MINUTES OF ROTORUA PROJECT STEERING COMMITTEE
HELD WEDNESDAY, 20 May 2015 AT 1PM
AT THE ROTORUA LAKES COUNCIL COMMITTEE ROOM 2

PRESENT:	Warren Webber (Chair)	–	Lakes Water Quality Society Inc
	Geoff Rice	–	Tapuika Iwi Authority
	Peter Staite	–	Ngati Te Kahu/Ngati Hurunga Te Rangi
	Andrew Te Amo	–	Ngati Whakaue/CNI
	Geoff Palmer	_	Rotorua Lakes Community Board
	Fred Whata	_	Ngati Pikiao
	Jimi McLean	_	Ngati Makino
	Louise Kirk	_	Ngati Hurunga Te Rangi
	Tamara Mutu	–	Ngati Hurunga Te Rangi
	Marama Meikle	–	Ngati Hurunga Te Rangi
	Rangitihi Pene	_	Tuhourangi Tribal Authority
	Roku Mihinui	_	Te Arawa Lakes Trust
	Leilani Ngawhika	_	Te Arawa Lakes Trust
	Shane Gibbons	_	Tuhourangi Tribal Authority
	Jim Bradley	–	TAG Chairperson
STAFF PRESENT:	Hilda King	_	RLC, Administrator
	Dave Donaldson	–	RLC, Deputy Mayor, Councillor
	Alison Lowe	_	Environmental Scientist, Solid Waste & Sustainability
APOLOGIES:	Alamoti Te Pou	–	CNI Iwi Land Management Ltd
	Annaka Davis	–	Toi Te Ora – Public Health Services
	Neil Oppatt	–	BOPRC, Councillor
	Gina Mohi	–	Ngati Rangiwewehi Iwi Authority
	Antoine Coffin	–	Te Onewa consultants
	Wally Lee	–	Tuhourangi/NgatiWahio
	Greg Manzano	–	RLC, Manager, Water Planning, Water Solutions
	Andy Bell	_	RLC, Director, Water Solutions

1. MIHI/KARAKIA

   Opening Karakia by Fred Whata

2. WELCOME AND APOLOGISES
   Apologies noted above

Resolved

Warren Webber Geoff Rice	))	***That the apologies be received.***

CARRIED

3. REVIEW AND APPROVAL OF PREVIOUS MINUTES FROM 22 APRIL 2015

Jim – Slide 7 Page 17 of minutes. The size of WWTP MBR (4 micron pore size) is not correct. This will be amended in todays meeting. It should be 0.4micron.

Resolved

Warren Webber	)	***That the minutes from 22 April 2015 have been received and accepted.***
	)	
		CARRIED

4. ACTIONS FROM PREVIOUS MINUTES/MATTERS ARISING

Agenda Item No	Action	Assignee
7	Collation of information to date – indexed/referenced/summarised	Warren

Action to be brought up in general business.

5. NOTIFICATION OF GENERAL BUSINESS ITEMS

None

6. UPDATES

a. Cultural assessment strategy and process

CAS met on 12/05/15.

This is still a work in progress. Discharge to land options were being considered.

Peter Staite – Through this cultural assessment I'm finding that the Maori cultural perspective of things is miles away from the science of things/western methodology.

A major concern is the budget available to remedy the current situation.

b. TAG update (Jim Bradley/Alison Lowe)

Jim talked to the following Power Point presentation.

GROUP B: QUESTIONS & ANSWERS

Further information to that presented to RPSC on 22 April 205

Question 1 Effects of Wastewater Treatment of Health compounds in sewage

- Question related to US Department of Health Household Products List
- Professor David Hamilton has information from the Brisbane Reclaimed Water project he was involved in. Will present to RPSC in June
- Will "try to match" some typical compounds listed to the work on micro-pollutants and removal in WWTP's of the Rotorua type

Question 2 Reverse Osmosis (RO) Indicative Costs

- Refer RO information previously presented including the very indicative $A90M capital cost for Rotorua size
- Last RPSC agreed to further look at Activated Carbon and Ultrafiltration (UF)
- UF is the step before Reverse Osmosis (RO) to produce reclaimed/drinking water quality
- UF membranes next slides and membrane particle size
- Additional work on Reverse Osmosis?

GROUP B: QUESTIONS & ANSWERS

Further information to RPSC on 22 April 205

Option 2C Ultrafiltration (UF) Membranes

- The Mott MacDonald December 2014 Report included it as Option 2C of Filtration Options
- Option 2C which include the Option1 Base Option has an indicative Capital Cost of $22.3M and annual operating addition of $0.47M
- Of this the actual UF capital cost is $7.9M and additional annual operating is $180,000pa
- Membrane nominal pore size 0.02 microns
- Refer to slide for removals

Question 3 Reverse Osmosis (RO) Systems – What happens to the Waste Concentrate Scheme?

- Typically 15-25% of the incoming treated wastewater flow to the RO plant
- This waste stream is salty and can be difficult to handle/dispose of
- At coastal locations and desalination plants usually returned to the sea
- Inland plants discharge to freshwater, to land, bore injected into land, or evaporated to leave a salt
- Would be a significant issue in the Rotorua inland situation and taking into account the driver(s) for RO

Ultrafiltration (UF) equipment and Pore Sizes and Correction of earlier incorrect figure showing existing MRB at 4 Micron Pore Size

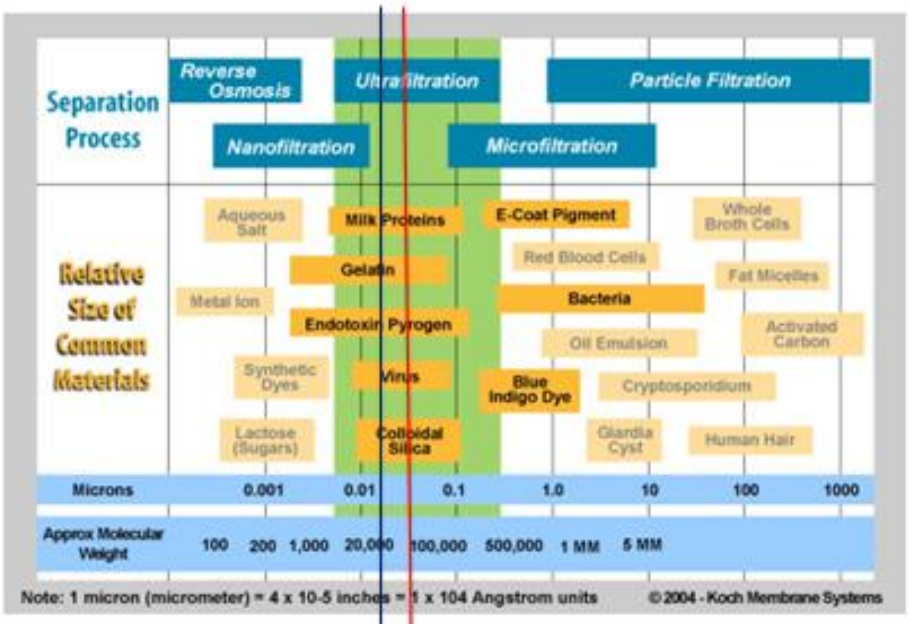


Figure 1.0 Relative Particle Sizes (Koch, 2004)

Existing MBR 0.04 Micron Pore Size (Zeeweed 500D module)

Option 2C Mott MacDonald Dec Report – Membrane Ultrafiltration (UF) Z-PAK UF System – 0.02 Micron Pore Size

Jim referred to the above slide highlighting the correct pore size of the existing MBR (Zeeweed 500D) unit is 0.04 micron (not 4mm as previously plotted on the issued slide of Figure 1.0), and the membrane used in Option 2C Filtration is 0.02 micron pore size.

Alison talked about what Reverse Osmosis does. In general what it does is cleans 2/3 of the water and leaves 1/3 of the water really salty. So we then have the problem of what to do with all that salty water. The further you go to the left (of diagram) you're starting that new problem of what to do with all that salt.

Warren- Is Nano filtration applied to waste water treatment plants internationally?
Jim – Sorry cant answer that for you but I could check it out for you.

Peter – Are you telling us that you'd be leaving all those salts and Metal ion and dyes in the water?
Alison – Yes. Think about the water that you already drink. It's already full of salt. If you start filtering it out, you'd actually worsen your water.

Peter – Would you put them in the harmful contaminate category? This is what the cultural assessment is all about.
Alison – No.

The Option 2C – Ultrafiltration (UF) Option

GE Power & Water
Water & Process Technologies

Z-PAK Pressurized UF Systems

ZeeWeed* 1500 Ultrafiltration for 400 to 4000 gpm (6 MGD)

Benefits

- The ZeeWeed 1500 membrane has a 0.02 µm nominal pore diameter - for optimal removal of particulates, bacteria and viruses. Its PVDF chemistry gives mechanical strength and chemical resistance.

Typical Permeate Quality

Recovery Range (single stage)	90-95%
Bacteria, *Giardia*, *Cryptosporidium*	≥4-log removal
Iron	≤0.05mg/L*
Manganese	≤0.02 mg/L*
TSS	≤0.1 mg/L
TOC	50-90% removal[0]
Arsenic	<5µg/L*
Color	<5PCU[0]

* Pretreatment required
[0] dependent on water quality

7

This model is the one Mott MacDonald based their estimate on.

Rotorua WWTP – MBR (Membrane Bioreactor) Plant which takes one third of the daily flow

GE Power & Water
Water & Process Technologies

ZeeWeed* 500D Module

Immersed Hollow-Fiber Ultrafiltration Technology

Membrane Properties	
Material	PVDF
Nominal Pore Size	0.04 micron
Surface Properties	Non-Ionic & Hydrophilic
Fiber Diameter	1.9 mm OD / 0.8 mm ID
Flow Path	Outside-In

8

This is the plant we currently have in place.

GROUP B: QUESTIONS & ANSWERS cont...

Question 4 Water quality of unpolluted springs and lake water for comparison with treated wastewater and treated wastewater once discharged

- Regional Council has good information on key parameters that are being used in the Effects Assessment
- This information will be included as part of the Effects Assessment so that comparisons with previous and current water quality and ecology can be made to the discharge assessment
- Will include as far as possible the key parameters that CAS has identified eg colour

Question 5 Further information on Black Mica as an "Add-On"

- Refer RPSC 19th March 2015 information Slide 2 and "Add-On's" update RPSC 22nd April 2015
- No new full scale "case history" had been obtained to date – still awaited

Question 6 Status of Various "Add-On's"

- Updated RPSC 22nd April 2015
- No new updates. Activated Carbon being covered elsewhere

GROUP B: QUESTIONS & ANSWERS cont...

Question 7 Information on TERAX

- RPSC Workshop 22nd April 2015
- Draft Report from Mott MacDonald received and being reviewed RCC and TAG

Question 8 Information on Treated Wastewater Discharge Options and Other Locations

- RPSC Workshop 22nd April 2015 – initial information
- Initial feedback from CAS and RPSC Committee sought
- Effects Study looking at a range of Lake Rotorua shoreline (as per initial information) and lake bed discharge locations and Puarenga Stream locations

Question 9 Option to Totally Use MBR for the Full Plant (100% MBR's)

- Included in the Mott MacDonald WWTP Strategy Study
- Draft Report just received being reviewed by RL and TAG from Mott MacDonald

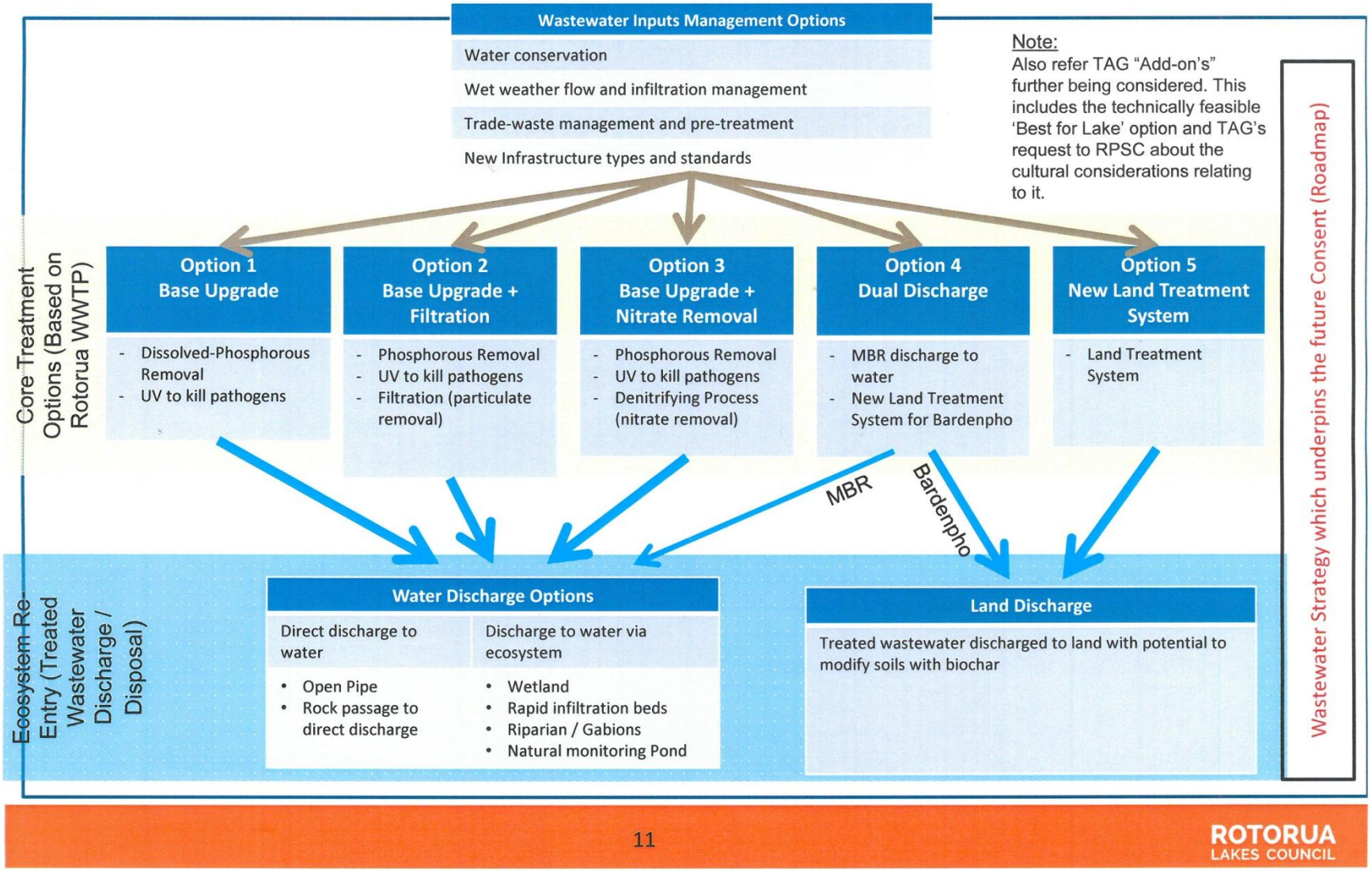
Please note that an updated Glossary of Terms has been prepared (Issue No.3 30th March 2015) and is attached to RPSC Minutes 19th March 2015

Cr Donaldson: Regarding the sensitive issues around discharge points ie: Ngapuna, I believe it would be useful if the committee had its own recce and understood the proposals on where to discharge, not only the CAS committee, but the RPSC at some point. It would do us all a lot of good to get a better understanding and have a look at where they are.

Warren – Good suggestion. We will look at setting up a programme of site visits when we've received reports.

Jim Bradley: So how does all this fit together??

TAG Core Short List Options - Adopted By RPSC



ROTORUA LAKES COUNCIL

Workshop with RPSC:

Detailed Feasibility Study

Alternatives to Land Treatment for the Rotorua WWTP

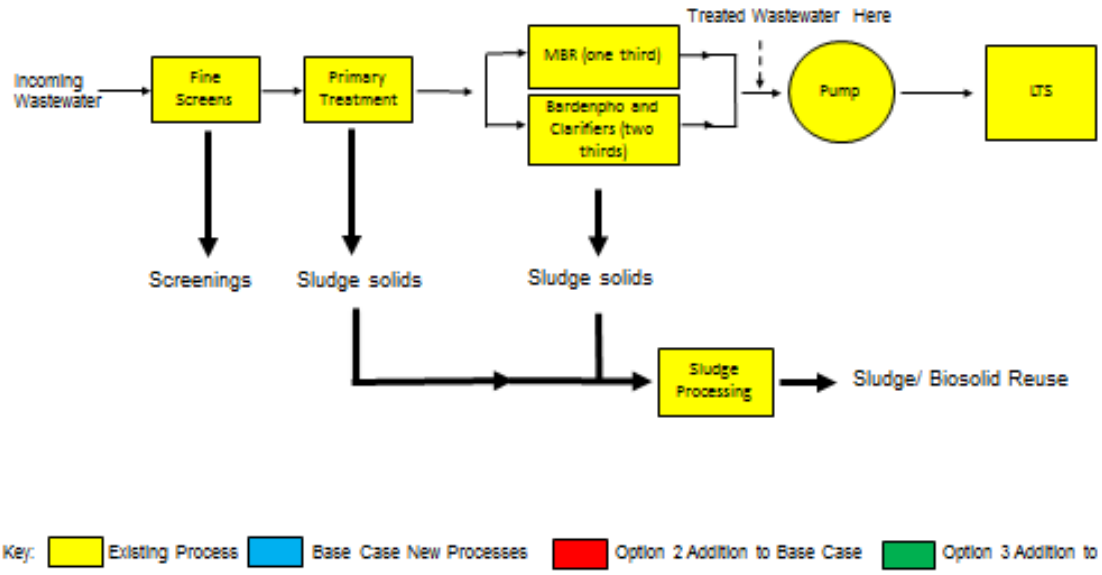
Mott MacDonald Report December 2014

Presented to RPSC December Meeting

How do the shortlisted options fit together?

Starting Point

The Existing Wastewater Treatment Plant (WWTP) and Land Treatment System (LTS) Simplified



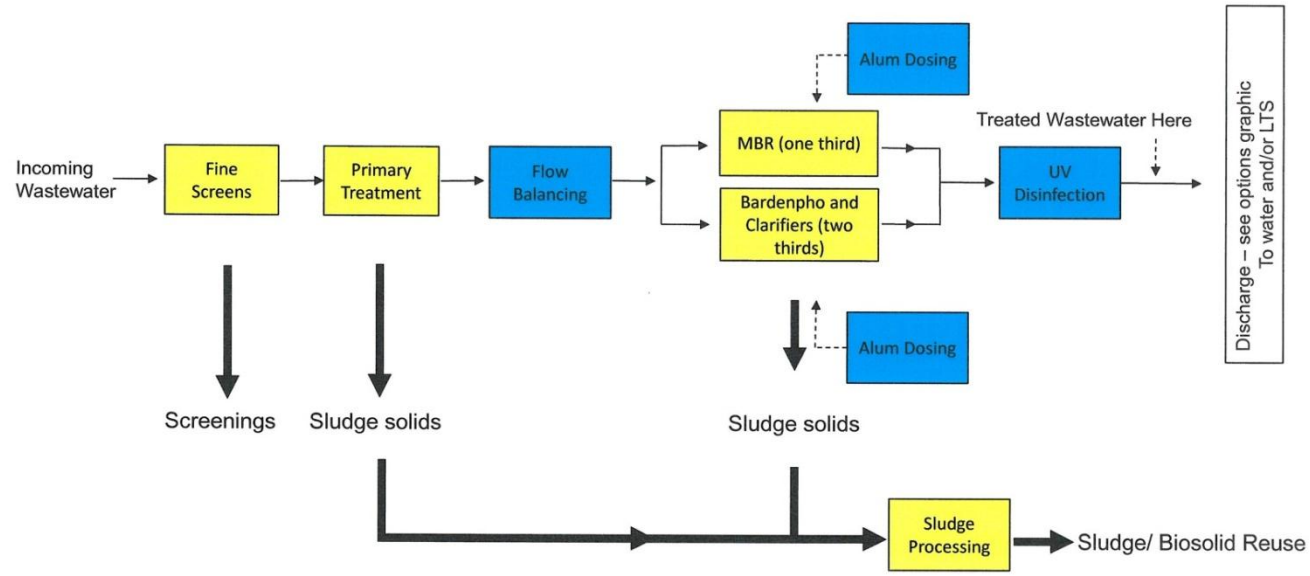
Treatment Options 1, 2 and 3

Option	Treatment Plant		Wastewater Ecosystem Disposal/Discharge Option
	Upgrade	Description	
1	Base Option	▪ Flow balancing ▪ Phosphorus removal (chemical addition of Alum) ▪ UV disinfection	❖ Pipe to direct discharge (with & without diffuser) ❖ Rock Passage to direct discharge ❖ Wetland ❖ Rapid Filtration Beds ❖ Gabion/Riparian ❖ Natural monitoring pond
2	Base Option + Filtration	▪ 2A Disc filters ▪ 2B Sand filters ▪ 2C Membrane filters	
3	Base Option + Denitrifying Filtration/Carbon Bed	▪ 3A Denitrifying sand filters ▪ 3B Carbon beds	

Option 1 - The Base Case

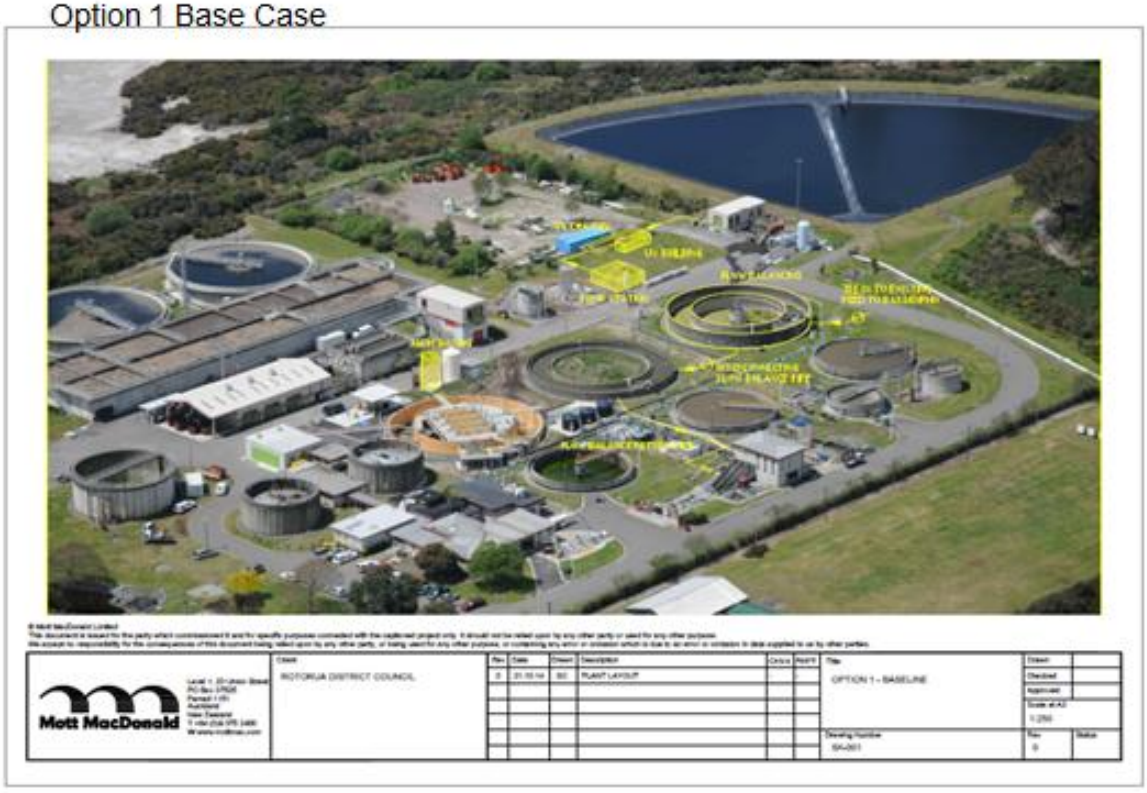
Add in

- Flow Balancing
- Alum dosing for phosphorus removal
- UV disinfection to kill pathogens (germs)
- New discharge to water and/or LTS (refer separate graphic)



Key: Existing Process | Base Case New Processes | Option 2 Addition to Base Case | Option 3 Addition to Base Case

Option 1 Base Case



Options 2A, 2B & 2C - The Base Case and Filtration

Add in to the Base Case – Filtration – three alternatives

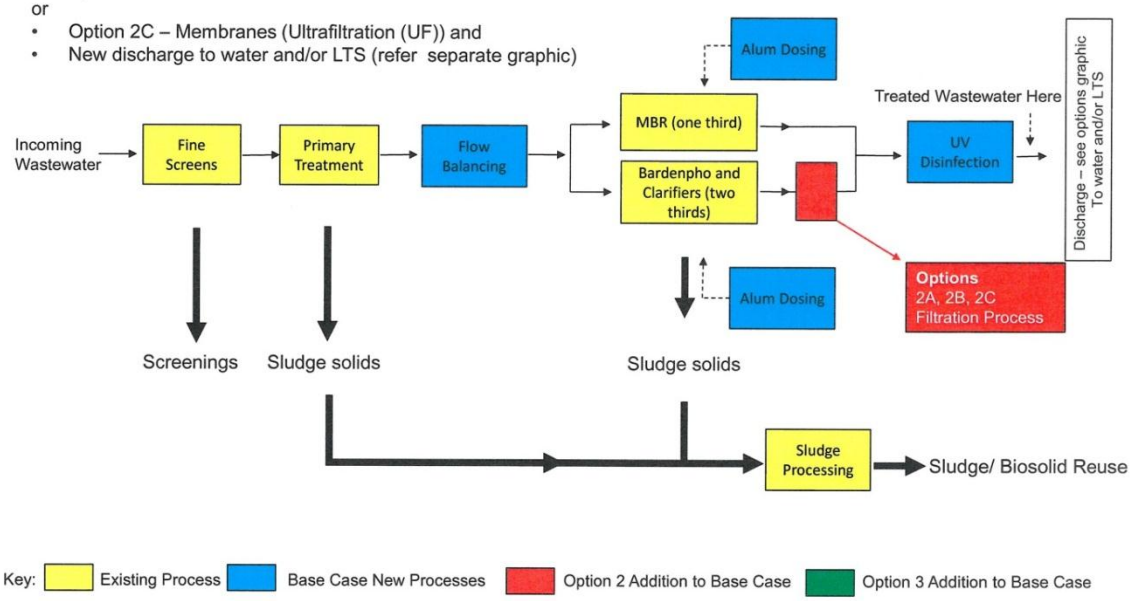
- Option 2A – Disc Filters

or

- Option 2B – Sand Filters

or

- Option 2C – Membranes (Ultrafiltration (UF)) and
- New discharge to water and/or LTS (refer separate graphic)



Key: Existing Process | Base Case New Processes | Option 2 Addition to Base Case | Option 3 Addition to Base Case

Option 2C – Base Case Plus Membrane Filters

Mott MacDonald

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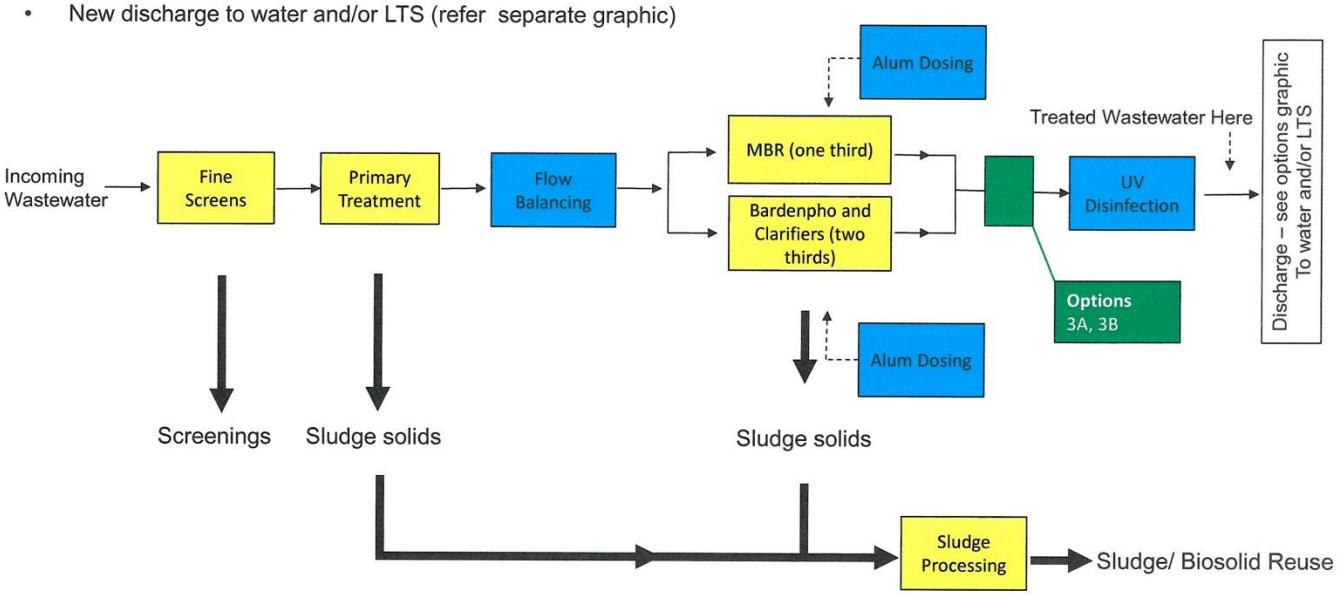
OPTION 1c – BASELINE AND MEMBRANE FILTER

Options 3A & 3B - The Base Case and Denitrifying Filtration / Carbon Beds

Add to the Base Case
- Option 3A – Denitrifying Filters

or
- Option 3B - Carbon Beds and
- New discharge to water and/or LTS (refer separate graphic)



Key: Existing Process | Base Case New Processes | Option 2 Addition to Base Case | Option 3 Addition to Base Case

Option 3A – Base Case Plus Denitrifying Sand Filter

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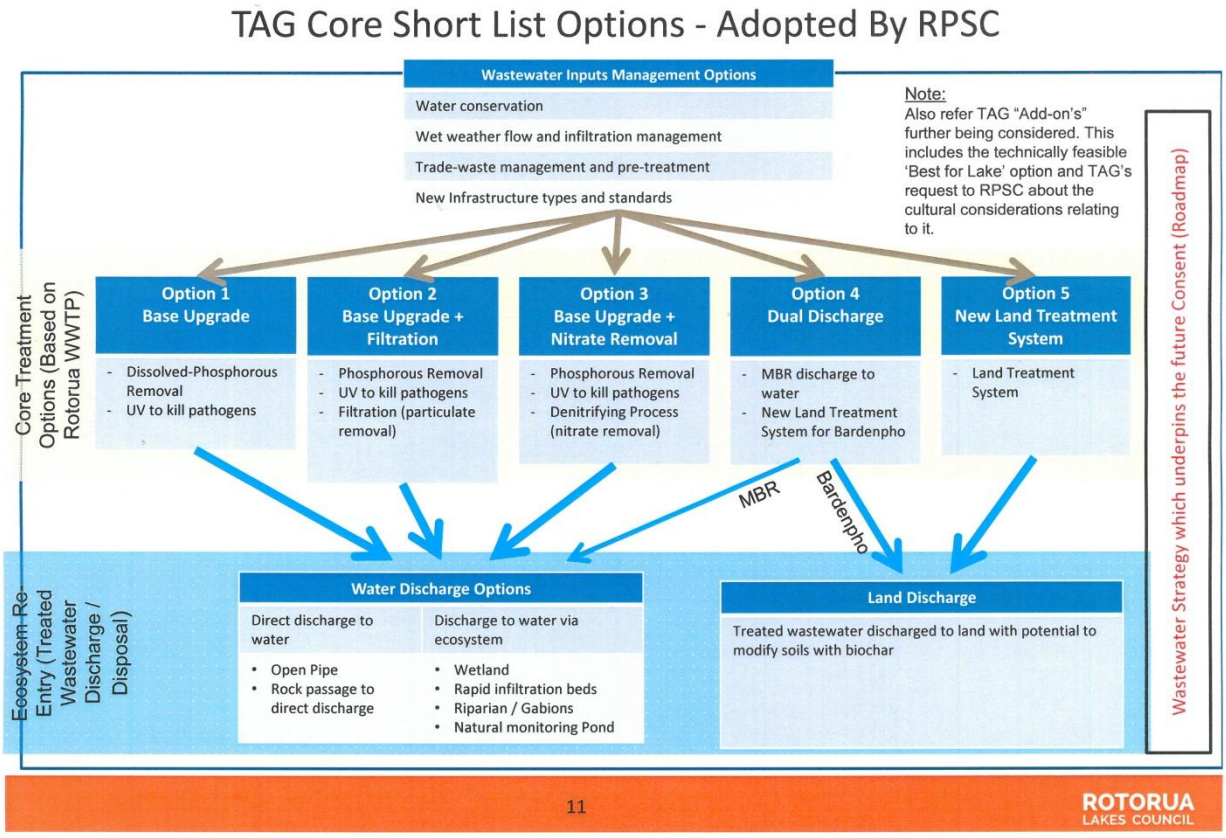
OPTION 3a - BASELINE AND DENITRIFYING SAND FILTERS

Cr Donaldson – At the last meeting I asked a question around the flow rate, out the exhaust pipe (discharge point). Andy stated that what we saw at the forest was about the average, but that there were peaks; high's and low's. Would the flow balancing make that flow rate at the discharge point more consistent?

Jim – Totally. Not only that but if the flow balancing is before the biological treatment units then that enhances those treatment processes as well.

Alison continued to talk about Wastewater Inputs and Management options. Looked at the possibility of having a condition in consents that covers things like the water conservation strategy, tradewaste bylaws etc, and we need to look at ongoing monitoring.



Peter – We want to create cleaner water than what it is discharging at the moment to a better standard. Can we start building something now? Something that would be in place by 2019.

Alison – talked about the complexities of the add ons and the sludge processing.
Because we're spending so much money on getting this water as clean as we can, should we actually step back and say whats the best we can possibly do, rather than having an add on and add on approach?.

Peter – Is reverse osmosis a solution?
Alison – If we could come up with a solution on how we could deal with 8000 cubic meters a day of salty water, plus the fact that its going to cost over $90mil, but the biggest problem would be dealing with 8000 cubic meters of salty water a day. Basically you're separating the water, 2/3 becomes clean and the rest is extremely salty. Its too salty to even put back to earth as it will kill a lot of the micro-organisms in the soil.

Jim – Studies done in Australia have looked at things like evaporation. In most places it just goes back to the sea.
The plant we're looking at in Marsden point refinery using the RO system, the salt will go back out through a main discharge to the sea.
In Australia they've looked at bore injecting it, but you cant inject something that has a much worst quality than the bore.

Jim – Regarding UV, the less solids you have the more efficient UV is in 2 ways. You can either have a unit with less power hence less electricity costs,, or get higher microrganism kill.

Peter – Is there such a thing as a rotating uv light?
Jim – I don't think so, but I'm not absolutely sure.

Further discussion took place around UV and other options.

Cr Donaldson – Alison you talked about consent conditions and inputs. Regarding Wastewater Inputs Management Options, are you talking about consent conditions for the plant or consent for major inputs,ie; Red Stag?

Alison – The thought is that we could deal with some through a discharge consent, and the discharge consent requires us to consider what's coming in (in terms of sewage). The consent is quite rigorous, it means we cant accept just anything into the plant, you've got to think about what it is you accept at the plant, or how you deal with the inflow and infiltration coming in, and what will we accept in terms of trade waste or extra volumes and how often will we stop to review what we're doing and are there any foreseeable issues.
So it's a consent for our whole upgrade and the whole process, that looks at the front end of the treatment plant. This is a fairly new concept.

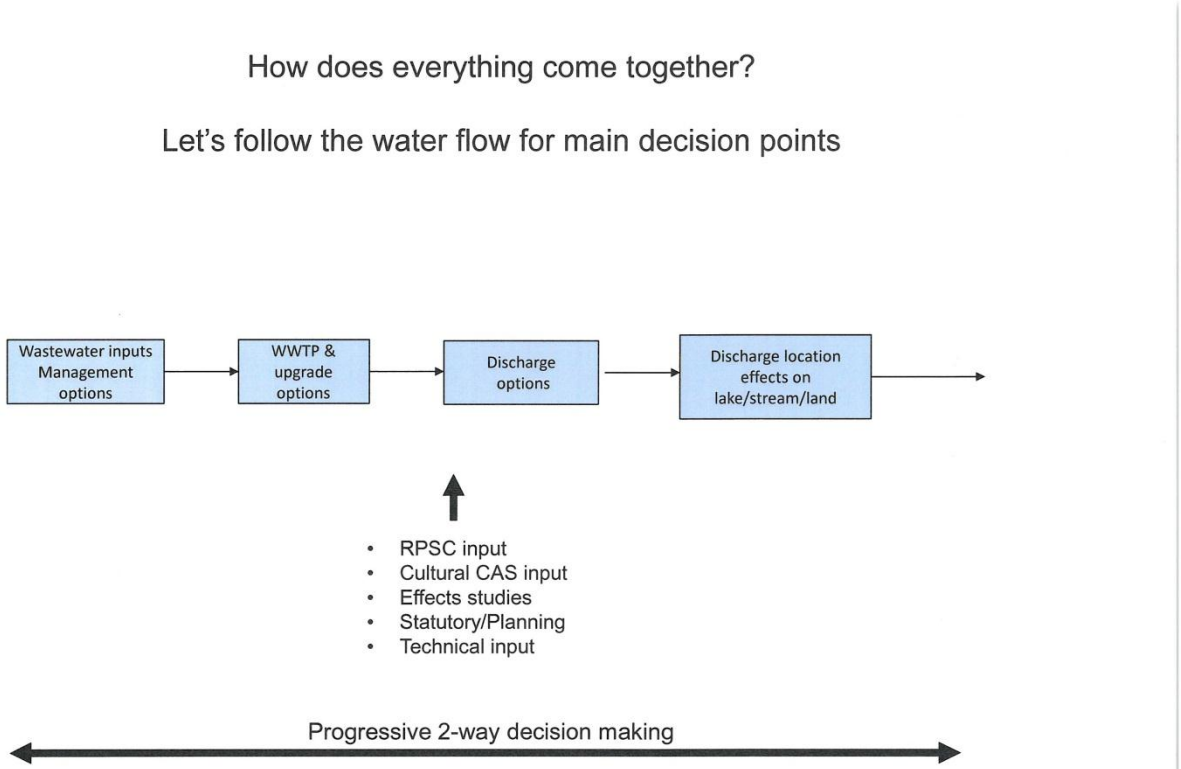
Peter – Do you have more information about the very fine bad viruses that could remain in the water after all treatment is done.

Alison – Annaka Davis from Toi Te ora Public Health Services would be the best person to talk on this subject.

Warren – Its my understanding that the UV will deal to them, particularly if we've got an MBR plant which has taken the majority out.
It may be useful to show which viruses fit in which size range, and pick out a few of the nasty's so we can get a clearer picture of whats going on.

Jim – What we have to do is a microbiological risk assessment for discharge in accordance with Ministry of Health and MFE's guidelines. So on all consent applications we do a public health risk assessment. It's a complex bit of work and one of the key viruses we target in this is the Norovirus.

Tamara – Requested a copy of the slide with the key decision dates and the slide with the summary. (Copy of slides to follow) Also included in today's as presentation as Attachment 1.

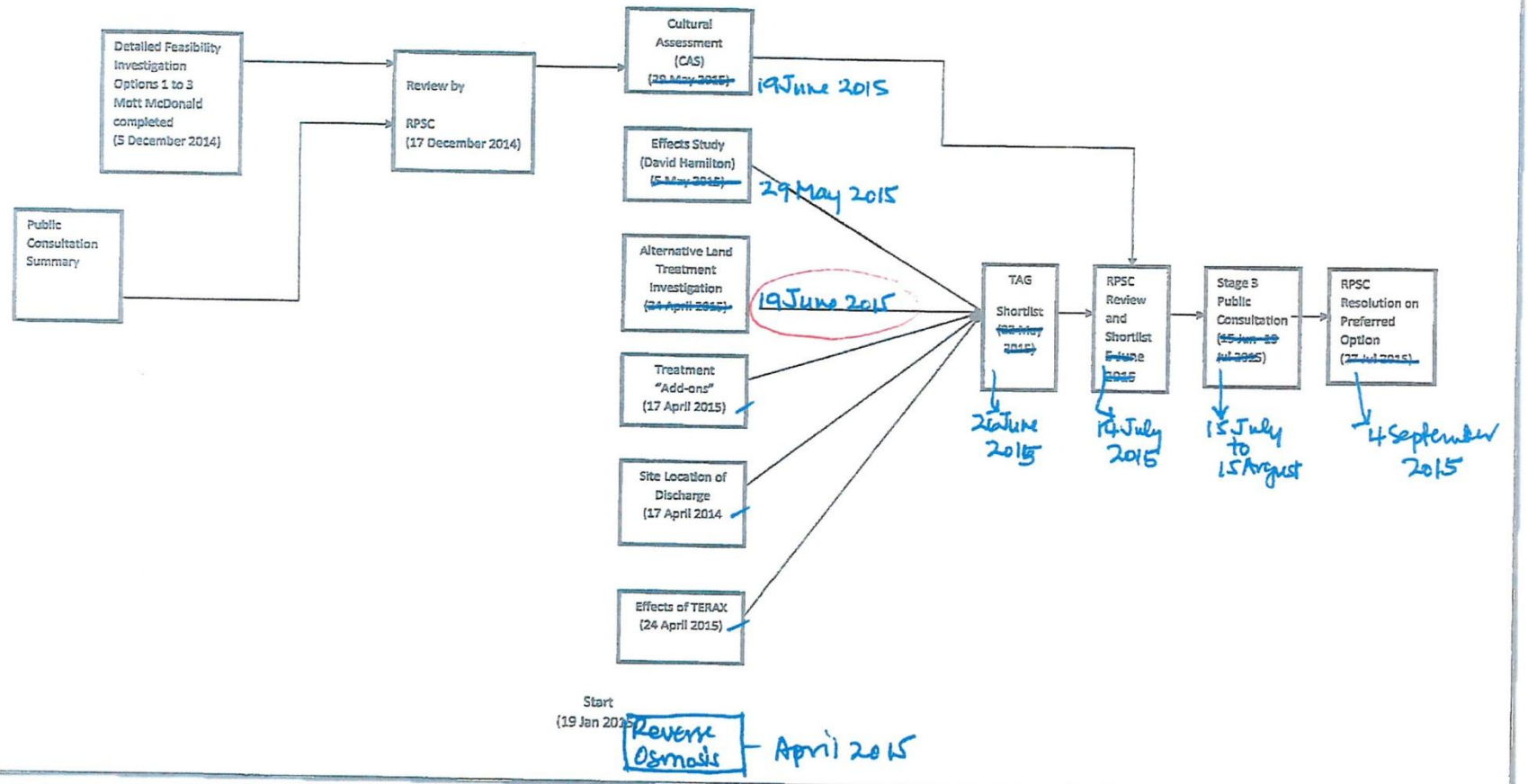


Discussion took place around the timelines.

RDC-515361

ALTERNATIVE TO THE ROTORUA LAND TREATMENT SYSTEM

AGREEMENT ON PREFERRED OPTION (PROPOSED PROGRAMME)



c. Technical Feasibility Study (Greg Manzano/Andy Bell – Jim to talk on their behalf today)

RLC Technical and Environmental Investigation Tasks Update to RPSC 20th May 2015

1. TERAX and Wastewater Treatment Project Interaction
- RPSC Workshop held
- Assessment nearing completion. Draft Mott MacDonald Report received by RLC

2. WWTP Treated Wastewater Direct Discharge Options
- RPSC Workshop held
- CAS & RPSC initial input sought
- To be integrated to output of Effects Study (Item 5 below) Output - 29th May 2015 (see below)

3. Alternative Land Treatment Investigation
- Mott MacDonald working with RLC. Draft Report received
- Final Report due 19th June 2015 for RPSC 23rd June 2015

4. WWTP Strategy Study
- Task being undertaken by Mott MacDonald - Consultants
- Focussed on "Best Overall Approach" to WWTP upgrading
- Includes TAG/Mott MacDonald short-listed Treatment Options 1, 2 & 3 and decommissioning primary treatment to obtain carbon source, full conversion to MBR Plant, options with and without TERAX
- Draft Report received. Interaction includes Item 1 - TERAX

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RLC Technical and Environmental Investigation Tasks Update cont...

5. Environmental Effects Study of Treated Wastewater Discharge
- This major task well in progress - 26 1D models and 11 3D models
- Being undertaken by University of Waikato led by Professor David Hamilton
- Interacting with TAG activities and RLC direct discharge location task
- Draft Report due 29th May 2015

6. Reverse Osmosis etc Treatment Considerations
- General information presented RPSC 19th March 2015 and 20th May 2015
- Further direction sought from RPSC how much further to take Reverse Osmosis
- Ultrafiltration is Option 2C in Mott MacDonald Dec 2014 Report (covered later today)
- Activated Carbon process currently being investigated

7. Treatment Add-on's Update
- RLC/TAG update to RPSC 22nd April 2015
- No updates

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7. GENERAL BUSINESS

Collation of information – Jim suggested to set up a page on the Te Arawa Lakes Website similar to the TAG page currently in place.
Action: Hilda to inquiry and set up

Peter – At a previous CAS meeting there was mention of a process called gasification?
Warren – That's new information to me.
Jim – In waste technology its producing gas from waste, a type of biogas.
Warren – Suggest we ask Antoine to give us more information about this.
ie: who and what the process is?.
Action: Warren to follow this up with Antoine.

8. NEXT MEETING

Warren – So Jim to confirm you've rescheduled your next TAG (Technical Advisory Group) meeting.
Jim – Date will be confirmed when I've caught up with Greg Manzano. 16th June is the proposed next TAG meeting.

Warren - Next meeting we plan to hold a work shop. There are 3 aspects we need to workshop.
We need to start at 9am with the workshop then follow up with our meeting.

If the CAS could also have considered the Alternative Land Treatment Sites report before we workshop here. Please consider meeting before next workshop.

Time wise there is pressure coming on, but these are things that need to be considered.

We need to have a report first, CAS have to meet, TAG have to meet and we all have to meet on 24th June.
Information won't be available until the end of this month.

We'll keep you up to date with communications as much as we can.

Proposed date is Wednesday 24th June.
After further discussion it was decided to change the date of workshop and meeting to Thursday 25th June.

Action: Hilda to book committee room.
Action: Jim to follow up David Hamilton's availability. Jim also to keep everyone up to date with report progress.

9. KARAKIA WHAKAMUTUNGA

Meeting closed at 2.45pm with closing Karakia by Fred

Actions:

Agenda Item No	Action	Assignee
6b	Is Nano filtration applied to waste water treatment plants internationally? (Warren asked)	Jim Bradley
7	Inquire and set up page on Te Arawa Lakes Website for this Committee. A place to store information.	Hilda King
7	Ask Antoine for more information about gasification, as per Peters query.	Warren Webber

Attachments to Minutes of
Rotorua Land Treatment System Project Steering Committee Meeting
Wednesday 20 May 2015

Attachment 1

Slides RPSC 20th May 2015.pdf