

## ALTERNATIVE TO THE ROTORUA LAND TREATMENT SYSTEM

### SUMMARY OF OPTIONS AND TERAX

1. TERAX was initially developed based on the WWTP effluent being discharged into the Whakarewarewa Land Treatment system.
2. Rotorua Lakes Council (RLC) and the owner of the existing Land Treatment System (LTS) – Central North Island Iwi (CNI), agreed to cease the operation of the LTS by the end of 2019.
3. Options for the proposed upgrade of the Rotorua Wastewater Treatment Plant were developed with the assumption that the carbon rich liquid produced by TERAX would be returned to the Wastewater Treatment Plant.
4. Following is a summary of options identified as alternative to the existing land treatment system.

Option No.	Option Description	Comments
1	Base Option Flow balancing + P removal + UV Sludge disposal through TERAX.	Does not comply with current consent limit of 30T N and 3T P.
2a	Base Option + Disc Filtration Sludge disposal through TERAX.	Does not comply with current consent limit of 30T N and 3T P
2b	Base Option + Sand Filtration (RGF) Sludge disposal through TERAX.	Does not comply with current consent limit of 30T N. Complies with 3T P requirement.
2C	Base Option + In-line Membrane Filtration Sludge disposal through TERAX.	Does not comply with 30T N consent limit. Complies with 3T P limit.
3a	Base Option + Denitrifying Sand Filtration Sludge disposal through TERAX.	Complies with 30T N and 3T P limits.
3b	Base Option + Carbon Beds Sludge disposal through TERAX.	Carbon bed performance unknown at low effluent nitrogen levels.
4	Current plant with MBR (1/3 flow) flow discharge to water and Bardenpho (2/3 flow) flow discharge to land at 5mm/day or 20mm/day loading rates. Sludge disposal through TERAX.	Complies with 30T N and 3T P limits
5.	Current plant with all flows discharged to land at 5mm/day or 20mm/day loading rates. Sludge disposal through TERAX.	Complies with 30T N and 3T P limits.
6.	Full MBR Option. - Bypass primary with MBR after the Bardenpho. - Sludge dewatering + offsite disposal.	Complies with 30T N and 3T P limits.

5. RLC and TERAX Project Team identified several risks related to the inclusion of TERAX (the return of the TERAX liquor) to the WWTP upgrade. These are:
  - Colour to the effluent.
  - Recalcitrant nitrogen to the plant and effluent.

- Calcification in the TERAX plant.
6. Mitigation of the above risks were identified and included in the costing of the options.
  7. Options 4 and 5 were parked by RPSC in their meeting on 25 June 2015. This was based on concerns with availability of land and the relatively high cost.
  8. Options 3a and 6 are the only options that complies with the current resource consent limits of 30T N and 3T P. RPSC in their meeting on 25 June 2015 considered these as the preferred options.
  9. With Option 3a, sludge is processed through TERAX. The liquid by-product is returned to the plant as a source of carbon.
  10. With Option 6, sludge is dewatered and disposed offsite. This option is totally decoupled with TERAX (no return of TERAX liquor to WWTP.)
  11. RLC decision on whether TERAX is to proceed as an integral part of the WWTP, will influence the choice of preferred upgrade option.
  12. RPSC could proceed with public consultation based on preferred options 3a and 6 with their discharge options.

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Greg Manzano  
Manager, Water Planning

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Jim Bradley  
Chairperson  
Technical Advisory Group

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