen on putting a discharge at Kaituna.

JB – the committee has agreed that and David has agreed and reflected that I think.

AC – it was then taken as an assumption that the no go area was the Whakarewarewa Forest, that has certainly changed from the site visit the CAS members attended. Then they went up to the forest, "why can't we continue doing this" we know there is an agreement saying leave the forest, why can't we do this, this is ticking so many boxes for us.

KM – There is an agreement to get out of that forest, that doesn't mean land is out altogether.

AL – Except that what you are saying Antoine, are you saying that after visiting this specific site, land treatment system now, that that is not necessarily out of the scope.

AC – But the members were expressing a wish to revisit those.

KM – I think you are barking up a slippery slope there because you have got a treaty settlement that is saying they are out and you have got an agreement from Council saying they are out so, just anybody can oppose that based on those previous decisions. So I wouldn't bank on that one.

AC – Oh no, I think they realise that but they thought it was worthwhile to pursue it, to see what might be some of the key drivers behind the reason why that has not happened. Just worthwhile pursuing. But they have also looked at other potential land areas as well.

KM – I think the big issue there is the nutrient migration down in the surface water.

JB – If I can just put that one in perspective. It was very informal. Wasn't the whole of the trip. There were about seven of us standing around talking by the storage ponds and one of the ladies said "it may be a silly question, but if this system is not working from a nutrient point of view because it is overloaded, why can't we put less on so that it works." That started some interesting discussion. It was informal, where it goes from here, we are not sure, but Peter Staite was particularly interested in the question.

AC – So that was where we got to about. How we address that, I am not sure.

We then did an assessment of using multi criteria assessment and the Mauri model, which I recommended, and the members did not want to do that, they wanted to do a value base, so will need to come back and do another workshop.

KM – Out of interest, in terms of running the Mauri Model Assessment, what was the resistance.

AC – The main resistance was, I think the iwi members wanted to tell their story and they did not want a translation of it. There is a lot of sensitivity amongst the members about sharing any information. We have an assessment committee set up to do assessments to inform this process, but they are very reluctant about sharing information, so that is a challenge for Gina and I about making sure they feel comfortable about saying what they need to say and everyone else in this process as well. That is our challenge.

KM – that is understandable. This is actually quite common I think. In terms of yourself and Gina's recommendation to the Mauri Model MCA, what were your motivators in doing that?

KM – I thought there would be some real value in being able to find from a Maori point of view, bridging that gap between Ngati Whakaue and engineers in the decision making process. I thought there could be some real nice fertile ground in between there about translating some of their thoughts and idea that would translate well into the project, which could be effective. I was thinking about the effectiveness and then we would be able to measure some of these things and say, have we made the system better, they were resistant to that.

KM – So the issue seems to me maybe it is around how their knowledge is used and they are a bit wary.

AC – I suppose the difference between where they are and you guys is technical. It has always been way too technical. They wanted to avoid the nuts and bolts of getting bogged down in the information.

KM – It's the understanding of the CAS that they have a decision where they will understand the physical data and then they will bring in to play the cultural and physical considerations they will make a call on which is the best option?

AC – I am not sure. Members are keeping a few cards in hand I think. I think they are invested in this process with a view that they want the highest quality water coming out at the end and it is going to meet their cultural requirements, and so that is the objective, but still holding a few cards just in case.

We did have quite a wide ranging discussion around effects generally, what are some of the positive effects of this project. I needed to alleviate the fears of the members. They feel great sense of responsibility. They feel that if they get this wrong, they will go home and their communities will judge them, that they have not done the best job that they have. We had a really good discussion about positive effects that could be as a result of this project, and negative ones, but also we talked about short term, medium term and long term inter-generations, so I talked to them about examples around the country where people just like them have come into a project like this and they have improved things and then a generation later, they have come in and improved that, so over two or three generations, a wastewater discharge looks nothing like it was two or three generations ago. So it is not a pass or fail, it is improving things the best you can with the opportunities you have. It was really just to lessen the burden for them, so that they could feel more engaged, because they will just say no to everything. That is always on myself and Gina's mind. If they don't think they are engaged, they don't think they are being taken seriously, they just push the boat over and will find something that will be able to slow it down or stop it. That is all of our reality.

We did talk about measuring versus telling the story. Our members are much more comfortable about telling the story than the measuring, so that is a challenge for us. We did talk about the RMA and making sure that the cultural assessments do touch sections 6, 7 and 8 and some looked up our Local Government Legislation as well. We talked about geographics, local, district and regional, and out of that discussion came that they did not like the idea of exporting waste to another district. We haven't seen any proposals for that bit.

AL – Can you expand on that. Is it totally out of the question?

AC – The principle was that the paru that was created in Rotorua District should be dealt with in the Rotorua District.

AL – So that hasn't changed?

AC – Which comes from a more local principle, the affects you have in your local area should be dealt with locally and I have just taken that out to the members.

JB – This has cropped up many schemes another classic we both worked on was Omokaroa coming back to Te Maunga.

KM - There was a lot of iwi and hapu along that way getting a pipe line going past and they are saying, why aren't they dealing with it down there, why is it coming past our place.

AC - Thinking widely, where in the district could we have a land discharge. I think there are lots of minds focused on that. We also talked about sensitive information, how do we manage sensitive information. My view was that if you don't want to tell anybody, don't tell anybody. But understanding that information is power and if you want to make a difference in the process, you just share information at the right place at the right time. We had a talk about how we might do that. We again revisited no-go's red flags. We talked around again a whole bunch of risk and assessment methods we could use. But again, I think it came back to them feeling more comfortable them telling the story.

In our second workshop, we confirmed our objectives. We confirmed our approach to the cultural assessments having effectively Ngati Hurunga Te Rangi preparing the main assessment and others collective. Might change, it might be that they will just have an input into the first one, but that is where we currently are. We did value based assessment and there were a lot of qualitative information, preparing at the present time. We talked about some of the preferences and drivers, and I think there was a preference generally for any technology that results in high quality water. But there were some key drivers coming out and some of those were colour, smell, sediment or solids, dealing to pathogens, nitrogen and phosphorous did not really come up much at all. There is an overwhelming wish to deal with nitrogen and phosphorous but this has not come through from the members at this stage. Some of those key drivers were in human health and aquatic life. The one technology that I think everyone caught on to and it is dangerous showing a group like that, a really

nice documentary in colour and giving them the colour brochures showing how good reverse osmosis is because all the members said that's us and then they are told its expensive and they said "we don't' care how expensive it is." I saw the number yesterday and it is expensive. They just wanted to know more information about how could it be implemented, how much does it cost etc.

AL – Are they aware of the cost?

JB – That is on our agenda today.

AB – Asked for clarification on the list of concerns raised but not sure about what was said about nitrogen phosphorous, sounded like AC said they were aware of it, high priority, but they don't talk much about it.

AC – I don't think it is a high priority at the present time.

KM – What it is that they know is that the farms are having a much greater impact and so the nitrogen and phosphorous that come in from the wastewater process. Their perception is that if farming is cleaned up then the phosphorous and nitrogen loads from the wastewater are ……?

KM – Focus on the cultural issues. This project can do its very best in that regard. It's still not going to have the killer hit in terms of solving that problem. There has to bigger things change to get the targets. I think that is a gradual process form looking at Rotoiti, the small impact that Rotoiti is going to have on the wastewater compared to other potential changes.

AC - There was general agreement around regular upgrades and improvements, they bought into the idea that not everything will be done right up front, that over 10, 20, 30 year period, there will be regular upgrades and the implementation of improvements and technology over that time. That was a big thing. That probably relates to them having confidence in the project, that we will deliver it. Obviously, there will need to be conditions around that.

JB - When we put forward our TAG approach of progressive reviews and suggesting resource consent conditions that keep doors open and periodically, so that concept has been taken forward. This is something to keep in mind.

AC - We have got a couple of pragmatic people on the group . We have got a big pipe, there is wastewater coming out of it. You can't turn the tap off, we have to be real about how we are going to approach this over the next 30 years and I think that was helped in some way by the reverse osmosis discussion because people knew it was going to be expensive. When we talked about the MBR, 10-15 years ago we were told you can't use this, it is too expensive, and now it is affordable. So we must apply the same principle. Reverse Osmosis might be too expensive now but it might be some form of technology that could be used at a later date, depending on technology.

AC - Talked about discharge to land and that is a preferred option as a discharge. Preference for the status quo, or some change to the status quo. How would we address that as there are lots of things happening, tribunal claim, the settlement and then agreement to leave the forest, those are quite significant barriers. And then alternatives, which I think all of you are aware of the alternatives that were discussed.

We covered no goes again, Kaituna, Lake Rotorua, Puarenga Stream, there were all no-goes for a direct discharge.

AL – Do you have a list of alternatives that were discussed at your group, so Greg is aware of alternatives.

AC – It is a small list. This is the one that Geoff had raised, by the golf course and then the forest to the south of there, so they are the ones you would be aware of. All other blocks that were identified were too small.

KM – There is the elephant in the room, Fonterra, and we do keep coming back to this, but I think we really do need to kick it in ???. We are putting nutrients into the catchment to enhance crop growth. This is a highly treated nutrient source and we have problems disposing of it because we are not allowed to put it onto pastoral land and the only reason for that is someone in Fonterra has decreed no that is not allowed and based on very poor science, because if this is safe enough to put into the lake, it is safe enough to put onto the land on pasture. KM advised that he is getting annoyed with Fonterra because they have taken this approach that there will be no treated wastewater discharged to land. Whoever the idiot is who came up with that idea because if the water is safe enough to go into the lake then who are Fonterra to say it is not safe enough for water on the grass, that their cows are going to eat afterwards.

AL – I think with the look at what land is available, that's not taken as a constraint, so all land is being considered.

KM – But it is raised as the problem and the barrier.

JB – Happy to talk about this but would prefer to put into the Land Application basket because it is not just a scientific issue and they don't say you can't do it, they say they may not take the milk.

KM – Well that's what we need to be clear, in the past they said they won't take milk in the past now they may not take it.

JB asked for this discussion to be parked to the Land Application.

JB – coming back to where we were, no go's, you mentioned direct charge into Lake Rotorua and Puarenga Stream were no-goes.

AC – As a point source of discharge, yes.

JB – That seems contrary to where the committee was getting to. They were not that interested in wet lands or even rock passages, maybe wetlands land contact things, the Committee, although they have not resolved it, the discussion so far has been, that there is no interest in that kind of thing, so there seems to be divergent views there.

AC – The next point I was going to raise, there are some gaps and one is around the discharge configuration option. Regarding the cultural assessment, we have had this as one of our agenda items to deal with. They have been very reluctant to actually have a position on it. By having a position on it, they feel that, this is getting into the politics of it, has a support for it, whereas they want to have the focus on the highest quality discharge first and then once they have confidence there, then say this is the discharge option, that we think would be appropriate, stream, lake whatever, based on quality of the water. That is the logic of their thinking which is quite sound. However, I think we could probably make an assumption that a point source of discharge, a pipe or some type of screen at the end of it, that is going to be the least preferred. Most preferred is going to be a rock passage and gabion basket type diffuse. So that is going to be the range and those options of the pond, wetlands and other things are in the middle. That is your range, but we are unable to have that conversation until there is a lot of confidence around what is going to be the quality of the discharge.

The question was asked if a wetland type discharge would be at a higher level than direct discharge.

AC – I think you are right, you would think that however, there is a lot of scepticism about what actually is a wetland for the purposes of a wastewater discharge. We had a discussion around that. The preference is for a land discharge because there is penetration of the water into land by the soakage in the period of time goes through to Papatuanuku and then percolates out to wherever it is going to go so apply that back to the wetland, a 1 or 2 metre wetland, where 20million litres of discharge is going out every day, doesn't for them feel like it is actually a wetland, feels like it is more a pond. That is the issue. But I think the principle of a

wetland, I think would be all agreed to by the members, they are all quite realistic about it actually isn't operating or functioning as a wetland, a nice aesthetically looking pond with waters passing through and we presented options along those things. The wetland option is possibly closer to the rock passage basket diffuser and the pond is down the other end. That is the range, but cannot say which one they preferred.

There are couple of things that they wanted to have before they embark on the cultural assessment and this is going to be the contraction. They really like a base line on what is the contaminants and concentrations in the wastewater discharge, what is the quality of the water, the receiving environment on the lake and the stream and then they would like a pristine base line. Somewhere between pristine and receiving environment is their target, the range of that's where they would like their water quality to be. That's as far as we got and as far as we could get.

JB – We gave them some information on what sort of wastewater but that is on our hit list of questions and answers, to bring that data together. That will rely on Regional Council for baseline information.

AC – The last thing is that in terms of what we have been trying to do. In February, we wanted to talk about objectives and information confirming the approach to the cultural assessments, March we focused on preliminary assessment and gathering information and identifying the potential effects and what those potential effects could be and whether they are plus or minus and no quantitative assessment at all and looking towards 19 June as the date of when the assessments will be completed. There is enough time to prepare them but understanding that there are some gaps and at the present time there is not a lot of focus on the quantitative side of things, with the contradiction that they want that information before they start.

KM – I see it being an interesting process to manage.

AC – Ideally it would be great and take this information and then be able to load it in a way where we can measure it over time. But it is not going to happen.

KM – You might get some push back on that. I think maybe the way you do it, as a suggestion, talk to the different Iwi about doing their own, for their own purposes, MauriOmeter or Sudo MauriOmeter type assessment so that they can understand their knowledge will be perceived within the bigger picture of the options so this wouldn't be something that they put their rubber stamp on and say this is our analysis, so much as they do it for themselves and keep it internal to themselves, so that they can understand how their preferences will be perceived and what those preferences do actually contribute. It means they can quantify, they can compare across internally and then they can position their "telling the story" around that. Because ultimately, I think they are going to place a disproportionate focus on the physical environmental outcomes due to, sort of inconsistency across in terms of those qualitative values are and those qualitative values because they may not be totally consistent, then there will be more difficulty in getting a consensus, whereas, with the physical environmental data, there will be very little debate. That is just a suggestion.

AC – Good idea.

JB – I have a better feeling of those technical areas and I think after today's meeting, we will summarise and get back to you, that as a check list, that we are on target with the right stuff including the questions.

AC advised that the CAS members have a lot of confidence in terms of the information they have been getting. That last presentation that we had at the Steering Group meeting was one of the best presentations. That was really interesting information, both overview summary plus the technical information and reverse osmosis. All the questions they were asking were all being answered at that committee.

JB – that was a bit of a hit and miss because it was going back from one to full committees not the sub-committee, but they were good questions, real perception there.

AC – I think probably one of the risks for our members is being lost in the configurations of the combinations. I think they are getting a handle on all of the components, how they are all configured.

5. INTERACTION OF TERAX WITH SHORTLISTED OPTIONS – update of external consultants review

GM gave an update on TERAX

It became obvious when we were looking at the options that we do not have a single TERAX project here. You have a TERAX project and a wastewater treatment plant options project and so GM and Andy Bell initiated a process where we integrated two projects together because they have an effect on each other. We brought the two project teams together, SCION, Mott MacDonald, Worley Parsons, Greg Manzano, Andy Bell and Peter Dine in one group and had a workshop on the effects of the risk related to the two projects being implemented. After a series of discussions, we had Pattle Delamore Partners (PDP) in the middle. One of the two key issues we identified in the process was the potential risk of TERAX creating some colour issues to the Wastewater Treatment Plant, especially on the UVT and on the other end is the effect of alum dosing to remove phosphorous on the operation of the TERAX in respect to scaling. Those were the two major risks that we identified and in the process we have identified potential mitigation measures to at least eliminate the risk. Some estimates were developed and the colour is used about 0.5 million operational cost.

During the time TERAX was taken us, as the project disposal would go to the land treatment system it was the assumption, now we are going back into different scenario where we deal with phosphorous here. It was obvious at our last workshop with the whole group and the CEO of TERAX, we should develop a business case for the whole project as one, TERAX and Treatment Plant and they should stand by themselves compared to other methods of solid waste management. It is the business case that puts the two projects together. You do an operation and capital cost of maintenance with all the benefits of TERAX and then come up with a present value. You then have another situation where you have a separate Treatment Plant to deliver the ??? entry and then with a different method of managing solid waste. You will have to either find capital cost, operational and maintenance cost and compare together and. Compare the final quote and flexibility. That work is underway. It is being done by PDP Partners, leading the charge and with Mott MacDonald and Worley Parsons. That report will be available in six weeks. This will give us a clear picture what TERAX will do. On top of that, we have already anticipated, say, what if TERAX doesn't show much benefit, in terms of going to the Treatment Plant and then we ask the question, what would you do with the plant if you are starting from scratch, a blank page review. So that basic concept that came out to use was don't remove the carbon. That concept is being developed at the moment by Mott MacDonald and PDP. This report will come out in six weeks as well. Those two reports are being developed as we speak.

KM – Is there work ongoing on the TERAX in the meantime.

GM – It is being parked until these reports are available. This will be presented obviously to the Executive Committee of Council and they will make the decision.

AC – So effectively what you are saying Greg is that the TERAX plant stand alone has some advantages but you are not sure if it has overall advantages when it is covered with the whole treatment.

GM – the benefits that have been identified after we had identified the colour and the scaling issues will still be there.

JB – Very briefly, when we had the meeting here the other day and we had the bottles they had asked for, the residual was still there. There was actually a noticeable colour and sediment, probably more than normal, but there was a noticeable colour. The UVT of the results I have seen is about 60% which is very good.

AL – the Visual colour is not in the UVT range. The colour that you see, there is no difference in the UVT range. It's down at different parts of the colour spectrum.

JB asked for clarification. You have got this one business case running, with two options, the plant as is with some alternative sludge by solid disposal be it vermiculture landfill and the TERAX. You are running those two together. Then you mentioned if you are starting from scratch, we would not be taking the solids out, we would not be taking the carbon out, and they doing that all over America at the moment. So where does that fit in the two that you are running head to head with the business case, because that is another case. So you are running three.

GM confirmed this is correct.

AC asked if the blank sheet is a really serious proposition, because that is one that has been asked in different ways.

GM – depends on what happens with TERAX. Because our concern was if we continue adding on, you might find it is very difficult to operate the plant. The outcomes will still be the same. It will be 30 plus 3 and whatever the public health requirements are.

6. LAND TREATMENT SYSTEMS

Update given by GM of Mott MacDonald progress to date.

We tendered the work and have engaged Mott MacDonald but our procurement guidelines are such we went for tender that's why it took us longer. We had the same results so we had three tenders, but in the end it was still not economical to get any work anyway. We had our first workshop with the consultant on Thursday. The process for identifying the potential options that came up with, are what they called a list of constraints criteria. We have not agreed on that yet because it is still being developed. They just started with the work 2-3 weeks ago and what we did was we came up with a preliminary constraint criteria and applied it to the whole plant with layers of GIS layers. The general area still has to be confirmed. What came out was whilst the general area around TIkitere from the SH turnoff, there is an area of land. We haven't ~~to~~ come to the ownership details yet, we will just see what we come up with this process. It showed another area about 5-6km away from the existing land treatment system and there were discussions about maybe we can approach this, if it is going to be possible, maybe we could approach this as the existing land treatment system as the reserve area. If that is the case, you don't get rid of existing asset. The other one is an area around the proposed cemetery (opposite the Lakeview Golf course.) However, this is about 50km away from the plant, which is expensive to transport from. Most of the areas that have been seen as potentials, are around 10km away. We will ask the consultant to look and see if it pans out technically. They are now refining the layers and they might come back with a preliminary within the next four weeks hopefully.

KM – Looking ~~past Anton~~ on the topographic relief model there (on the wall in the WWTP meeting room), those areas you talked about are already in forest aren't they?

GM – No, the one by the cemetery is a mixture of dairy and forest.

Members went to the wall map and discussed the potential areas.

GM – When all the information is finalised, this will be brought back to this group. What was asked of us was are we going to zero in on one, two or three areas. What came out of that was that three areas would be looked at. Greg was happy with what was achieved.

JB – asked if this information to come back to our next TAG meeting on 22 May.

JB – referring to Fonterra, as JB understands it, Fonterra put out a Memorandum of Guidelines some years ago, and have updated it a couple of times. This read as "if you meet a Californian Item 22 Treated Human

Wastewater, we may not necessarily take your milk. Title 22 Californian Wastewater had a total coliform, not a faecal, a total of 22 median, so it is a very stringent level of disinfectant and they have kept that position and our understanding is that it is substantially based on market image green, clean and overseas markets, not on the science and the public health. They have then in more recent years, although it is a while now, extended their policy by products from land application of human wastewater hailage and bailage. That is a very interesting exercise, particularly in the Taupo scheme when you asked where it goes, that they will not necessarily take those products that have been grown on treated human wastewater that is less than a double 22.

The last part of the trifecta in recent months of last year is that they put a letter out to every Regional Council in New Zealand asking to be informed of any applications or land application where it might be near dairy or hailage or bailage.

AL – This is still only products off the land that would be fed to lactating cows, so it does not preclude growing grass and feeding it to non-dairy animals.

AB – Do we have an action to enquire at least what their position is right now and more specifically, because it seems you are working from some notification some time ago and should we make an enquiry and ask what is your position now.

JB had a question for Greg. In terms of the land application, is the option of periodic use on golf courses, city parks, is that in the basket.

GM – This will be dictated by economics, so still on the table. What we are doing now is looking at the big picture and if there will be specific areas within the city where it could be used, then it will be dictated later.

KM asked if there is an industrial potential, industrial users that needs a lot of water, its pretty high quality water.

JB advised that he would like this kept on the agenda and discuss later. Picking up on that, I would like to see us, as TAG, be mindful of the beneficial reuse industrial reuse option and probably as we wrap up our exercise, somehow put forward to RLC and the committee that they keep the door open proactively if some future user comes along in terms of that future policy because it gets pretty good sustainability. We are still hoping the get the New Zealand refinery off the ground with 2000 cubic metres a day from Ruakaka WWTP, that will be New Zealand's biggest, and that is a pretty useful plant in the consenting to have that one on paper.

KM made a recommendation for the committee for the technical advisory group to consider, is that we send a letter to Fonterra and we actually ask about these stipulations given the latest one that has come out of and close proximity or otherwise, and we ask them how those concerns that they hold in regard to human waste, whatever effect there is, how those taken into consideration with the Tauranga?? Dairy Factory and I think if we can get an answer back from them, that would clarify a lot of things for us because they have got a much greater risk going on with the water they extract from the Waikato for use at the Dairy Factory at Te Rapa, that is one of their biggest plants in the country. Tokoroa, Cambridge and Hamilton all have pooh in the river. It is all human waste treated.

AB – I think we need to get an answer as to what their position is, don't we?

KM – That will get an answer because if they take out a high and all mighty position, they have to justify how they are taking water out of the Waikato River. I think it is a valid question to ask them. Fonterra are actually hypocrites because they are using water not treated once, probably 3-4 times by the time they get it and they are using it in their milk processing.

AB – Can they not answer that by saying we take water from the river and we put it through a treatment process that meets a particular standard. Whereas presumably if they are saying they need to meet a particular bacteria of standard onto pasture, then that is being based on something, may not be strictly scientific criteria but it is some criteria they base it on.

KM – I think all they are doing is exposing their hypocrisy and stupidity, because it is not based on science. What they are doing is taking a position that is based on some marketing person that said, we can't possibly be associated with this. Let's wake them up.

AL – I don't think this is our role to take position on exposing their hypocrisy.

KM – the other problem for us getting a solution is that they are issuing these decrees, they are national decrees, thou shalt not put their treated wastewater onto pasture, thou shalt not put on pasture adjacent to where our cows are eating.

AL asked if we want to address this now or do we want to address it if it becomes a constraint on any of the land that we have identified.

KM - I think it would actually help a lot of projects in New Zealand if this was something that was resolved because it is not only an issue here.

JB – We have got to the point on RLC letter asking for an update on the current status and the background to that and I think that's as far as we could go at this stage.

KM and members agreed a letter to from RDC to Fonterra.

AB referred this question to Greg. Mott MacDonald is looking at alternative for land disposal, are they costing through or are they going to present in a comparison that what the existing land disposal costs to run?

GM – Yes, we can do that. This is a Business Case of staying status quo.

AB advised this would be helpful for us and the Steering Group and will include in that the life of the asset you have got there.

DH asked if none of those options used as existing ponds?

GM advised that they have not come to this point yet, but assumed if some sort of volume accreditation this can be very useful.

AB - There was concern expressed on Greg saying 30 plus 3, and not sure whether this is a correct target or not, 30 seems to be the correct target in terms of nitrogen, but there is concern that if we say 3 for phosphorous, we are expecting a lower standard than existing standard and why would we accept that, particularly when we may think getting enough nitrogen out of the caption is going to be really hard job but my understanding is getting enough phosphorous out of the caption is going to be a harder job. Not sure many people are recognising that and so I just want to ask the question what are the targets, and is this something that TAG should be involved in.'

Again he numbers that I quoted were based on the old consent.

AB - My argument would be you have not always complied with the nitrogen limit. I think you have always complied with the phosphorous limit, in fact, you have complied with the phosphorous limit very well for many years, I think the worst it has got to is 1.5 – 1.7. Definitely below 2.

AL– Aren't we looking at the practical options and then we will evaluate them based on what they can achieve, because even though the target is a 3, we know that we have the possibility of reaching below 3 with some of the options, so that will make them a better option when we evaluate them.

AB – I would be happier if that was there in our objectives, but seems that we are assuming 30 plus 3 is our target and I would like to ask the question around that.

AL – Do we want to formalise an objective.

Again GM advised he is going by the old consent.

AL – Ideally, our objective would be to achieve less than 1.7 for phosphorous.

AB – We don't want to just simply say, once we are under 3, that is the solution, we need to realise that if we find the solution is 2.8, it is not as good as where we are at the moment and think, are we satisfied with that and what are the options?

AL – I think also it is coming up with an option that has the possibility as well as achieving less, like throw in more element and achieve this, compared to one that, well that is as low as you can go. I think it will come out when we evaluate options.

GM? – in terms of designing the land treatment system, re. the upgrade, if we are going to do a water base, you are looking at a range between 3 to 1.7. In terms of the land treatment system, the design will be governed by hydraulic loading and obviously there will be some corresponding. They are targeting at 3. I am assuming at this stage that because the hydraulic loading will ??? the design that they will have more area than what is required.

AL – Where are they dosing in Palmerston North, whether we do tertiary treatment, whether we limit where the alum goes in or whether we dose in secondary, or for anywhere in the plant where we have got much wider range of options you can get your lower levels, so perhaps that is worth considering too.

AB – So if we follow along with what Alison suggested, is that the wording that we should be thinking about is aiming for, at least investigating processes that will achieve the same level of phosphorous reduction is what the land disposal is achieving now.

AL – And Option 3 does for example

AB – It doesn't mean you are going to end up necessarily there but at least you know what's the cost of getting there. GM advised, it is all in the MacDonalds Report.

7. DISCHARGE TO WATER – FIRST CUT DISCHARGE SITES LOCATIONS

Refer to document.
GM and AP gave an update and referred a hand out Table1: Potential Discharge Sites.

Referring to Site No.1, Discharge pipe to run on the south side of the existing holding ponds (adjacent to the existing holding ponds) It goes into a wetland before it goes into the Puarenga Stream. You could have different discharge configurations there.

AB asked about the descriptions, two of the discharge options for No.1, pipe direct discharge to lake, it is actually to the Puarenga Stream not the lake?

GM – Correct, not the lake.

GM asked members not to be too concerned about the second column, this is just a configuration.

No.2 is also discharged to Puarenga.

1 and 2 are just adjacent to the existing WWTP so we could gravitate.

Option No.3 is where the proposed tertiary treatment will go and then the idea was to take the discharge from the tertiary and gravitate it into what we call the existing emergency overflow. Then it goes into the lake. Site No.3 is a natural water course leading into the lake. They have very low flow.

DH – so this really is the direct discharge into the lake.

AB – It is actually a natural water course and would have a very low flow.

Option No.4 is beside the Te Ngae bridge. The only reason we picked that up is that if they allow us to go here we can use the existing main, cut the existing main and go straight through.

AB asked if that is they only real advantage of going up to there, to No.4?

GM – it is just making use of the existing main.

AB thought they were make use of the alum dosing plant

GM and AL thought this was a good idea.

GM – We have not gone into detail on how to go into the lake but have identified what will be the pipe line configuration if discharged into the lake and have identified potential too, called longs point, which is sites 5 and 6. The blue line is option 5, which will go through a Paper Road. It is not formed but not have to go through a major easement process. Site No.6 is the yellow line through another Paper Road.

AL asked that with 5 and 6, is there enough land at both points to do rock/residual gabion diffuse of a discharge there?

GM advised that within the reserve there should be, however we have not gone through the details. The maps are showing the possible pipeline roads that we could take if we go into the lake.

KM – the blue line where it runs down towards Vaughans Road, wouldn't it be easy to run that straight down all the way to Vaughans Road and then just have one bend going into, because it is the same distance. I'm just wondering if that dotted line where it zig-zags through the residential areas deliberately going between two marae.

GM – We are just following the roadway. This is just a first cut. We can look at this option.

AB – The question I have on this is how does that interact with the work you are doing David.

DH – We spoke earlier that no direct discharge to the lake, what we do perceive is my first question. It seems like 5 and 6 are direct discharges to the lake and it seems that No.2 is that as well given that you have no continuation through. I am happy to be guided on this but don't want to have to do a lot of work on some options that are already off the table.

AL asked DH that if he was looking at the input into the lake, would it matter if it was at the end of a pipe or if it went through some gabions or rock passage.

DH advised that maybe a little because the three dimensional modelling will identify any effect that the plumes and so what we will do is probably put a dye tracer it and look at the dilutions that die tracer as an indication of where any effect contamination might radiate out.

AL – so you would need to know width, depth speed.

DH – from a human health point of view, would definitely want to take a look at whether there were issues around the spread of those, in terms of people swimming, potentially at site 6. We would still do the same for site 2 as well.

AL – So are we wanting to consider narrowing the scope by moving a direct discharge and assuming a rock passage to narrow the scope

DH – Minimally, I don't think you would take a lot out with the gap.

AC – I think the big question is a macro and micro thing isn't it. Isn't your work David initially to say where generally in the lake if you did discharge would it impact. That is like a macro thing. So it wouldn't matter whether it was site 5, 6 or even down the stream, you are going to get a story as to how that impacts the lake, how that might mix and then you have got this micro thing where you look more closely and if we decided that if the best general place to discharge was inside Sulphur Bay as opposed to Tai_____channel, then you can look more closely at that. I wonder if this is a two stage thing that we need to do here.

DH – Well it is sort of 2 stage. One is that we have used one dimensional model and so the exact location might be important would be basically what hits the lake. What we are looking for there is long term changes. With the others where we are using three dimensional model, what we want to do is look at locations specific aspects and primarily use tracer to where the wastewater is being dispersed.

AL – So if we were to look at these sites specifically that would provide the sites for your 3D modelling work.

DH – Yes, this is useful but I am just concerned about doing a whole lot of options that are off the table.

AC – Just to reconfirm what I said earlier, there has not been a lot of time spent on the configuration of a discharge point because there has been more of a focus on water quality, but I think we can make a sound assumption that a diffused indirect discharges having been more preferred than a direct type and part of that is the perception of a history of hype was wastewater and terrible things coming out and going directly into water bodies, so I think there will be strong opposition of there being a pipe going into the lake. The way that you do is going to be the less preferred in a diffused rock passage which is going to be higher up the range.

KM – there may be a need to be more pragmatic on that one Antoine. Just looking around public health potential problem raised David, people don't swim at Sulphur Point because it is too hot and I wonder if that is an inherent safety with regard to having a discharge. People don't just swim at Sulphur Point, people don't go walking around there either, so whether it's a pipe or its got gabions around it, probably makes very little difference because nobody is going to be able to get there to see it. Maybe the pragmatic thing is because I know that if putting in Sulphur Point is going to more technically challenging (in engineering terms) and putting a basket a dispersing thing on the end is not going to simplify it. So the engineering can be quite tricky.

The question was asked if anyone knew of the decay rates in the lake.

KM – Is the thermal activity actually of benefit in terms of the treatment.

AL - Remember Sulphur Bay is a wild life reserve too, so it would have some particular status.

The question was also asked if Hinemoa Point was identified as one of the no go areas. Of which Greg answered "no."

JB closed the meeting for lunch and thanked Anton for updating the committee.

Kepa gave retrospective Karakia and blessed the lunch.

The committee broke for lunch at 12.10 p.m.

David and Anton left the meeting at 12.10 p.m.

Meeting reconvened at 12.38 p.m.

8. EFFECTS STUDY UPDATE FOR DISCHARGE OIPTIONS TO WATER - Waikato University led by DH

JB - Further update on the Effects Assessment which comes together for our June meeting as I recall. If we can pick up where that discussion was going. Chris and I were just looking at the phosphorous __ total levels and that was interesting. We got to the point that we were discussing out here and the landfill, the sulphur, the temperatures, some interesting points come up on both, bug kill off, wildlife reserve verse the other discharge points and we have not really talked about it in views of out into the lake in the basket at this stage, we only went as far as if you were doing that here are some locations, you could take off from.

JH asked DH on when he presented to wider committee, you had those mixing contours and you played those under different conditions and I have always been thinking that stuff is going to be a pretty big potential driver on where we might go. Can we pick up that discussion, status where you are, what more you want from TAG.

DH reminded the committee that the person that is doing a lot of this work is Jonathan Abel. He completed his PhD on the lake, Puarenga in particular and Ngongotaha about two years ago. He is a highly confident guy. He gave David a brief update. David would like to open this for discussion.

DH provided him with a huge amount of background on this project and just a few emails from Jim. He has obviously identified the Mott MacDonald report of November 2014 when it was in draft form as the most relevant to that he wanted confirmation that it has been finalised. David has replied back to him on this.

Chris is involved too and has made request for the hydrology and water quality data that is required to set up the models and that has gone through the BOP Regional Councils and Jonathan advised David yesterday that it had just come in.

This week he is planning to combine specifications of the scenarios in the Mott MacDonald report with the water quality data for the nutrient models to consider the scenarios. I think any discussions we have around those today would be very useful. What we will do, is run the one dimensional model which is suitable for long term simulations, we have got a lot of experience with that, to look at basically how nutrient loads impact on water quality in the lake and we will use of three dimensional model to look at how for example contaminants in the wastewater are disbursed as they come into the lake, so as long as people understand the combined combination of the two. One of them to basically look at primarily short-term transport and the other to primarily look at long term impacts on lake water quality. He is planning with the former, the transport model, to look at it under typical mixed and stratified periods in the lake, the dynamics of those can be quite significant. He will probably run the effects of summer condition in the winter condition to look at the relevant transport contaminants. He seemed well on top of the scope and obviously he has read all the emails Jim, and because of that, he has been well informed.

DH advised that what he would like to do is, you have got the options put in front of us this morning with regard to the 3-D Model. Are there others that we need to consider in other locations and the other aspect is around what of the nutrient, so that is the transport one and other one is around the long term model approach, in which we will actually need to get nutrients, nitrogen and phosphorous being delivered at the point for discharges to lake.

AL asked if the Mott MacDonald would do that.

DH advised yes but not through the Puarenga. This is the scope of David's work to look at this. It will also impact on the stretch of the Puarenga.

JB advised that there is a pipe that's there that is sufficient.

DH advised yes.

AL did say however exceptions for locations 1 and 2 which go into the Puarenga, concentrations are different entering the lake.

JB asked DH if he would be making that judgement in terms of the RMA in the Puarenga. You will be modelling those levels of comparing with NPS Freshwater Management and things so that has a bit of bearing on just a pipe verse diffuser.

AB – This depends on the two things, one dimensional modelling ____??_____ gets the answer really isn't it.

DH – there would have to be some work done it will either be a simple model or what the attenuation of both dispersion and attenuation of the wastewater at the Puarenga.

AL – because it might be quite useful in that 18 month period where we have still got nutrients coming from the Land Treatment System, will you consider whether that after reasonable mixing (however, that consent runs out 2017.)

DH – We are in a fortunate situation now because Wongs work, she has actually done simulations with taking away the current forest wastewater discharge, so we know actually that it gets right down to its basic levels within about a year.

CM –The effects though, how does that interact with the presence and what absence of Alum dosing?

AL – Would you do an scenario with and without Allan dosing.

DH - I think we would have to. What interest me is we are tossing up whether to Alum Dose at the Wastewater Treatment stage. We also have an Alum Dosing protocol where we are managing levels in the lake by Alum Dosing, we are weighing up whether we do it here at the start of the pipe. If we don't do it there, we will just have to do it is in the lake, an interesting balance.

The in lake protocol is to maintain the total phosphorous in more or less the second level in the lake and so it does not matter what the outcome is. In terms of what happens around the land, they are just regulating and what the final outcome of the lake.

AB – I meant to bring demographics on that, but in the recent summer it has gone well out of control because the lake, as you know, stratified the longest periods you could imagine. So phosphorous levels have gone high.

JB – Regarding phosphorous dosing's you are doing in the streams, but isn't there a question on how long that would stay in terms of consents and in terms of cumulative effects, somewhere in the project we will have to consider with or without that continuing in terms of cumulative effects, won't we.

DH - we certainly run the scenario in 2017 the consent runs off and as far as Alum dosing in Puarenga Stream.

AB - 2018/19 they come off. The Regional Councils plan in the 10 year plan is to continue with Alum Dosing. So we will be going for a renewal of those consents, but what happens with RMA.

AL – but they still out of temporary might be another consent.

AB – The protocols around keeping in lake phosphorous is between 17 and 20 parts per million and so we changed the dose rate, depending on what phosphorous does in the lake and we have been reasonably successful at it but when you get big stratification period then you don't know if phosphorous is going up because it isn't really.

AL – is it based on surface phosphorous concentrations or below the stratified level?

DH – I know through the protocols, I think based on service concentration. The Regional Council did go out with samples at the time, stratified, we knew it was building up.

JB – Going back to David's question, we have answered what the options got, you talked about the _____ effects, you had a question about locations. Just before we go back down, I just want to come back, I cannot remember your brief that well. There was something about you are doing assessment against the NPS Freshwater Management in terms of loading in there and other guidelines, aren't you.

DH – The MBS would be the national objectives framework and that would only relate to point source of discharge. I will have to check that.

JB – We drew up a table and took it to the committee and they thought this was great. How are we going to compare with what will come out of your model with various standards and guidelines. I just want to see whether how far you are going. The ones that are really tripping us in other consenting projects, having just done the Matata Environment Court Hearing with Judge Smith, he really got onto this ~~and got three consents now, where would we want where,~~ The water quality objectives of MPS is starting to worry us and the life supporting capacity, so we have got to address that. Safeguarding the life supporting capacity, wherever we are going, somehow got to measure that. The Palmerston North case where we just had a hearing on ~~the Environment Court Hearing,~~ we spent days arguing about no one has defined life support capacity and the other one is the overall quality of fresh water within the region is maintained or approved, so that where someone will put the ruler on us and say what we have got tonnes of nitrogen now after the forest. ~~and why 1.7p, how are those coming up.~~ Are we maintaining overall quality within the region maintained or approved so there are two big rulers in there, so I am just really asking or flagging how you are going to go to answer those because otherwise, who does answer them, the Planners will have a go, but they need data.

JB advised that the Manawatu decision is with a hearings panel, not a Judge. Where Judge Smith went was, with this new NPS, we had not done enough homework on comparing what septic tanks are doing now in terms of the discharge contaminant, particularly nutrients and bugs. What we had done all the work on is the discharge of treated/well treated secondary plant effluent on some sand hills that actually comes inland into some drains and he was saying we should assess improvement. The great news, in terms of Rotoma and Rotoiti we sat around this table and drew a bunch of septic tanks and different treatments bar charts to show that the improvement because it was nutrient driven. Matata was all about public health issue and the government said, here is the money, go and build a sewerage scheme, so it is this improvement thing that he said he had not seen enough evidence.

DH – One of the difficulties of Puarenga, its life supporting capacity is basically and I am not sure we have got an objective measure as such from a scientific view.

KM – I follow the concern. If they do their own internal one that may give them some more confidence that you share them, but it may not either. If they do their own internal ones, there may be a bit more comfort because a lot of them won't have used the Mauri Model before. As far as we are concerned, we are going to have to quantify what they come up with the CIA's anyway otherwise we won't have a rational way of including this.

AL – So rather than evaluating, what do you suggest as a measure of the life supporting capacity, not all the other attributes, but how do we deal with that one attribute.

KM – I think it is not just one indicator, I think it's going to be a number. In terms of the discharge we talked about, David has already raised public health, so we identify what that indicator is going to be.

AL – so you would start with the broad set and narrow down to what were life supporting capacity indicators.

AB – Council has done some significant things to improve sewage from 150 tonnes of nitrogen reaching that lake to something like 30 tonnes of nitrogen reaching that lake, so isn't that part of the story, that's the big improvement, because I was looking here (referring to a document), the 435 tonne target, and what does that comprise of. I have to go back to our Planners and say "have you ever added this up" because they are working from the other end, they are saying, how much do we need to reduce this one, that one etc., and they are starting from varying targets, depends what model you use to what target you are starting at. Wouldn't it be simpler if you we knew what each area had as the final line. What do they have to achieve, so say sewerage achieves 30 as their target, that is how much they are allowed, rainfall has 30 coming in, forestry has about 70 coming in, probably cannot change that and we have got 280 coming in from pasture. That is if we get down to 435 and then there is an urban lifestyle allowance there. AB asked Jim if this helped in context as to what the whole plan is about, so that is the whole plan around restoring Rotorua lakes and how does this fit into that plan.

JB – Yes, it is a great story to tell. The interesting thing will be, what have you got now and what is proposed and that will be marked against that improvement over the area, the catchment and the fact that you are coming from 700, down to 485, that should get a huge tick, but if they start getting picky, saying that in terms of the sewage now after the land treatment area, you are doing 28 and you want 30, where are you making up the difference.

AB – I think what needs to come in there is that you have got to tell the story, what's the history of Rotorua ~~sewerage~~ and also think about the future. So Rotorua has got to have some capacity.

JB – You think for 35 years, one of the smallest increases I have seen. Tauranga and Hamilton were double 35 years in our projections. There is a great story to be told, but you have got to start now that the benchmark will be now, not when you had 137.

AB needs to go back to his planners and say, how is this allocated.

AL – when you are looking at the life supporting capacity and improvement, surely we are not just looking at the lake, we are looking at the land, the Puarenga and everything else, like we are reducing our impact on the forest, so surely we are taking everything into consideration.

KM asked what the change in the life supporting capacity of forest by not discharging there?

AL - The percentage of the land that we have probably increased the life supporting capacity on and a percentage of the land that we have definitely changed the eco system from productive forest to more wetland.

JB – We need to be very mindful of those two policies.

At some point, we are going to have to figure out a way of doing an analysis of the complexity that this imposes not just in terms of the isolated changes that can be defined between the different options but in terms of the overall picture of what is being achieved and to do that, we need some processes to make sense of it, which might have been MCA, might be the Mauri Model, but we do need some sort of means to work it out. If we use it as a guide to identify some of the fishhooks, it is going to be useful because with the CIA processes they are going to be done earlier this time, but referring to what Antoine said, they are holding their cards close to their chest because they want control on what the outcome is, so we need to attempt to at least try to read where that is going to go. I think my input can help that. I think the Kaituna being out well before they come back, and some of these other things that are coming up, I think we can have an idea of where it will go and probably a better idea if we do some sort of analysis so that when presented, we have a better chance of getting over the hurdle.

JB – I think maybe we can't pull it all together till that meeting in June, when the effects is through, this will go back on the agenda for the next meeting and we get more information together.

JB – Going back to David's first question about locations and further directions.

DH advised that it would be useful to have the other locations discussed today being the Ngati Whakaue land.

AL advised that they are a month away. Greg confirmed that this is correct.

AL advised that she could probably get a general location of the three for David.

?? advised that Hinemoa Point is not being considered from a cultural perspective for a discharge location.

KM raised the work that NIWA did, which David is aware of. Printed copies were made available at the meeting. This was 2010/11.

It was asked if all of the options here are on land or on the edge of the land, is that the reason, or is it discharged within the lake, away from land a no go. This is what Antoine said, but this was drawn before Antoine gave us feedback.

JB asked Greg about this the other day. Jims understanding was that if one was on the lake, could be launching point for an offshore diffuser, if the effects study showed that to be a very desirable thing to do.

DH – this almost goes back to the Brisbane case, actually whether they considered a diffuser discharging into the sub-surface and into the surface. There is nothing to stop us doing that, maybe something different from a discharge on shore. We could do that. David is a little bit wary about long simulation after simulation. Johnathon will come up with a list. David will advise the group of this list.

JB – If we are not doing it, I think we need a documented reason why we are not looking at it pretty soon. If we are looking at it, it comes out in the wash and the assessment.

AL – we have eliminated out of catchment and eliminated Kaituna, on the basis of the cultural assessment advisory group, they are advising no direct discharge, do we eliminate it for that same reason.

GM advised when we say direct discharge, it's a pipe, not a diffuser.

JB made a comment of running it through to the rocks and put it back in a pipe.

AB asked, why couldn't we put a pipe out into the crater, just past Sulphur Point, deepest part of the lake, is there a particular reason why that would or would not do that.

DH – It's a question of being quite clear on where we are going to discharge points before we do 20 different 3D models.

JB – Having consented many New Zealand offshore outfalls, the consultation I am sure will bring up someone asking, why aren't you looking at getting out in the lake. So what is the process, do we go back and get a statement from the cultural committee through the main committee on whether an offshore diffuser would be an acceptable option to model, we do that first.

KM – One of the things about the ??? meters, you have got some flow over solid media, doesn't do anything, but it is like having an open channel or overland flow. Having a pipe discharging whether it is through the diffuser, I don't think you will get the same perception because when it is going out of a pipe ??? diffuser, I don't think the inspectors will give it. What if you put it through some sort of media and then through a pipe again to get it where you want it. What is the feasibility of overland flow.

JB – we did have an overland flow in a very early list we drew up and it didn't come through the Mott MacDonald report. JB to check this.

A question was raised, you have got a really clear basis why the decision of not bother with the Kaituna was there, was the Waitangi Tribunal ruling on that and so therefore, therefore, if we were asked why we didn't do that, I think we would be fair in saying it just didn't seem very sensible barking up that tree again so if we then say why didn't you look at putting in a diffuser in the lake, we shrug our shoulders because we haven't got any particular reason not to test that. Doesn't that give us the opportunity, we run it and then if the community, the CIA or the Steering Committee say that's a terrible idea, we say, we didn't follow it any further because ???. Putting it in is just going to put it in the basket of questions.

JB – In terms of the alternative assessment, we have got to have a good reason upfront. If you do look at it, if there is a significant water quality lake advantage, well that will come through if there is, and at least we have looked at it ~~and then at least we have looked at it~~ and then it gets knocked out, isn't it a lot of extra work. We have got to make a decision here, whether we go back to the committee now, the main committee, or you include what you think is the most obvious offshore with one in the basket.

I say include it because if you don't and you have the locations there right beside the shore, initial perception is going to be, I know people don't swim where any of those pipes are, but if the current runs up the shore past Hinemoa Point, people do swim there, and so there is a high likely factor there is going to be some potential problem. If you don't look further out into the lakes, saying well that's away from where people swim, you are shortcutting your options.

JB – yes and you have got that whole advantage of initial pollution thing.

CM – What about piping it to the middle of the lake and then having a trigger when the lake stratifies you pump air into the flow as well and then you can sell it to the community as an aerator. This could be an option.

JB suggested that unless there is a contractual difficulty, we leave David and the team to find one offshore location that may have some lake water quality advantages and then get in touch with the committee on the costs that are hopefully, not out of the world.

KM – We have got a pipe that runs over to Vaughan Road, along Vaughan Road and then back out, what are the technical issues with running out through the geothermal area right here (referring to a map) because it is must shorter.

GM – It is going to be dealing with corrosion of the structure. There are ways around it. We could probably use the new PCB, pipe clay which we have been using at Whakarewarewa and Ohinemutu. However, it is very expensive. Stainless will not work.

KM – So the issue then is that an open channel is not going to work as it doesn't allow you to get right out into the lake.

AL – We have got the offshore discharge, David will come up with a location. We have got the ones that take us to the shores and we have got our land treatment ones, are we still questioning the possibility of a rapid infiltration or some other rapid discharge to land location. Where are we at with that?

GM – the brief for land was based on a convention irrigation system. I cannot remember why we did not go for rapid infiltration. It is one of the discharge ones for water discharge.

AL – So we probably have the cost for rapid infiltration and we have a cost for piping but we probably haven't covered off the location, if we were going down that track.

GM – If we are going for rapid infiltration, we are looking for a site that wouldn't be too difficult because you are dealing with just 30 hectares.

AL – It won't be difficult to find, but won't David need it or will it be okay with your 1D Model to not be specific.

JB quoted from the document that Mott MacDonald did a rapid infiltration option in their Report estimate of $40M and 10 hectares.

JB advised yes, however, it hasn't come through, but nor has the committee actually gone through these one by one.

AL – Just anticipating that their preference is for land treatment, should we be considering it.

JB – Should we be praising them of that option.

9. ADD-ONS TREATMENT TECHNOLOGIES TO THE TREATMENT PROCESS OPTIONS

Jim requested a resolution out of this around with an agreement around TAG to take back to the Committee on how we see the add-ons, how we may or may not be able to accommodate something in the future that keeps them open.

(i) Indigitech

Alison advised we have these add-ons here, the Indigitech by Eight Associates Ltd, which is Victor Main, that we have had correspondence with. That is the technology that Wally Lee and Peter Staite bought to the table. It is a black box, we don't really know what is in it but it appears to have layers that are absorbing and it has some back flushing and we have been told that for an estimated $5M they could provide a system for the Wastewater Treatment Plant. You can see the expected performance, all we have is what they claim will be removed, we don't have any evidence of anything. That is where we are at, we really don't have any information. Their thought was that they would be building a plant that could

be used as a pilot plant for Council's sometime during this year and we have had no further correspondence from them on that. The date of this correspondence was late last year. Alison to include the date of that correspondence on the paperwork.

AB - The question was asked that when you get to things like that, when they are saying that process secret for Intellectual Property protection reasons, isn't there a way that we could get through that with a confidentiality agreement.

Alison – I am sure there would be because the issue isn't only the IP with this one, the issue is that there is nothing operational, there is not even any evidence of what can be removed.

??? - There are pretty simple processes. They can lodge a provisional patent for one year, and during that year, they have to provide all the details and make that a full patent and at the same time, that provision year, its able to be challenged by anybody else that is already patented with the same idea internationally. How long has this been on the go.

Alison – over a year now, almost two years. They have other technologies that are taking their time and I think they have put this one to the side to deal with other pressing things.

Alison concluded by saying Indigitech is not developed so we will have our generic response for that, which will be considered sometime in the future when it is developed.

(ii) Biochar and activated carbon

We know activated carbon, carbons used in filtration media removing colour and absorbing ions. Why it was bought up here is because there is very likely going to be a pilot plant built that will produce activated carbon locally, whether it is more like fire char, or charcoal or activated carbon, I am not really sure, so we have no idea what the quality is going to be, they haven't decided on the process, it will be from forest residue. Regardless of whether we have a plant here producing activated carbon, there is a question about whether we want to incorporate that activated carbon into a filtration media is standard filtration medium and Mott MacDonald looked at it for removing colour from TERAX. That is one of the options, so we need to make a decision how we want to progress that.

KM – I think you will need some help to move on that. It's a case of writing them a letter to Indigitech saying this is our time frame. So far you have told us this and unless you tell us by certain date, we simply cannot move any further on that, and that is the finish of it.

Alison and Greg advised we did that, sent a letter to everybody and got no responses, from anybody.

KM – I think we just need to be really clear on that so people who are on the Steering Committee or in a community and ask about these things, why haven't we followed up on them, you want to be in a position to say that we have followed up. Possibly send another letter to Indigitech being clear with them on the timeframes.

Greg – we gave them a deadline of October 2014 and advised that we would make a decision by October if you do not give us any information, that's it, we will not consider you for anything further. We have not heard from them.

KM – My suggestion would be to ask the question, put it to them so that they either respond or don't respond and then you have got a clear defence for not going any further with it.

Greg – Are we going to consider all of this, are we going to spend a lot of time on this because most of this technology is still in research and development. My suggestion is why don't we set aside and say,

yes we know all about those, we will consider them in the future, if all of them are widely used and we could put consent conditions on the resource consent that will authorise the project to look at this at a later stage and ask improvement to whatever we have by that stage as long as they are at a stage where they are widely used.

JB – just to elaborate on that, we have done that. Number of more recent long-term consents we have got we have underpinned with the consent holder, Rotorua Lakes Council, undertaking a periodic review, usually tied to every second LTP and you can in that state the technologies that you will look at, amongst others, so that puts the ownership on Council, who will at least have a look at it. Periodically, these things if they are not up and running to a commercial viable stage at this stage, it keeps faith. The great thing we heard from Antoine today is the timing roadmap approach, it is an acceptable one by a hearing, so that would be the way. Otherwise if they are not up and running proprietary wise and cost efficient at the moment, we know enough, we are just going to be spinning our wheels.

AL – can we come up with a statement that says when and at what point in time we will consider technologies and if we have an agreement, then I can forward this through to people so it is only things that are proprietary, up and running.

DH – I am a little bit worried that this is a tip of the iceberg, we need a protocol.

GM – We can go back and write the letter saying this is your deadline. But what they will do is they will respond and say within the next three months we will give you an answer. There is no end to it.
Greg asked for a resolution on this.

JB asked AL to continue going through the table and see if we can get a resolution that we take forward.

AL advised that Indigitech is not developed, so we will have our generic response for that, which will be considered sometime in the future.

Activated carbon is already out there and is included in filtration media, so it is just a matter of whether we are including it in our filtrations options and when we need to.

AB – My question would be, “so what are we targeting if we use activated carbon and why?”

Alison advised colour, if there is a colour issue. This will help with UV. But we don’t actually have a UV transmittance problem/issue so we know that the UVT is high enough, so that is not an issue.

JB advised not to be concerned about micro pollutants.

GM advised you will have to look at it against BNR and MBR.

JB advised that when you get to the questions, part A, a question was raised last week about it, how it is applied. It is one I think is still on the table in some form or other.

The question was asked of David if nitrogen has an impact, but probably not a very big impact, would that be fair comment?

ALISON, DAVID WAS VERY FAINT HERE. YOU WERE GOING TO LOOK INTO THIS.

(iii) Microvi

Again, just changes the niche that the bacteria grow on, so it is biological improvement on biological treatment process, it will be doing the same as what we are already doing but slightly more efficiently or with a smaller footprint but we are already set up in our designers configured for the secondary treatment that we have, so it does not look like there would be any point considering that as an alternative.

DH ??? my understanding is the only place it might be if the magic way they think they could do phosphorous come through, watch this space, that's about it.

GM advised that again, it's not developed.

JB advised of a couple of emails he received from Warren. (Jim to forward to Alison.) Jim asked if that the one that they were came and got the sample just before Christmas, they took 20 litres or is that liquid media operations?

AL – Liquid Media operations they are the same principle as Indigitech. I think that may have been where the Indigitech concept came from. They do have an IP, they have a plant in Southland that is still in the testing stage. They want us to sign a confidentiality agreement and suggested that we either send 20,000 litres in a tank to Southland or consider installing some of their equipment at the treatment plant for further testing.

DH advised that he does not see any problem in the confidentiality agreement, this is what we were talking about in Indigitech providing.

AL– so I guess it is the extent that we fund the investigation for using technology that is not demonstrated, we still have no evidence what it can remove. Don't we need evidence as to the performance before we actually investigate whether we would want to incorporate or not.

Process from here:

- Alison to look at Patent
- Sign the confidentiality agreement and see what information we can get from them and then make a decision from there
- Ask about costings, how we could go about putting a plant here for a proposal
- Also get a proposal from them for having something on site

Specifically, what Alison requires is performance criteria and some information as to what the black box is doing outside.

(iv) The Company Water Liberty Markets the product 'Adya Clarity'

This is the black mika, the biotite. This is naturally occurring iron and alum compounds, so it will act as a same coagulant and flocculent. Their claims are more directed to alternative health and waste water treatment.

It was raised that product price tells you the answer, so find out about that.

JB made an enquiry to our people in UK and USA had they seen it used in large scale in wastewater applications, with no response to date. JB will follow up on this.

ACTIONS:

1. Indigitech – Decide when we are prepared to consider the option.
2. Activated Carbon – still on the agenda.
3. Jim advised that we don't have to word the motion, but we come up with a philosophy that we are going to report back about building into the resource consent process and remember the strategy, we have got the strategy and the resource consent process, so TAG is considering a mechanism in terms of the future wastewater strategy and an appropriately worded resource consent condition that periodically reviews future new technologies that may enhance the treated wastewater and we could list some that would be included.

   It was also mentioned that the other part is we delay taking decisions that reduce the flexibility of the solution until we absolutely need to take those decisions. Because when we do make the decisions, we say well, we did delay as long as we could, but we had to make that decision.

   JB – That allows the Indigitech's of the world to see that the door is not totally closed.

   GM advised this is not a Council funded project.

   KM - A comment was made that you have got to have some level of science support to say that you are going to investigate something and Indigitech is just not even there, not anywhere near it.

   As agreed by all, we are going liquid media, we are keeping activated carbon and we have stated the general policy that we would work up as we proceed.

   AL asked how we are going to keep the AC filtration media on the table. Is there any further technical feasibility work to be done. The technical feasibility study on the options has been done and it did not include activated carbon as part of filtration media. It is still on the table. Do we need to put it in to the filtration option as a sub-option.

   JB – I think someone needs to do a little more technical work, not only the nitrogen question, just what it would achieve and how it could be administered.

   GM advised that PDP will build the cost into that other option as part of the cost, in the Business Case.

10. <u>ADVANCE TREATMENT OPTIONS – ULTRAFILTRATION AND REVERSE OSMOSIS (UF/RO)</u>

Technical Note - RPSC – Rotorua Wastewater Treatment Plant Project
Question of Reverse Osmosis Application raised by RPSC

JB circulated and spoke on the above technical note.

Referring to point 3 of this report, costs were made available to the RPSC and also what happens to reject .water. They understand the reject, because in the slides shown the other day, JB had introduced the fact that there is usually ultra-filtration before RO. To advance, JB went to MWH people in Australia to find MWH are doing their own UF/RO plant over in Perth at the moment and even without asking, they gave a really ball court figures based on Australian rates estimated at $90M for the size we want here. However, it could be some benefit having the MBR.

The question was asked if it was desalination. JB confirmed it is treated wastewater ~~It is desalination 2~~ and going into the underground, like Orange County.
JB to check if this is correct.

From here, where do we go as TAG with this option. As above, I have been talking to MWH people in Australia however, we also have one based in Auckland. They said that the concentrate is a real problem, because it is a salt, so you need to take a lot of the salt out. What do you do with the salt it in this environment, you need to discharge it somewhere. You can't put it on the land. They advised that if you want to go further, maybe go to an activated carbon. The question is, what would the RO cost from the committee. We have got this push for the best quality as Geoff Rice says. We also have in front of us a technical group to answer these questions. This cost information has not gone near them at all. So, how far do we go, where do we go, do we come back with something between the options that we have got on the table now in the short list and not going as far as UF to give them an idea and graph it. At the same time, Annaka Davis of Health who is on the committee, gave us a paper that has also been distributed on bug size, virus size, and various technologies that coincidentally Mott MacDonald pulled together. We tried to educate them a bit on where the MBR sits at the moment with its four micron pore size and where an RO of certain pore size sits so I think we have an onus to try and pull something together that is RO and not going as far as RO in the pros and cons as a working paper. We will be shirking our duty if we just stop and say $90M full stop.

DH advised that in site visits and sitting in the (Brisbane) committee, Reverse Osmosis was a big problem. I thought there were chemical issues also, lot of decommissioning and recommissioning. I think we need to be very careful about this.

Going back to the salt issue, if you put it on the land, you would have to dilute it down. JB advised that this was looked at at Ruakaka. We wanted to go to land for the first few years before we let the ocean out? (very hard to hear) so we had to dilute it down to treat wastewater to get to the salt levels. If we discharge the water concentrate, why not leave that salt there, we are discharging to water anyway.

Should we give them a couple of options between, or say $90M, forget it. Do we don't just work up or talk about UF which ties in with Annaka's diagram, because that gets the viruses as well and still got this activated carbon, (the cover thing), the activated carbon will do both micro pollutants and colour.

JB – This comes back to our discussion Greg, do we leave in the add-on basket. We took it out and treated it as a process by itself but again, it could be in that resolution that we work up for a resource consent condition. It could be one of the technologies specifically listed and it is not actually a proprietary technology, there are many proprietary ones for it, general electric does most of them, but it is not like a digitech that's a one-off. We could incorporate back in that future review and just give them a bit more information on this, but there are stages along the way as far as RO like UF as the first part.

KM spoke here, but again, very unclear. Greg's response below.

GM - So what you are saying is don't consider as part of the main plant upgrade now but don't configure the plant, as that's the way that it will preclude any RO coming in later on. Greg agreed with this.

JB – So we can wind that into the earlier statement we made.

You just said RO, but ultra-filtration is another thing.

JB responded that unltra-filtration comes before RO. You come out of the back end of the existing plant, particularly the Bardenpho, you have got the advantage of the MBR, then you get ultra-filtration, and then you do RO, but could you could just stop at ultrafiltration. That gets your smallest viruses caught and you could also put activated carbon in that process somewhere if you are looking at colour and micro-pollutants.

A comment was made about the table attached to the report. Ultra filtration and is a smaller pore size. Isn't necessary better than the micro filtration you have already got. So there is some overlap there.

JB advised that that is the pore sizing of the gear. Microfiltration has the coarser, greater pore size than ultra-filtration. The graph shows that the smaller pore size range of microfiltration overlaps with the larger (coarser) end of the ultrafiltration range.

JB advised that the next stage is we come back to the committee with a bit more information on RO/UF combinations. We float that there is a staged way that that could go or just stop at UF and you could put activated carbon in, depending on where you were wanting to go. Here are some very indicative costs but the way we feel through this is that they are not excluded, they are in the future options periodic consideration basket.

AL – Why would you put them in the future options for consideration and not consider now. Are we making the decision that we are eliminating everything over a certain cost. I understand it will probably be knocked out because of the cost, so should it be in the mix.

KM advised that he could not understand why it is in the mix anyway, because what problems is it solving that we are not solving with the existing proposal in terms of the treatment plant and UV.

JB – It is giving a much higher standard over UV.

KM – My question there is not so much about what is coming out the pipes, its more, what is the impact on the environment. What is coming out of the pipes is not totally relevant. If you have an impact on the environment that is acceptable in terms of bacteria and viruses, why would we want to go to a higher standard.

JB – From an environmental effects point of view we define environment only as a natural environment, you wouldn't. When you have an overall driver that they adopted as a committee on best practicable option under the act, you wouldn't, because that brings in the prong of economics. Where the iwi members are coming from and we have heard it time and time again, the best possible quality restoring the mauri of water as far as we can.

KM advised that he has not heard anything that says this restores the mauri of the water, it is just reverse osmosis or ultrafiltration, is that restoring mauri of water? It is just a mechanical process.

JB – It is getting the best quality, that is where they want to start.

AL – As a TAG, are we saying then that this RO has no advantage in terms of impact on the receiving environment over and above what the options are we already have. Is that why we are going to eliminate it?

GM – As far as the environmental ??? is concerned, there is no advantage to go RO. RO came up because of the Orange County Reclaimed Water Project.

JB advised that they have equated that to the best possible quality.

KM advised that we need to put this into perspective. If you are talking $90M on doing something here, and I'm not sure why we are even looking at reverse osmosis, we are going to spend $45M to get rid of 270 tonnes of nitrogen from the catchment. How does this balance up. It needs to be put into perspective as to what is the value in doing this compared to doing something else around the catchment.

To summarise:

1. We need to go back and ask what is the cost and about the concentrate (this statement can be found in question B. of document.)

2. TAG's recommendation is that we assess the options from an effects-based approach on the receiving waters (includes consideration of cultural, life-supporting capacity, key contaminants, including nutrient, pathogens, micro-contaminants.)
   NB: Considering but not advising on cultural matters

   Therefore, committed an interim answer, they get a bit more about the possibilities and at the end of the day, it can stay in the future review basket under a consent condition.

11. QUESTIONS AND ANSWERS

(Refer to RPSC – Technical Matters Raised at RPSC Committee Meeting, 19 March 2015)

JB gave an update on the background.

JB/GM met with the committee. At this meeting, questions were asked. GM and JB worked on the questions and answers (as attached.)

JB asked the committee to focus on the Group B questions.

JB referred to question 5, the cost of the LTS, which came up today and being asked about the power cost. It is a fair chunk of the $870,000 per year. It is interesting, when you look at the Mott MacDonald report and the increase of operating costs, I think only the highest one, the denite filter, gets to about the same cost as the LTS. I do not know whether the significance of saving $870,000 against what else you are going to do Greg, has come through yet, it is a big chunk of money.

Referring to question 7, JB advised that this question has not risen in many projects that JB has been involved in from Maori about body waste, hospitals and mortuaries.

JB asked for some guidance from the team on the Group B questions, many of which have been answered today.

- Q1, Group B – Peter Staite help folds up from the USA department of household products a whole list of household products and the potential effect on human health. This is after we had presented the water environment federations leading bit of international work on micro pollutants and what treatment plants do to them. JB responded that those compounds should hopefully mirror the compounds in that water environment.

  DH advised that he has some Brisbane documentation that would assist with answering this.

  JB advised that if we can just find the correlation between all these indicator ones and the work that has been done and also DH to also look at the Brisbane document.

  JB advised that we tried to educate the Committee, page 3, of the overheads to the Committee from the WEF~~?~~ Work. They are either absorbed into the solids and then there is a question about TERAX or they are bio-transformed into breaking down compounds. In terms of the land disposal, getting through onto the land, you would expect some to maybe be absorbed on soil column and others would be bio-transformed. All of this lead work showed group the whole range of the compounds as the degree as to which types of treatment removed by absorption or by transformation. Including that was activated carbon for example.

  JB asked if we could can map some of that through WEF and through the Cawthron Report.

- Q2 and Q3 – answered in minutes.

- Q4 – We required some water quality data from the depths of the lake, the upstream and other places. How do we access that?

  AB suggested doing a time base thing table, it would be worthwhile showing what Lake Rotorua looked like over a period of time, over a 20 year period possibly, so that you can actually see what phosphorous has done for example during this period. In that question there is an assumption that Lake Rotorua is in a mess but in actual fact, the water quality is quite good there.

  AL advised that we have data on the upper reaches of the Waipa Stream and also the stream report put together by Paul Scholes.

  AB advised that he would lead this bringing back the steam information data to the 22 April RSPC meeting.

  JB suggested leaving a couple of columns for the treated waste water with whatever process and the effects after discharge.

- **Q.9.** – The option is total use MBR's for the full plant – i.e. converting the Bardenpho plant to MBR for the two thirds of the total as present

  GM advised that this is going to be part of the Mott MacDonald plant review. What is the most efficient way of getting rid of nitrogen and phosphorous from this plant if we are going to start from scratch. This is further on the MacDonald work, the third Business Case.

We will conclude here on these questions. Some of which we can answer at our next meeting.

DH & AC left the meeting at 2.45 p.m.

12. PROGRAMME UPDATE AND MATTERS

(Alternative to the Rotorua Land Treatment System – Agreement on Preferred Option (Proposed Programme (attached))

Update given by GM.

- Cultural Assessment - Antoine will have a draft available by 19 June 2015.
- Effects Study – To be completed by David Hamilton by 29 May 2015.
- Alternative Land Treatment Investigation – the final report will be presented to this group on 19 June 2015
- Treatment "Add-ons" – we have had some inclusions today.
- Site Location of Discharge – we had the first cut today.
- Effects of TERAX – the reports will be available in 6 weeks. Could be available at 22 May meeting.

JB – the ~~Steering~~ Committee have asked for a workshop update on the TERAX and potential discharge to the water locations on 22 April 2015.

GM advised that we will present the locations as they are, including some comments from TAG. The workshop on TERAX will probably be based on what has been discussed today, which is what is happening with TERAX and the recent issues related to them together, as one project. Andy Bell and Peter Dine will handle this.

Greg hopes some of this information will have been developed at this stage where we can come up with a short list, in terms of, how are we going to come out of the forest, by the end of June and then it will go through the Project Steering Committee. This information will then go out for public consultation.

AL – Are we looking at doing an evaluation at the May/June TAG meeting.

This information will be distributed prior to the meeting.

GM to supply a technical report from the committee, similar to the Rotoma/East Rotoiti report. This document to then go out for public consultation and hopefully by September 2015 a decision and a way forward.

13. MEETING REVIEW AND NEXT TAG MEETINGS

22 May meeting – apologies from David.
16 June – a full turnout expected

14. PLANNING AND LEGAL

JB advised the committee that today we have briefly referred to the NPS Freshwater Management 2014 bought into a fresh water policy. JB asked GM if we need to start addressing how well the short-list is coming through in terms of addressing planning instruments.

GM advised to leave Planning holding at this stage.

In terms of Legal, we don't know at this stage if we are going into water or land. JB advised it would only be in terms of someone ticking the alternatives assessment was robust enough to get through the RMA consenting process and the consultation process is robust.

15. BROCHURES/INFORMATION ON RLC WEBSITE

AL advised that there is a web page that we were going to load agendas and main documents, etc. To date, this has not happened.
SP to follow up.

16. DELOITTES REPORT

Greg advised that this is states one report and that a proper evaluation will be done in a final states two report.

AL advised that the reason that it came out cheaper was because it was based on the removal from raw sewerage.

GM said that the agreement will be done by an in-house senior economist. Brief was also agreed on.

17. NEW BUSINESS

KM advised that he had been challenged on the MBR solution for Rotoma, how are we getting the power there. I assumed there must have been some assessment of power supply when the original proposal was put up.

GM advised there was a proposal to extend the power supply coming from the intersection of Manawahe and SH30, which was part of the costing, from the original proposal.

GM further advised there a two proposed sites. We are looking at the capacity of both to be able to handle the load. Part of the process will be to look at when we come into preliminary sites, we need to look at the cost implications of power going into the sites.

Meeting concluded at 3.05 p.m. with a Karakia by Kepa