

Risk Owner	Date Current Inherent Risk	Inherent Risk	Residual Risk	Risk ID#	Area	Theme	Risk/Issue	Impact:	Treatment 1	Treatment 1 Owner	Treatment 1 Progress / Effectiveness	Treatment 2	Treatment 2 Owner	Treatment 2 Progress / Effectiveness	Treatment 3	Treatment 3 Owner	Treatment 3 Progress / Effectiveness	Treatment 4	Treatment 4 Owner
CEO/GM IAM	18-Feb-20	41	25	DC01	Kaikohe	Insufficient Water	Low Flows in the Wairoro Stream	Will lead to insufficient water being available to supply Kaikohe	Level 4 Water Restrictions, increased comms and awareness of the water crisis. Signage, public meetings, private leak fix campaign.		Treatment Implemented. 30% reduction in water use observed.	A temporary supply from Lake Omapere with an overland pipe from the lake to the catchment above the Taraire Hills dam. Progress: Landowner Agreement 50% complete. Detailed design 80% complete. Pipe installed. Headworks not yet started.			A temporary supply from the lower Wairoro Stream between Northland College and Cumber Rd with an overland pipe from the temporary take point to the permanent Wairoro intake point. Progress: Landowner agreement 90% complete. Detailed design 90% complete. Pipe ordered. Pricing underway.				
CEO/GM IAM	18-Feb-20	41	#N/A	DC02	Kaikohe	Drinking Water Standards	The proposed alternative supply is prone to cyanobacteria outbreaks	The algae can block the membranes at the WTP making production less efficient. Once the algae dies a toxin is released that cannot be treated with existing equipment.	Additional monitoring and plant shut down to avoid toxins entering the supply.		Results of testing can take up to three days: overnight delivery of sample, 24 hour turnaround of algae sample.	Additional filters and dosing proposal to be prepared by BECA.		Filters can remove algae and protect the membranes but they cannot remove toxins.	Dilute Lake Omapere water with Lower Wairoro Options		Only diluting the risk, not eliminating.		

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CEO/GM IAM	18-Feb-20	37	#N/A	DC14	Kaitaia	Insufficient Source	Low flows in the Awanui River and Okahu Stream	Will lead to insufficient water being available to supply Kaitaia	Apply for Water Shortage Direction from NRC and implement Level 4 Water Restrictions. Increase comms and awareness of the water crisis. Signage, letter drop and social media. The Awanui is unlikely to completely dry up downstream of our take.		Treatment Implemented and WSD issued by NRC.	Further reduce demand on the WTP and the river by closing the bulk tanker fill point (relocating to Sweetwater).			Supplement the take of the Awanui River with tanks from the Sweetwater bore.			If the Awanui is no longer able to provide any water to Kaitaia secure an alternative supply including temporary infrastructure to get the water in sufficient quantity to the Kaitaia Water Treatment Plant.	
CEO/GM IAM	18-Feb-20	37	#N/A	DC27	Rawene	Insufficient Source	Low Flows in the Petaka Stream	Will lead to insufficient water being available to supply Rawene.	Apply for Water Shortage Direction from NRC and implement Level 4 Water Restrictions. Increase comms and awareness of the water crisis. Signage, letter drop and social media.		Implemented. 20% reduction in demand vs benchmark	Modification of raw water infrastructure. Bring online the raw water storage (part of the new, uncommissioned, Omanaia WTP) as a buffer tank. With a buffer tank we can take from the Petaka at a lower flow rate over 24hours.		Progress: Concept with FNW to detail and price.	Secure an alternative supply for Rawene including temporary infrastructure to get the water in sufficient quantity to the Water Treatment Plant.				

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CEO/GM IAM	18-Feb-20	35	#N/A	DC11	District Wide	Insufficient Source	Minimal rain and water conservation leads to low flows in the reticulated sewer	Low flows increase the likelihood of blockages, spills and odour issues. High strength wastewater will increase the load on the wastewater treatment plants and may lead to breaches in consented limits for parameters such as bacteria or nutrients	Increased wastewater network maintenance. Jetting mains, cleaning pump stations and clearing blockages.		Increased network maintenance will reduce the likelihood of spills and blockages but will not support WWTP compliance.								
CEO/GM IAM	18-Feb-20	35	13	DC13	Kaitaia	Insufficient Source	Water level (stage) in the Awanui River is too low and air is drawn into the WTP	WTP slows significantly due to entrained air or the WTP is shut down because the floc blanket is disrupted.	Raise the water level of the Awanui River at the water intake point by creating a weir/dam downstream of the intake structure.		Water level has been temporarily raised to a safe level.								
CEO/GM IAM	18-Feb-20	33	#N/A	DC16	Kaitaia	Insufficient Source	The Kaitaia WWTP is the most vulnerable to shut down in low flow conditions.	The discharge from the WWTP will cause damage to the ecology downstream.	Stop discharge by blocking the outlet of the WWTP ponds and allowing the water level in the ponds to rise. There will be damage to the bunds and wavebands in the ponds. There is 30-40 days storage in			Once the ponds are full an alternative site will need to be found. Possible land discharge nearby.							

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									the ponds with increased water levels.										
CEO/GM IAM	18-Feb-20	31	#N/A	DC05	District Wide	Environmental (human) Impact	Prolonged dry weather has a very high number of rural water users without water. There are insufficient local resourced to provide water in a timely manner and the cost of water is unaffordable to some.	Health and safety of rural water users is compromised	Ensure rural community facilities such as marae and community halls have water and act as local water collection points.		Residents can go to these local places and collect water from their tank supplies. Because we don't know the condition of the tanks we are putting the water into, or the cleanliness of the containers being used, it is recommended that all water users boil the water prior to consumption.	Re-open reticulated facilities in town for water collection and hygiene.		Residents may need to travel further but water quality is less risky.					

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CEO/GM IAM	18-Feb-20	29	#N/A	DC08	District Wide	Failing Infrastructure	Extremely dry ground conditions is increasing the failure rate of our trunk water mains.	When a large diameter (100mm+) water pipe breaks it can quickly empty the treated water storage/reservoirs. With rivers so low it will be more difficult to replenish the reservoirs while supplying the town.	WTP operators closely monitor live real-time demand from the supply. A sudden increase in demand is a sign of a leak and the retic team is dispatched to look for the leak.		Implemented. A leak in Kaikohe was found and isolated within 20 min.								
CEO/GM IAM	18-Feb-20	29	#N/A	DC12	District Wide	Insufficient Source	Many of our wastewater treatment plants require sufficient dilution for the environmental impact to be less than minor	Rivers with very low flow may not be able to accept our WWTP discharge	Blocking the outlet and maximising storage. This can damage wavebands on the ponds			Finding a temporary alternative discharge location such as bunding an paddock.							
CEO/GM IAM	18-Feb-20	27	#N/A	DC10	District Wide		Intense media attention and scarcity of raw water in the environment	Increase in risk of sabotage or vandalism of our infrastructure or water supply	Escalation of criminal activities to emergency partners if required.			Monitoring of anti social behaviour on social media and within communities.							
CEO/GM IAM	18-Feb-20	27	#N/A	DC19	Kerikeri	Failing Infrastructure	The KIC supply line will continue to fail as it has a number of times already this	Once the line breaks air enters the line and it can take days or weeks to remove the air and return to full flows.	Support KIC with people and materials to fix any breaks in the line supplying FNDC.			Switch main supply to the Puketotara River							

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							summer due to dry soil conditions.												
CEO/GM IAM	18-Feb-20	23	#N/A	DC09	District Wide	Failing Infrastructure	Extremely dry ground conditions is increasing the failure rate of our lateral water mains.	Increase in leaks across the network	We reply on staff and members of the public seeing these leaks once they show above ground and calling in an RFS.										
CEO/GM IAM	18-Feb-20	23	#N/A	DC17	Kerikeri	Insufficient Source	Kerikeri Irrigation Dam (lake waingaro) is falling at the expect rate for this time of year and climatic conditions.	The water quality of water at the lower levels of the lake are poor and less suitable for a WTP.	Continue to supplement the KIC supply with the Puketotara stream			Implement Level 4 water restrictions							
CEO/GM IAM	18-Feb-20	23	#N/A	DC22	Kawakawa	Insufficient Source	Water in the bores new Tirohanga stream are insufficient to meet the demand of Kawakawa and Moerewa water users.	The WTP is unable to meet the demand of the water users and reservoirs are unable to fill.	Apply for Water Shortage Direction from NRC and implement Level 4 Water Restrictions. Increase comms and awareness of the water crisis. Signage, letter drop and social media.			Redirect bulk tankers to new bulk tanker fill point in Kaitaia.			Secure an alternative supply for Kawakawa/Moerewa including temporary infrastructure to get the water in sufficient quantity to the Water Treatment Plant.				

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CEO/GM IAM	18-Feb-20	21	#N/A	DC03	Kaikohe	Environmental (human) Impact	High demand on the bore at Monument Hill will accelerate local springs drying up including Waikotihe Spring	The Waikotihe Spring serves a number of houses, a large marae and a significant church	Maximise production from Taraire WTP to supply Kaikohe including filling the Monument reservoirs using Orrs road pump station.										
CEO/GM IAM	18-Feb-20	19	#N/A	DC06	District Wide		The wide spread nature of the drought event is putting pressure on human resources within Far North Waters.	Operations team is stretched fine tuning plants and operating infrastructure is on the limits of its abilities. RFS loads are very high as the dry ground cracks and customers are reporting leaks.	Projects team is focused on implementing contingency plans and supporting operations.										
CEO/GM IAM	18-Feb-20	17	#N/A	DC21	Kawakawa	Insufficient Source	Water levels in the infiltration gallery are too low to take water	This causes entraining air in the pipeline and WTP.	Lower pumps in the bore										
CEO/GM IAM	18-Feb-20	17	#N/A	DC25	Paihia	Insufficient Source	Water level (stage) in the Waitangi river is too low and air is drawn into the WTP.	WTP slows significantly due to entrained air or the WTP is shut down because the floc blanket is disrupted.	Raise the water level of the Waitangi River at the water intake point by creating a weir/dam downstream of the intake structure (above Haruru Falls).										

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CEO/GM IAM	18-Feb-20	15	#N/A	DC23	Kawakawa	Failing Infrastructure	Galleys between clarifier and the filter are known to be substandard but work has been delayed to improve them until the drought is over.	There is an increased risk of WTP failure with the critical piece of infrastructure in such poor condition.	Install temporary scaffolding to support the infrastructure.										
CEO/GM IAM	18-Feb-20	15	#N/A	DC26	Paihia	Failing Infrastructure	High demand from the tourism town forces the WTP to run close to 24/7.	The WTP is unable to meet the demand of the water users and reservoirs are unable to fill.	Implement Level 4 Water Restrictions			Redirect bulk tankers to new bulk tanker fill point in Kaitaia.							
CEO/GM IAM	18-Feb-20	13	#N/A	DC07	District Wide	Failing Infrastructure	The widespread nature of the drought event is putting pressure on the supply of critical spares	Assets Impacted - Pumps, level probes, PCL, VSD, and non-standard pipe and fittings	Review on inventory on hand and recommendations from FNW on purchases required			Understand what is available from our colleagues at Watercare and Whangarei District Council							
CEO/GM IAM	18-Feb-20	13	#N/A	DC18	Kerikeri	Insufficient Source	The Puketotara stream is reaching consent limits for low flow.	FNDC unable to take water when consent limits reached	A Water Shortage Direction will be applied for at the appropriate time to allow FNDC to continue to take water when consent										

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									limits have been reached.										
CEO/GM IAM	18-Feb-20	11	#N/A	DC24	Paihia	Insufficient Source	Low flows and high temperatures increase algae growth in the river.	Algae growth on the intake screen reduces the rate of take and subsequent treatment capacity.	Increase manual cleaning of the intake screen.										
CEO/GM IAM	18-Feb-20	7	#N/A	DC20	Kerikeri	Failing Infrastructure	The main KIC line down from the dam face is specialist large diameter pipe. As at 14/2/20 it was understood that there was one length of spare pipe for repairs. There are no stocks of this pipe in New Zealand and it needs to be specially made.		Work with KIC using broadspectrum's commercial weight to make things happen.										
CEO/GM IAM	18-Feb-20	5	#N/A	DC04	Kaikohe	Failing Infrastructure	The Orrs Road pump station fails	Demand on the bore at monument hill increases	Ensure we have a critical spare for the Orrs Road pump station pump on hand.										