

**RRSSC TAG Action Item 3.1: OPTIONS HIGH LEVEL RISK ASSESSMENT**

ISSUE: DRAFT  
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No	Source / well being	Hazard Threat Risk	Option 1: Piped to Rotorua			Option 2: Single treatment plant and land treatment system			Option 3: Two treatment plants and land treatment systems			Option 4: Urine separation, septic tanks, 9 cluster schemes			Option 5: Small Biolytix clusters			Option 6: Small Biolytix clusters with urine separation			Option 7: OSET compliant on-site treatment systems		
			Likelihood	Con-sequence	Risk	Likelihood	Con-sequence	Risk	Likelihood	Con-sequence	Risk	Likelihood	Con-sequence	Risk	Likelihood	Con-sequence	Risk	Likelihood	Con-sequence	Risk	Likelihood	Con-sequence	Risk
<b>Env Lakes Natural Environment</b>																							
1		Lakes Quality: Expected Improvement not achieved	Rare	Minor	Low	Rare	Minor	Low	Rare	Minor	Low	Possible	Severe	High	Almost Certain	Severe	High	Possible	Severe	High	Almost Certain	Severe	High
2		Lakes Quality: P to lakes more complicated than expected/ not achieved	Rare	Minor	Low	Rare	Minor	Low	Rare	Minor	Low	Possible	Severe	High	Almost Certain	Severe	High	Possible	Severe	High	Almost Certain	Severe	High
3		Unexpected other contaminant issues, e.g. micro-organisms	Rare	Minor	Low	Rare	Minor	Low	Rare	Minor	Low	Possible	Severe	High	Almost Certain	Severe	High	Possible	Severe	High	Almost Certain	Severe	High
4		Soils become saturated and P breakthrough	Rare	Minor	Low	Rare	Minor	Low	Rare	Minor	Low	Possible	Severe	High	Almost Certain	Severe	High	Possible	Severe	High	Almost Certain	Severe	High
5		More nitrogen being flushed out to lakes than expected	Rare	Minor	Low	Rare	Minor	Low	Rare	Minor	Low	Possible	Severe	High	Possible	Severe	High	Possible	Severe	High	Possible	Severe	High
<b>Ec Economic - Capital, Operating, Community</b>																							
1		Capital cost: Unexpectedly higher than estimates/reviews	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Unlikely	Severe	Medium
2		Operating cost: Unexpectedly significantly higher than estimates/reviews e.g. power cost increase; chemical usage; transport cost of urine to farms increase	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Possible	Severe	High	Possible	Severe	High	Possible	Severe	High	Possible	Severe	High
3		Subsidies: DoH acceptance/approval not obtained - Rotoma	Rare	Catastrophic	High	Rare	Catastrophic	High	Rare	Catastrophic	High	Almost Certain	Catastrophic	Extreme	Almost Certain	Catastrophic	Extreme	Almost Certain	Catastrophic	Extreme	Almost Certain	Catastrophic	Extreme
4		Other Subsidies (than DoH) not available - Rotoma	Rare	Catastrophic	High	Rare	Catastrophic	High	Rare	Catastrophic	High	Almost Certain	Catastrophic	Extreme	Almost Certain	Catastrophic	Extreme	Almost Certain	Catastrophic	Extreme	Almost Certain	Catastrophic	Extreme
5		Other Subsidies (than DoH) not available - Rotoiti	Rare	Catastrophic	High	Rare	Catastrophic	High	Rare	Catastrophic	High	Almost Certain	Catastrophic	Extreme	Almost Certain	Catastrophic	Extreme	Almost Certain	Catastrophic	Extreme	Almost Certain	Catastrophic	Extreme
<b>T Technical</b>																							
1		Nutrients: Predicted treatment/reduction not achieved	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Possible	Severe	High	Possible	Severe	High	Possible	Severe	High	Possible	Severe	High
2		Unexpected climate change impacts - peaked and prolonged wet weather and dry periods	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium
3		Equipment and System not as proven and reliable as thought	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Possible	Severe	High	Possible	Severe	High	Possible	Severe	High	Possible	Severe	High
4		Future flexibility for capacity changes and changed consent conditions	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Possible	Major	Extreme	Possible	Major	Extreme	Possible	Major	Extreme	Possible	Major	Extreme
5		Unexpected Geotechnical risks (instability, water tables, fault lines)	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Minor	Low	Rare	Minor	Low	Rare	Minor	Low	Rare	Minor	Low
6		Unexpected construction delays and impacts	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Unlikely	Severe	Medium
<b>O Operating and Maintenance</b>																							
1		Odour nuisance: Unexpectedly more difficult to mitigate	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium
2		Technical and Operational: Operational Resiliency - unexpected critical failure to key elements of solution e.g. power failure at pump stations, urine storage significantly longer/higher volumes, Economic cost of urine as fertilizer not competitive, etc	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Possible	Major	Extreme	Possible	Severe	High	Possible	Major	Extreme	Rare	Insignificant	Low
3		Natural hazard risks, e.g. earthquakes, floods, landslips, etc.	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium
4		Prolonged power outages	Rare	Major	High	Rare	Major	High	Rare	Major	High	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium
5		Blockage in pipelines	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low	Rare	Minor	Low	Rare	Minor	Low	Rare	Minor	Low	Rare	Minor	Low
6		Infrastructure corrosion potential greater than anticipated	Unlikely	Minor	Low	Unlikely	Minor	Low	Unlikely	Minor	Low	Rare	Minor	Low	Rare	Minor	Low	Rare	Minor	Low	Rare	Minor	Low
<b>PC Planning, Consenting, Approvals</b>																							
1		Land for treatment and disposal: Unexpectedly more difficult to find, purchase, and secure long term lease	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium
2		RDC acceptance/approval not obtained	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium
3		Resource consents: Unexpectedly more difficult to obtain	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium
4		Transfer mains alignment: Unexpectedly more difficult to get approval	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium
5		Unexpected amenity effects experienced																					
<b>PH/S/ CE Public Health/Social/Community Environment</b>																							
1		User perception and acceptance of urine separating toilets and urine storage	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Possible	Severe	High	Not Applicable	Not Applicable	Not Applicable	Possible	Severe	High	Not Applicable	Not Applicable	Not Applicable
2		Resistance to treatment and disposal facilities in individual properties	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Possible	Severe	High	Possible	Severe	High	Possible	Severe	High	Rare	Minor	Low
3		Public Health: Unexpectedly risks/ high impact e.g. micro-organisms not treated effectively	Rare	Severe	Medium	Rare	Severe	Medium	Rare	Severe	Medium	Possible	Major	Extreme	Possible	Major	Extreme	Possible	Major	Extreme	Possible	Major	Extreme
4		Unexpected Odours from facilities on individual properties	Rare	Insignificant	Low	Rare	Insignificant	Low	Rare	Insignificant	Low	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Rare	Insignificant	Low
5		Unexpected Noise from facilities on individual properties	Rare	Insignificant	Low	Rare	Insignificant	Low	Rare	Insignificant	Low	Rare	Insignificant	Low	Rare	Insignificant	Low	Rare	Insignificant	Low	Rare	Insignificant	Low
<b>C Maori Cultural - Kapa to advise please</b>																							
<b>O Other</b>																							
1		Change in political environment e.g. OSET/other?	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Unlikely	Severe	Medium	Possible	Major	Extreme

**Notes:**  
1 High Level - Specific mitigation measures other than in concept work not yet considered will be developed for Preferred Option(s) approach  
2 Follows AS/NZS 4360 Standard on Risk Management

Likelihood	Con-sequence
Rare	Insignificant
Unlikely	Minor
Possible	Severe
Moderate	Major
Almost Certain	Catastrophic
Not Applicable	Not Applicable

Likelihood	Consequences				
	1	2	3	4	5
Rare	L	L	M	H	H
Unlikely	L	L	M	H	E
Possible	L	M	H	E	E
Moderate	M	M	H	E	E
Almost Certain	M	H	H	E	E

**Key:**  
Consequence - 1: Insignificant, 2: Minor, 3: Severe, 4: Major, 5: Catastrophic  
Risk - L: Low, M: Medium, H: High, E: Extreme