

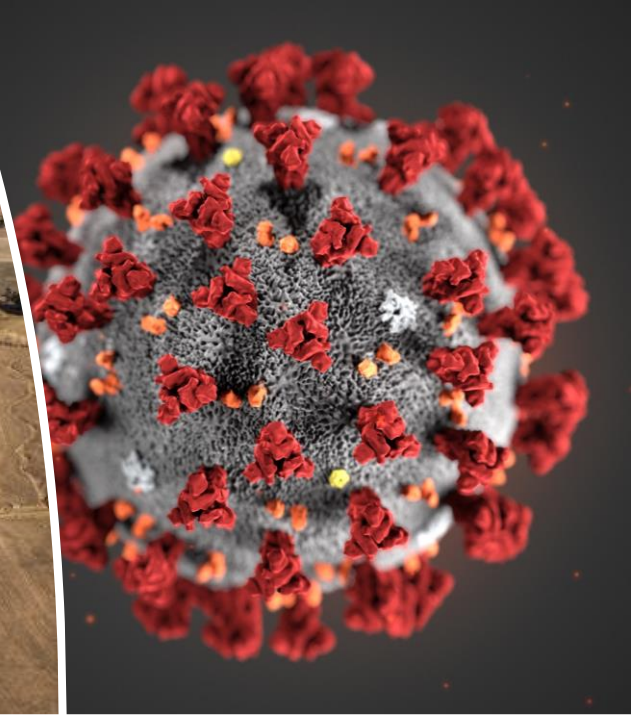
# National Lifeline Utilities Forum

## Droughts, Floods, Pandemic and Cockroaches

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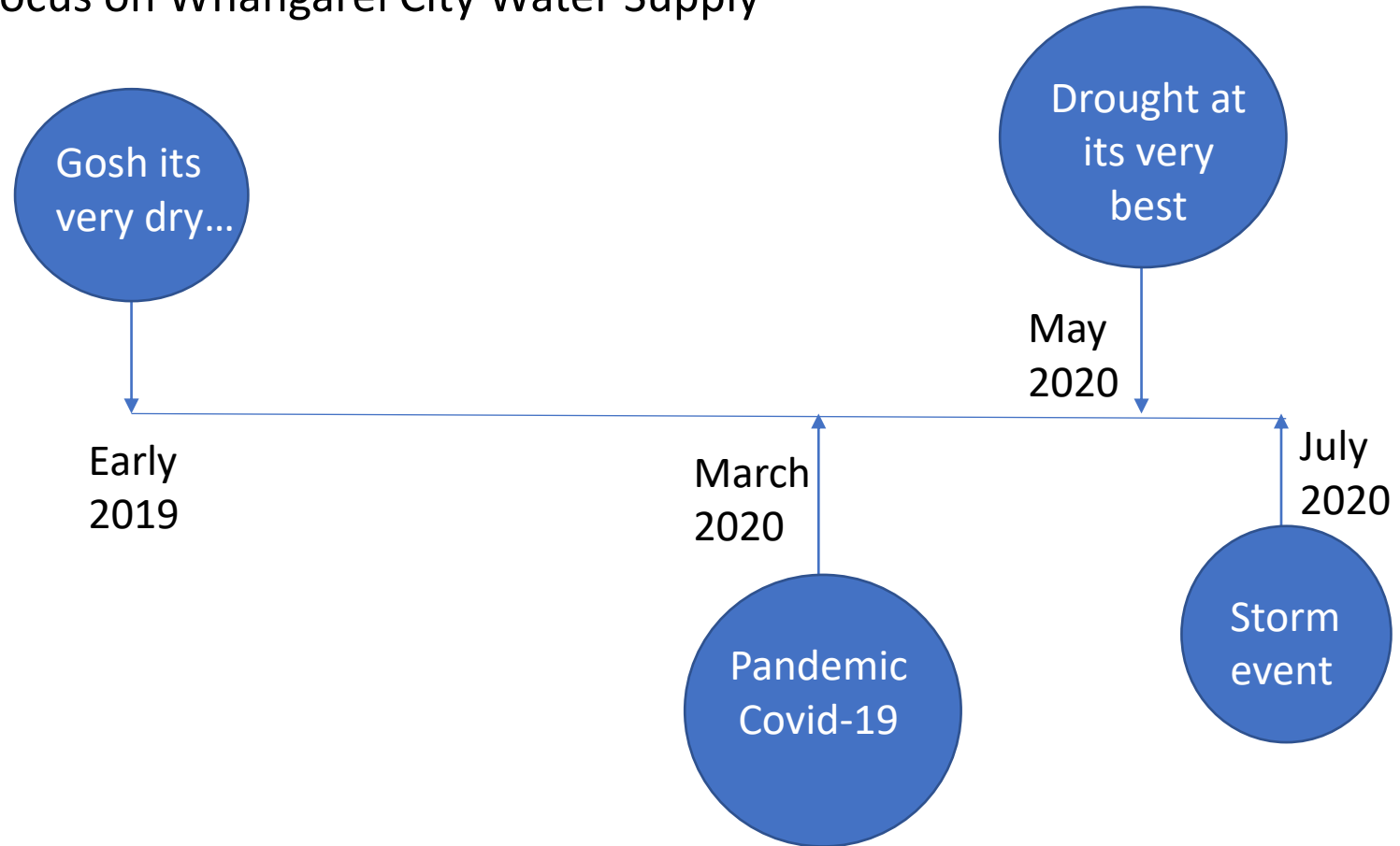
***Simon Weston – General  
Manager Infrastructure***

***Wednesday, 21<sup>st</sup> October 2020***

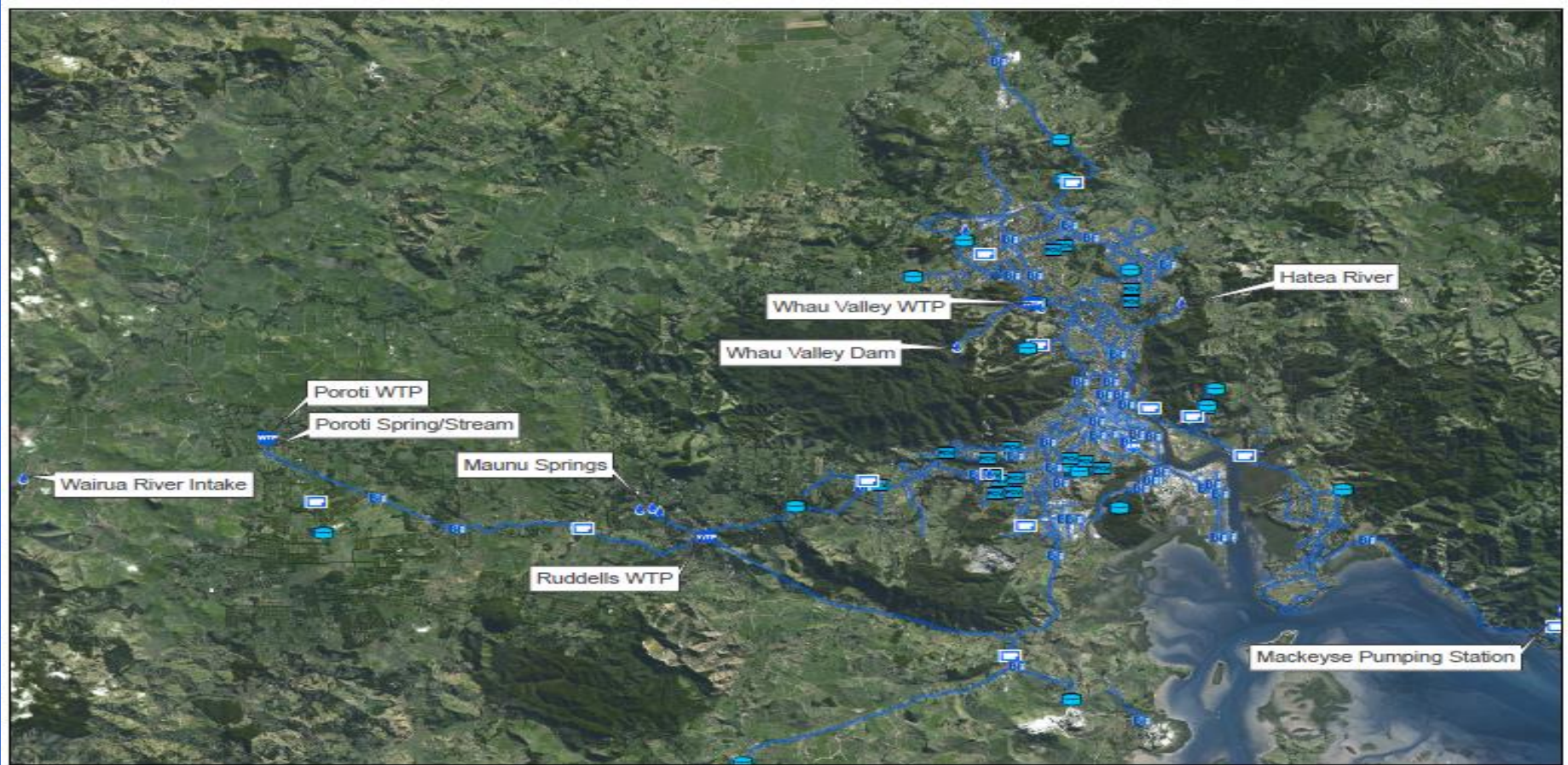


# The 2019 – 2020, Challenging timeline of events...

- Focus on Whangarei City Water Supply







# What a year... 2020 Water Supply for Whangarei City

Supplied by Whau Valley Dam; Maunu Springs; Poroti Springs; Hatea River

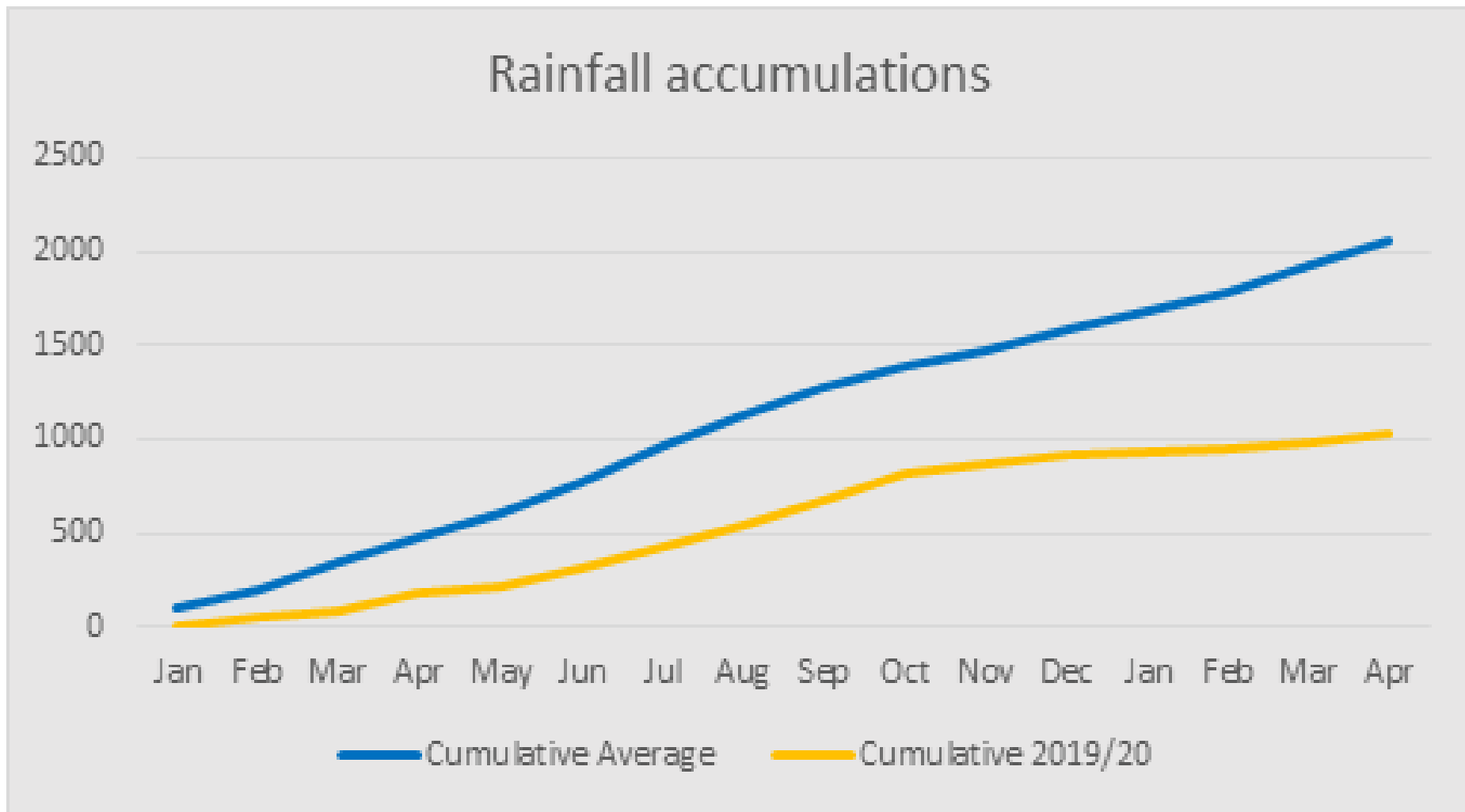


# The Drought... Just how bad can it be?

- Worst drought since Water Services Records began in 1971
- 2019 annual rainfall lowest on record at only 916mm - 58% of normal rainfall
- 2020 similar to 2019, by 1 May only 123mm of rain had fallen for the year – 28% of normal rainfall
- January 2019 to March 2020 the rainfall deficit was just over 1000mm

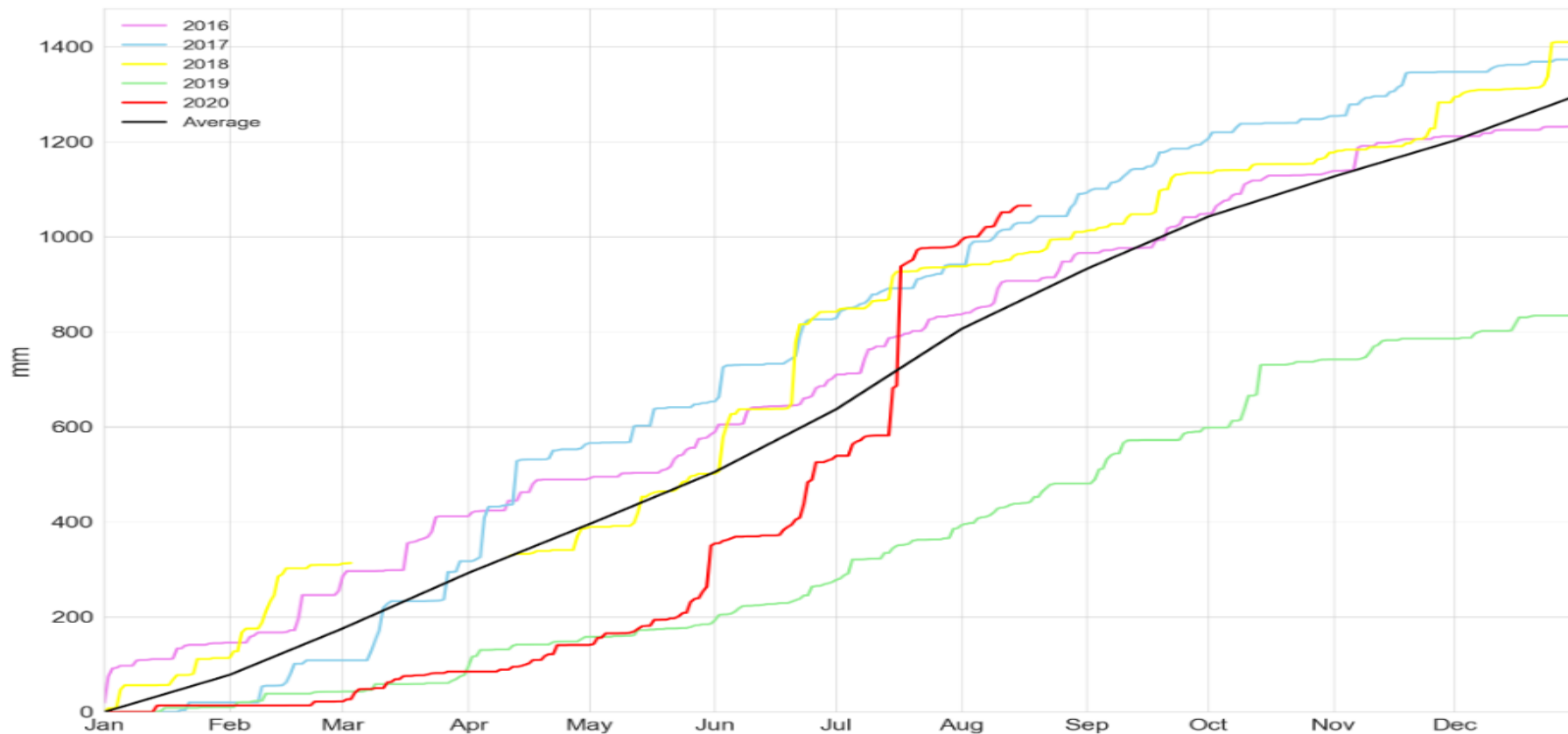
# Gosh it's dry, 16 months

## Cumulative Rainfall Deficit



# Rainfall Accumulation for Whangarei

Rainfall accumulation plot for Whangarei







# Drought, *Pre-emptive Strike*

- Early 2019, dusted off the Drought Management Plan.
- Very conservative... Introduced dam conservation measures as early as February 2019.
- Used river sources. During 2019 we pumped 1,900,000m<sup>3</sup> more water from Poroti Springs and Hatea River sources than we would normally.
- Resulted in Whau Valley Dam at the start of 2020 being 90% full (normal being 92%).



# Drought... *Data and Campaigns*

- January 2020 staff Drought Committee convened

The committee analyses demand and source data to recommend actions that Council should take, and the messages for consumers.

- Public campaign started early 2020 – ‘Be Water Wise’ and ‘Fill the Dam’
- February 2020 was the driest on record, Drought Committee recommended that formal water restrictions be imposed. Council delegation for the Chief Executive for powers to impose the restrictions.





# Drought — *Water Shortage Direction*

- Hatea River down to continuation flow January/February 2020
- 28<sup>th</sup> February the Northland Regional Council issued a Water Shortage Direction for the Hatea River. This direction has allowed us to take water down to a lower flow in the Hatea River.
- This helped to slow the rate of decline of the Whau Valley Dam
- The long-range forecast at the time still showed little significant rain.



# Drought... *Water Source Challenges*

## Hatea River

- Due to the condition of the 300mm diameter PVC Hatea River raw water pipeline we could only pump 50% of the consented (9,000m<sup>3</sup>/day) take.
- Funding was brought forward to urgently upgrade this pipeline and in February a contract was awarded.

## Poroti WTP and the Wairua River

- Council obtained (in 2011) consent for abstracting 21,000m<sup>3</sup>/day from the Wairoa River, near the Poroti Water Treatment Plant. Pipeline to link the source brought forward and installed mid 2020.
- Poroti WTP upgrade planned



# Drought... *What else did we do from a Lifeline Perspective?*

- Level 2 (sprinkler ban) restrictions were imposed on 26<sup>th</sup> February. The water restrictions along with a small amount of rain in March helped to reduce consumption by around 20% compared to February consumption.
- Level 3 (hose ban/standpipes etc) water restrictions imposed from 16<sup>th</sup> April. Reduced consumption by 25% compared to February.
- Whau Valley dam got down to 42% full in April 2020.
- Water restrictions lifted 27 June 2020 with Whau Valley dam reaching 74% full.
- Interestingly, the Covid-19 lockdown had little impact on demand.



# Drought... *What did we do from a Lifeline Perspective?*

- Stopped hydrant testing and pipe scouring.
- Called in all metered standpipes.
- Leak detection.
- Water carriers sent to Ruakaka Water Supply area – Wilsons Dam only got down to 59%.
- Recycled more water at the treatment plants.
- Commenced Hatea pipeline installation and Poroti pipeline installation.
- Six additional filling stations being installed.





## Drought – *Northland Situation*

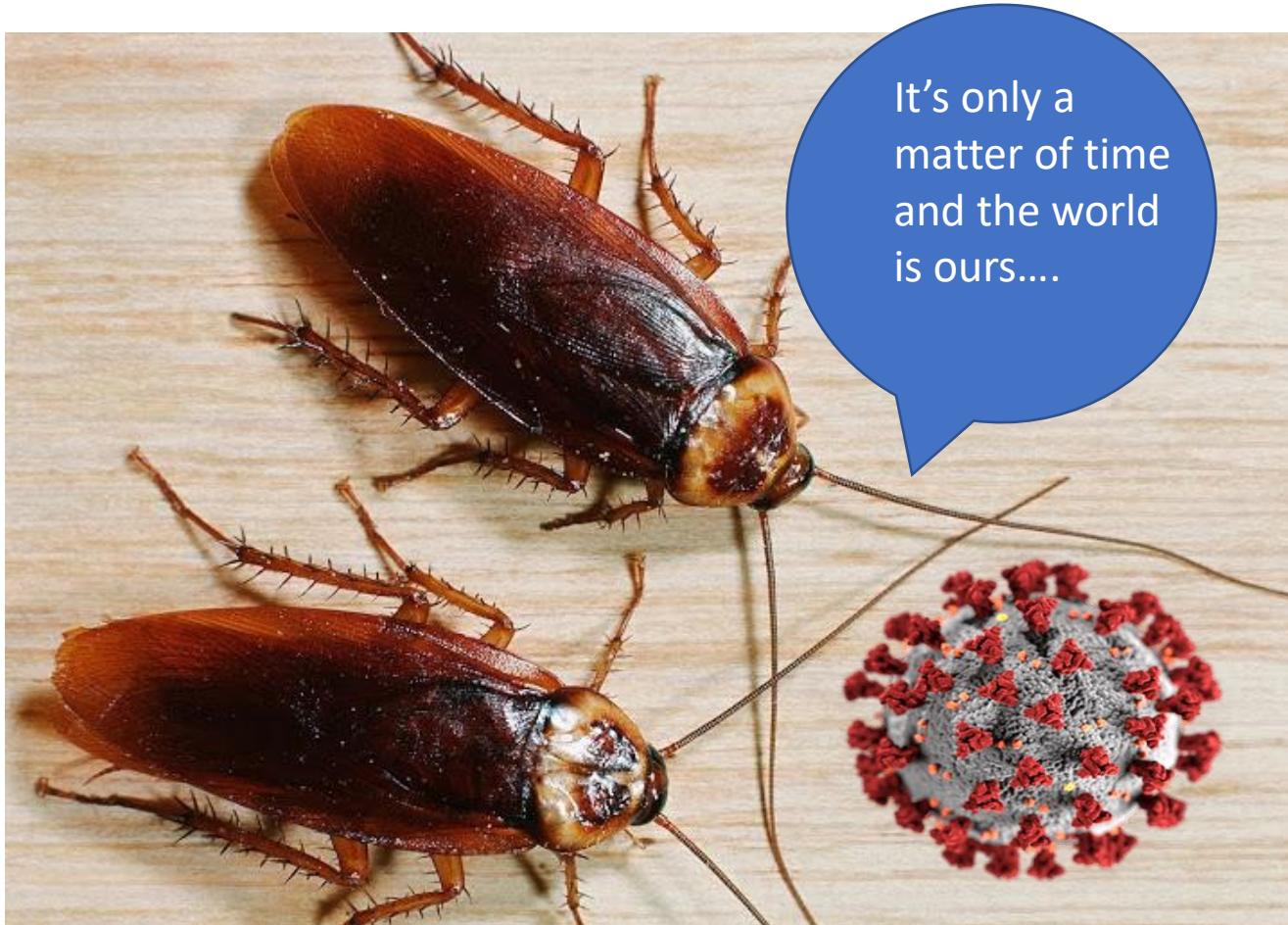
- Kaipara and Far North Districts had major water shortages.
- Self-suppliers - Significant number of tankers supplying water to Northland from the Whangarei and Ruakaka supplies.
- Civil Defence involved coordinating between districts.
- Provided an additional filling station.
- Industry challenges.
- 41,687m<sup>3</sup> of water for self suppliers via certified carriers. Kaipara District took 17,082m<sup>3</sup>.



# Drought - *Summary*

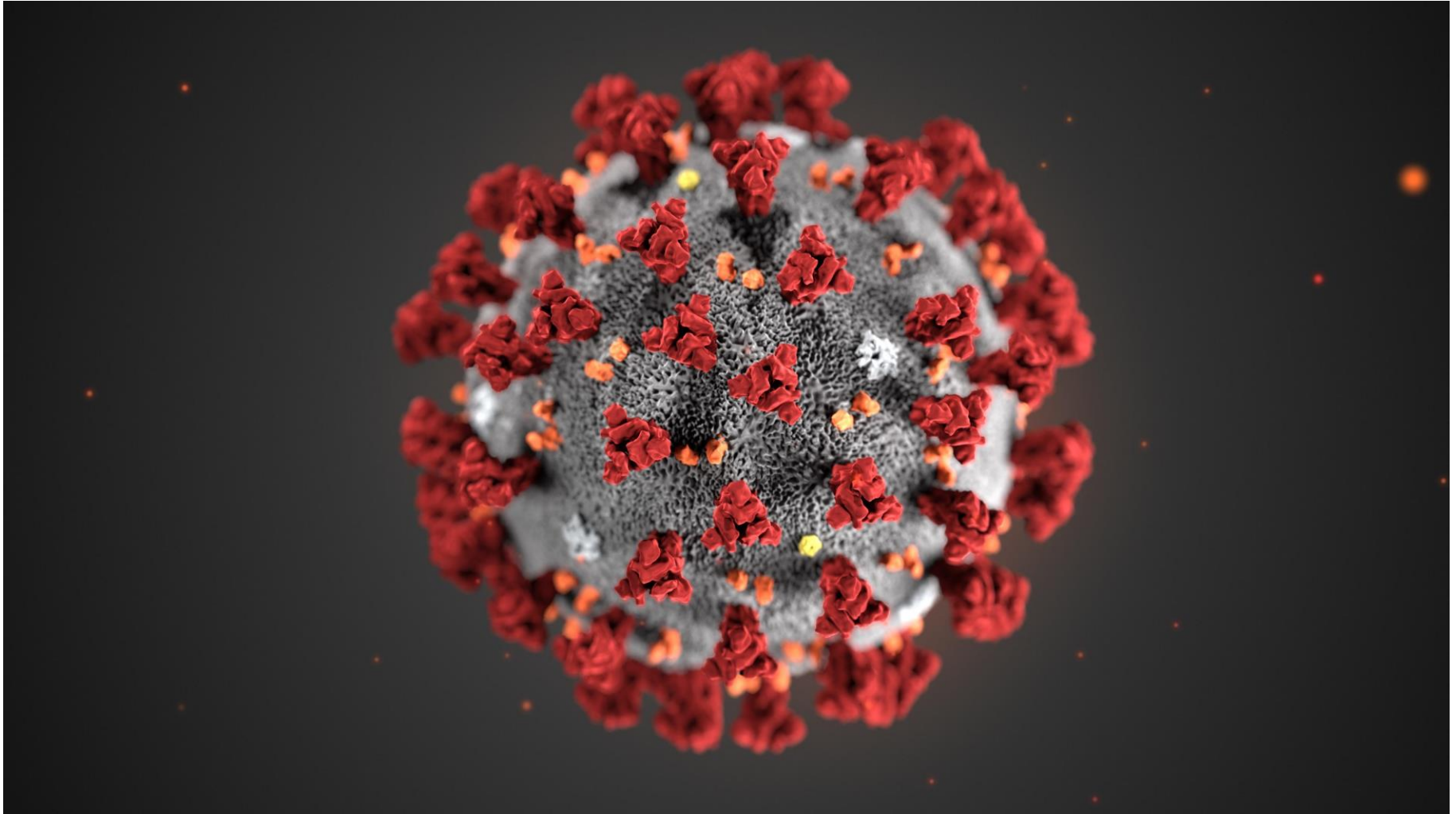
- Essential service – think about it...
- Take a low risk approach and start responding early – very early...(are your response plans conservative enough?)
- Escalate response earlier rather than later.
- Contingency plans – get on with them.
- Strengthen resilience.
- Importance of multiple sources and conjunctive use models.
- Conserve dams and increase take from run of rivers when you can.
- Involve community early – *20% saving*.
- Review impact weekly and respond promptly.
- Apply restrictions early enough.

...and Just before the pandemic,  
infestation!






# The Pandemic...







The  
Storm...

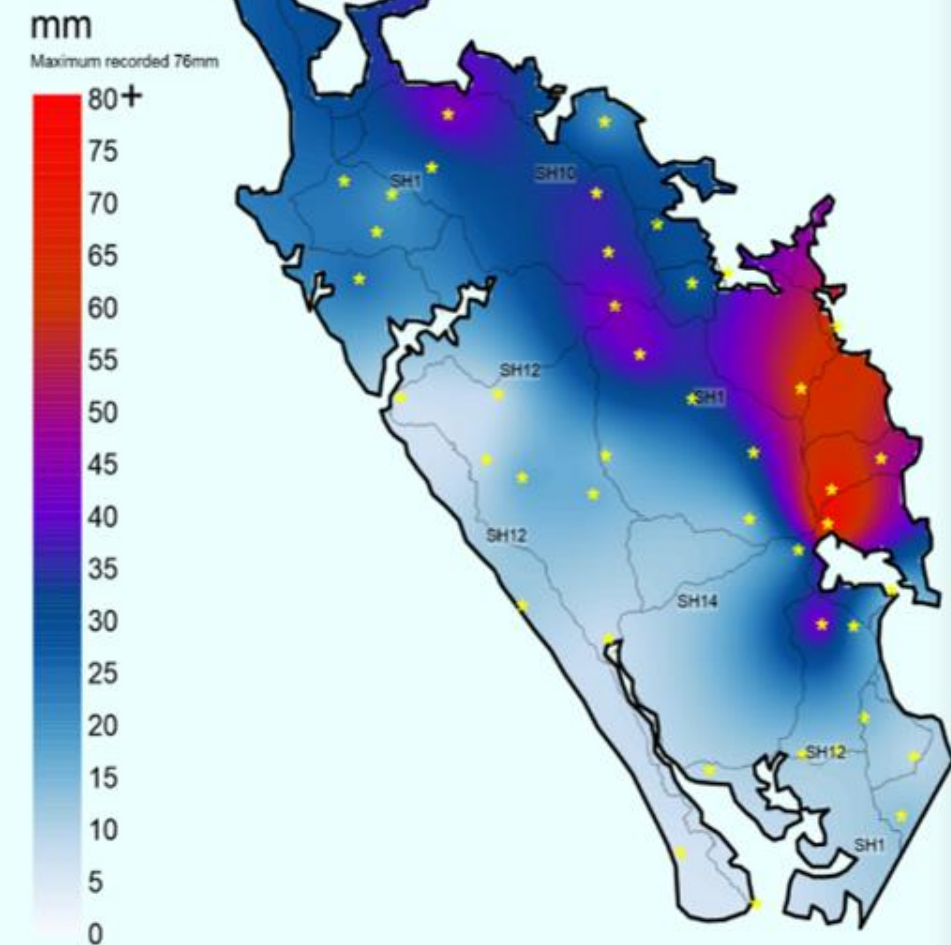


July 2020  
Dams are  
filling –  
Where's the  
road gone?

- July 17/18 weather event
- Short and sharp. Up to 88mm in 2 hours recorded at NRC rain gages
- July average at the dam 196mm
- July this year 401mm

## Storm Rainfall - 15-19 July 2020

Maximum 1 hour rainfall intensity in mm



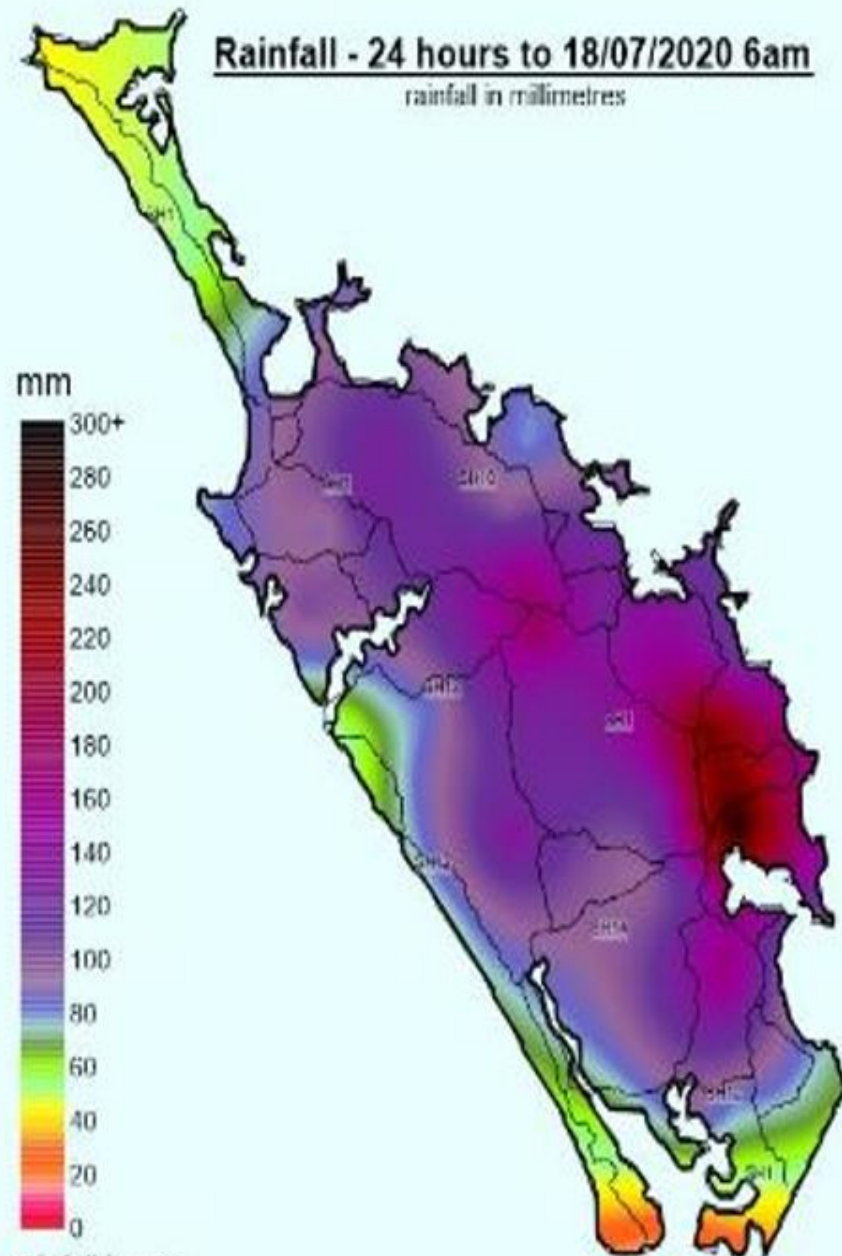
rainfall in mm

PROVISIONAL DATA ONLY

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## Rainfall - 24 hours to 18/07/2020 6am

rainfall in millimetres



rainfall in mm

PROVISIONAL DATA ONLY

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# Storm event - Wastewater Main Whangarei WWTP

- Dry weather flows 18MLD.
- Wet weather daily total flow 100MLD.
- Instantaneous max flow 146MLD.
  - Everything treated and UV'ed.
- Pump station storage and treatment facility in operation.



# Rain, and lots of it....

Area	12 hours 1800hrs 17 July – 0600hrs 18 July	24 Hours 0700hrs 17 July – 0700hrs 18 July
Glenbervie Forest	209.5mm	289.0mm
Puhipuhi	167.5mm	247.0mm
Whangarei CBD Water Street	172.4mm	209.0mm
Ngunguru Kaikatea Hills	139.0	199.5mm



Walton St Bridge  
Debris washed down the stream damaging stormwater / sewer lines

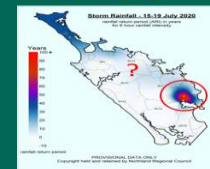
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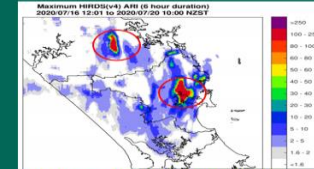
## 1:500 year storm ???

NRC rain gauge



NRC rain network detected 1x significant event. (1:80-1:100 year return period)

Weather Radar



Weather radar detected 2x significant events. (1:80-1:100 year return period)





Look at that -  
Dam Fantastic!

**WE'RE ALL GOOD HERE  
IN NORTHLAND**







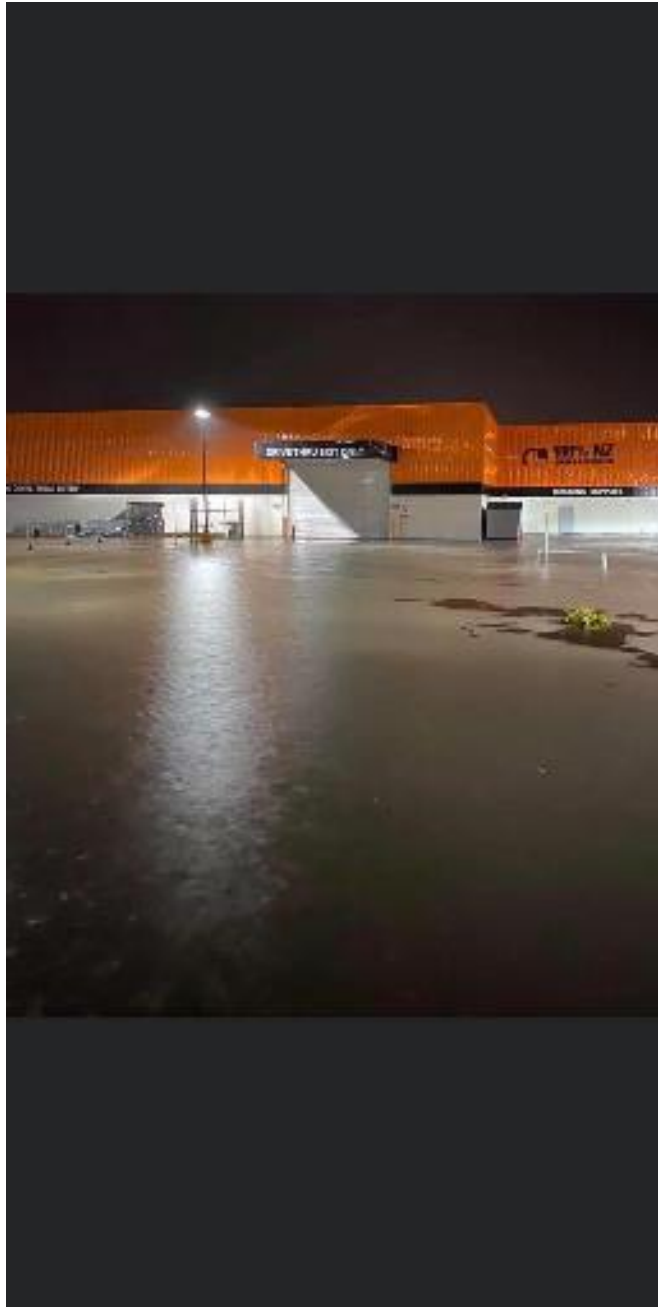
Poroti WTP flooded; Whau  
Valley Turbidity Problems

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*Keep Calm,  
and Conserve  
Water...  
Again*



**KEEP  
CALM  
AND  
DRINK  
TEA**



Flooding through  
businesses

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# Storm Summary...

- The biggest storm event will be the next storm!
- Make sure your intake pump station is well above flood level!!
- Relationships with FENZ and Police.
- MetService support for further events.
- Infrastructure investment saves lives.
- Just another day for Lifelines...



So What's  
next?

Remember the  
6P's...

*Perfect planning  
prevents \_\_\_\_\_ Poor  
performance*

Questions?

***Simon Weston – General  
Manager Infrastructure***

***Wednesday, 21<sup>st</sup> October 2020***

