From Risk Management to Resilience

Nigel Toms
Corporate Risk Manager

Chair of RiskNZ

Watercare
An Auckland Council Organisation

Watercare

- Auckland's water and wastewater service provider
- Council-controlled organisation since 2010
- Serve 1.4 million Aucklanders
- Deliver 360 million litres of water daily
- Treat 458 million litres of wastewater daily
- 958 staff

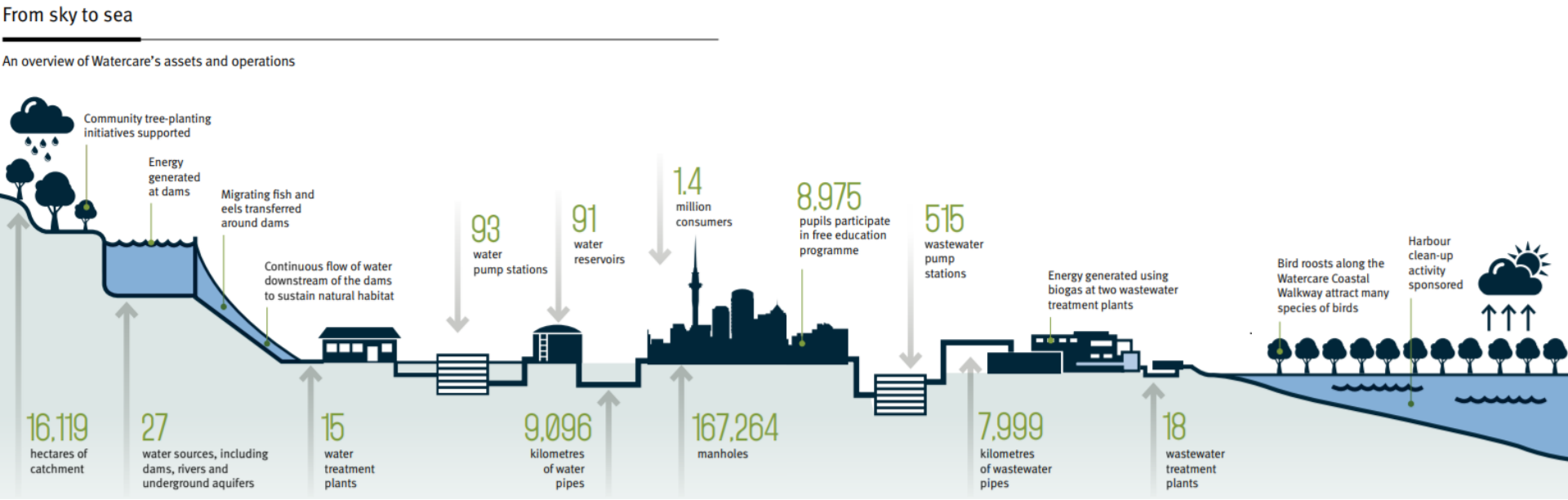
Watercare
An Auckland Council Organisation

Operations and Assets

- Head office in Newmarket
- 5 operational hubs
- 1 laboratory
- Assets (book value) $8.9 billion including:
  - 33 water/wastewater treatment plants
  - 16,800 kilometres of water/wastewater pipes
  - 89 water reservoirs
  - 608 water/wastewater pump stations
  - 167,264 manholes
- Plan to invest $4.9 billion over the next 10 years

Wastewater treatment

From Sky to Sea



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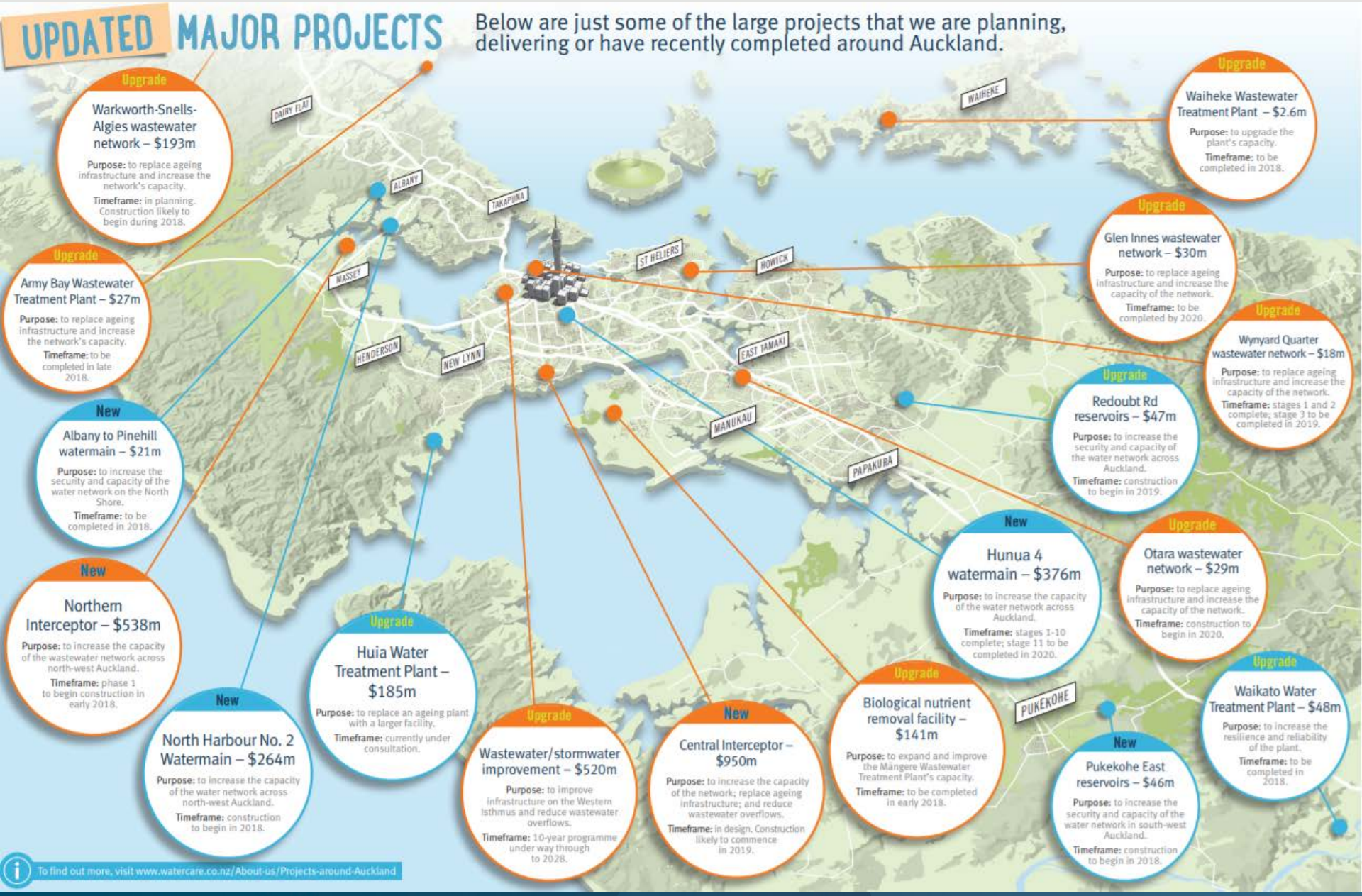
UPDATED MAJOR PROJECTS

Below are just some of the large projects that we are planning, delivering or have recently completed around Auckland.



Upgrade
Warkworth-Snells-Algies wastewater network – $193m
Purpose: to replace ageing infrastructure and increase the network's capacity.
Timeframe: in planning. Construction likely to begin during 2018.

Upgrade
Army Bay Wastewater Treatment Plant – $27m
Purpose: to replace ageing infrastructure and increase the network's capacity.
Timeframe: to be completed in late 2018.

New
Albany to Pinehill watermain – $21m
Purpose: to increase the security and capacity of the water network on the North Shore.
Timeframe: to be completed in 2018.

New
Northern Interceptor – $538m
Purpose: to increase the capacity of the wastewater network across north-west Auckland.
Timeframe: phase 1 to begin construction in early 2018.

New
North Harbour No. 2 Watermain – $264m
Purpose: to increase the capacity of the water network across north-west Auckland.
Timeframe: construction to begin in 2018.

Upgrade
Huia Water Treatment Plant – $185m
Purpose: to replace an ageing plant with a larger facility.
Timeframe: currently under consultation.

Upgrade
Wastewater/stormwater improvement – $520m
Purpose: to improve infrastructure on the Western Isthmus and reduce wastewater overflows.
Timeframe: 10-year programme under way through to 2028.

New
Central Interceptor – $950m
Purpose: to increase the capacity of the network; replace ageing infrastructure; and reduce wastewater overflows.
Timeframe: in design. Construction likely to commence in 2019.

Upgrade
Biological nutrient removal facility – $141m
Purpose: to expand and improve the Māngere Wastewater Treatment Plant's capacity.
Timeframe: to be completed in early 2018.

New
Hunua 4 watermain – $376m
Purpose: to increase the capacity of the water network across Auckland.
Timeframe: stages 1-10 complete; stage 11 to be completed in 2020.

Upgrade
Redoubt Rd reservoirs – $47m
Purpose: to increase the security and capacity of the water network across Auckland.
Timeframe: construction to begin in 2019.

New
Pukekohe East reservoirs – $46m
Purpose: to increase the security and capacity of the water network in south-west Auckland.
Timeframe: construction to begin in 2018.

Upgrade
Waiheke Wastewater Treatment Plant – $2.6m
Purpose: to upgrade the plant's capacity.
Timeframe: to be completed in 2018.

Upgrade
Glen Innes wastewater network – $30m
Purpose: to replace ageing infrastructure and increase the capacity of the network.
Timeframe: to be completed by 2020.

Upgrade
Wynyard Quarter wastewater network – $18m
Purpose: to replace ageing infrastructure and increase the capacity of the network.
Timeframe: stages 1 and 2 complete; stage 3 to be completed in 2019.

Upgrade
Otara wastewater network – $29m
Purpose: to replace ageing infrastructure and increase the capacity of the network.
Timeframe: construction to begin in 2020.

Upgrade
Waikato Water Treatment Plant – $48m
Purpose: to increase the resilience and reliability of the plant.
Timeframe: to be completed in 2018.

To find out more, visit www.watercare.co.nz/About-us/Projects-around-Auckland

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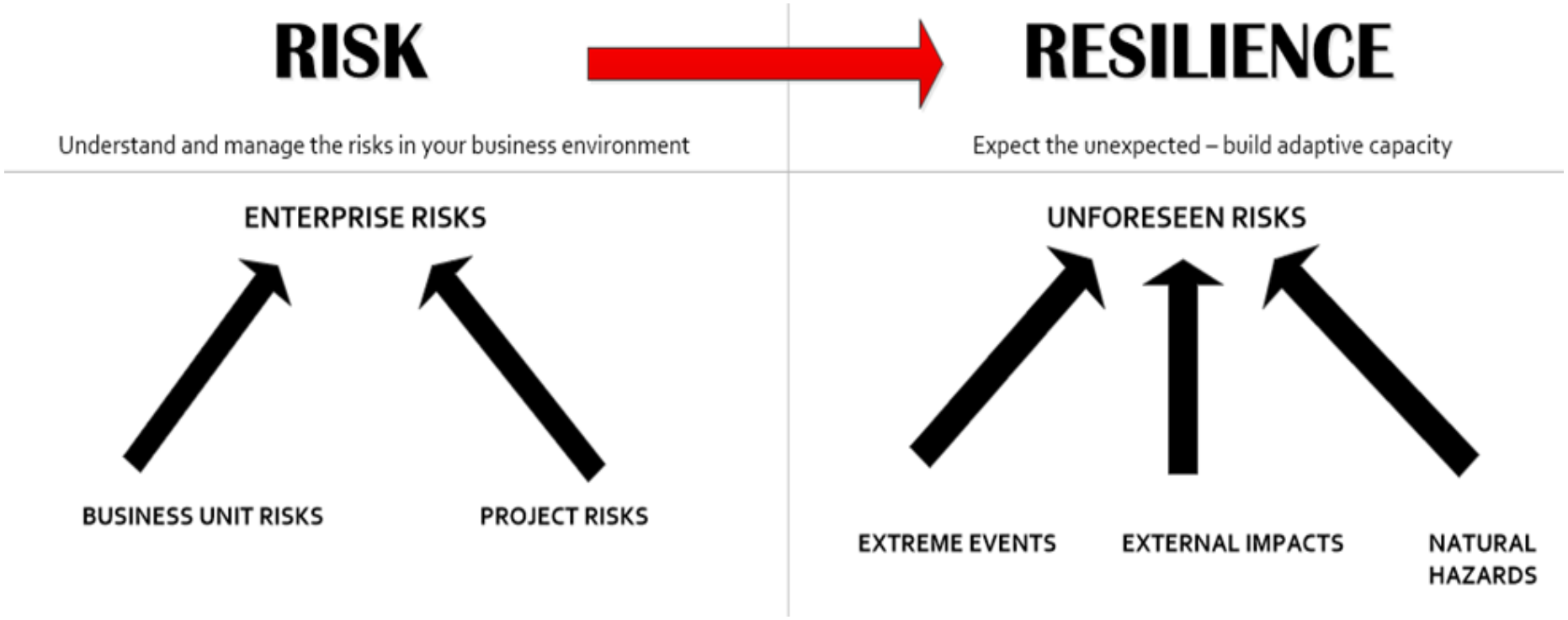
Risk management to resilience



Risk Management

Proactive Approach

Identify the risks

Understand the consequences

Act to manage the position

Risk Governance Structure

Board

Audit & Risk Committee

Chief Officers / General Managers } Risk Management Steering Committee

Business Unit Managers

Key Risk Documents

ISO 31000 – Risk Management Guidelines

- Enterprise risk policy
- Enterprise risk framework
- Business unit / Chief risk registers
- Enterprise risks reported to the Board

Risk management used in decision making

Deciding Overall Enterprise Risks

Enterprise risks identified by the Executive /Board

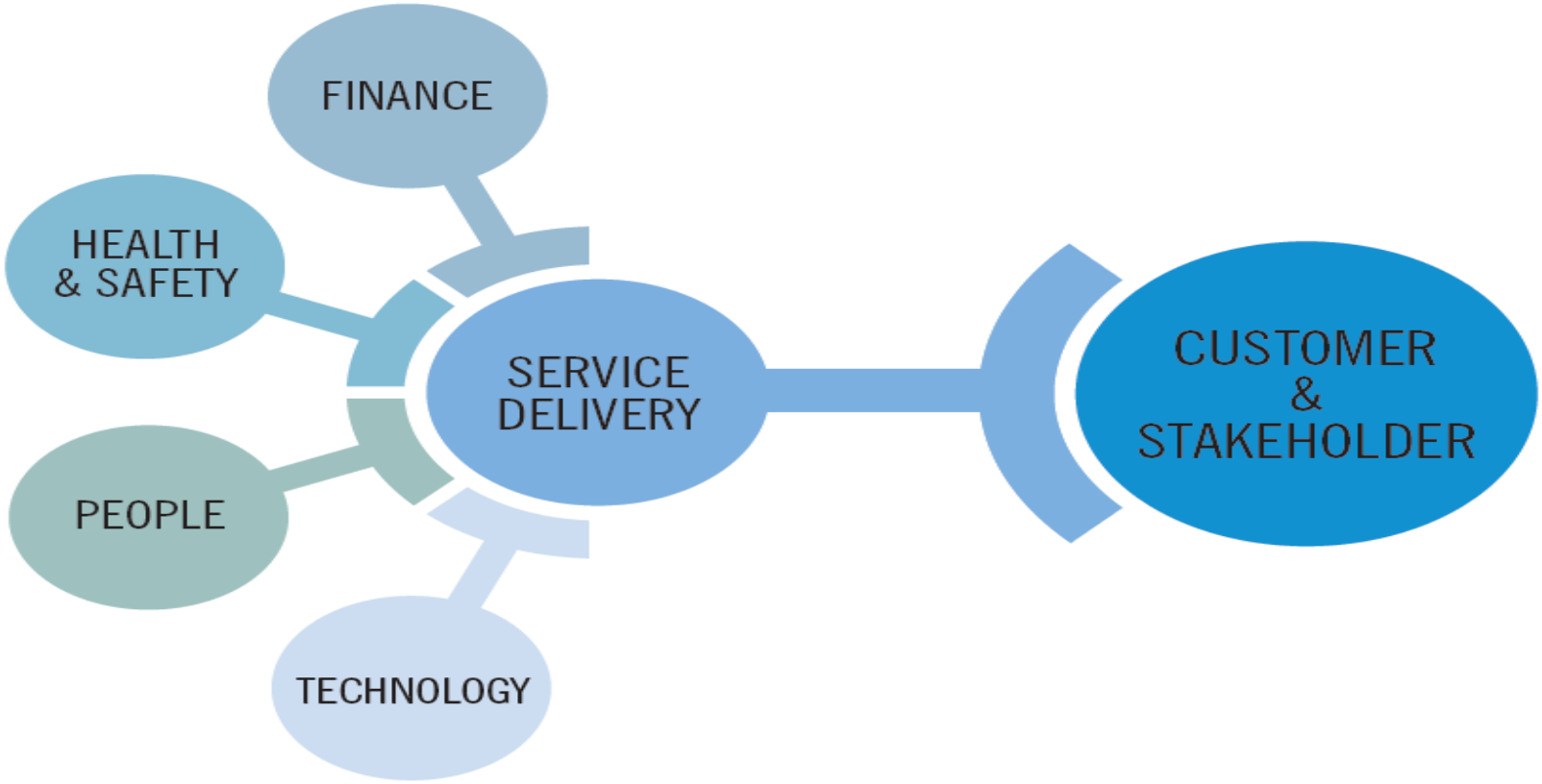
Compare: decide overall top risks

Filter

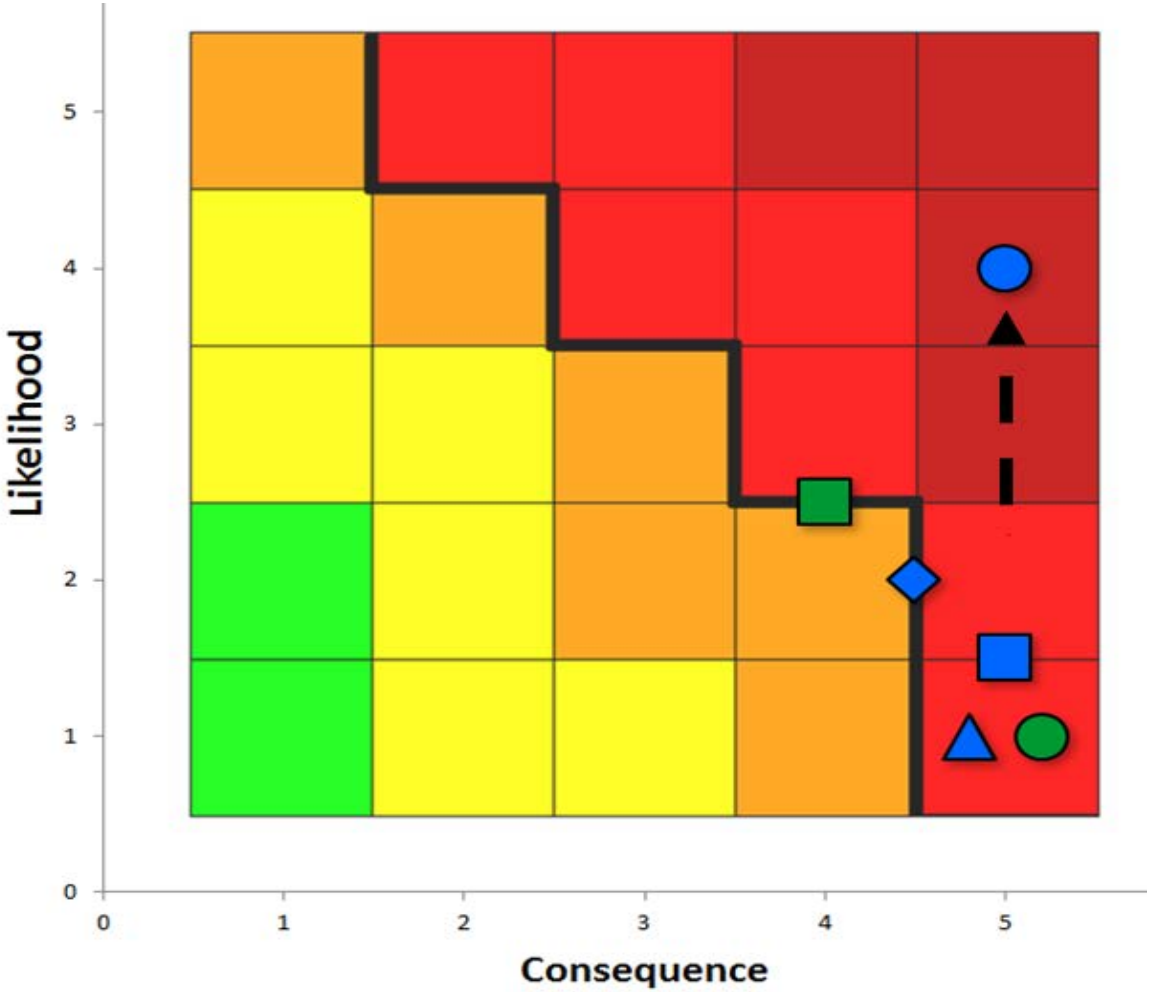
Challenge } RMSC

Enterprise risks identified by Business Units

Strategic risk areas



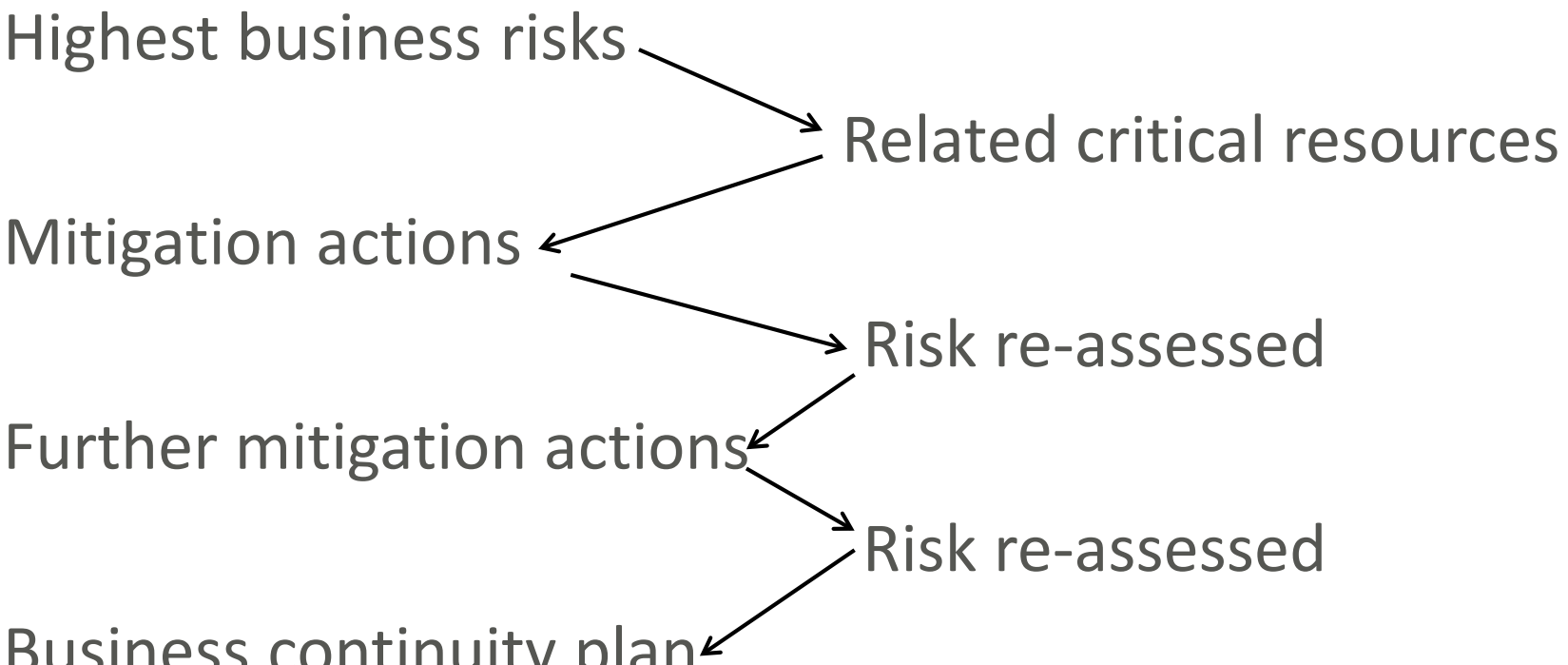
Presentation of enterprise risks



Resilience Stage 1

Time for the Incident Management Plan

Risk Management and Business Continuity

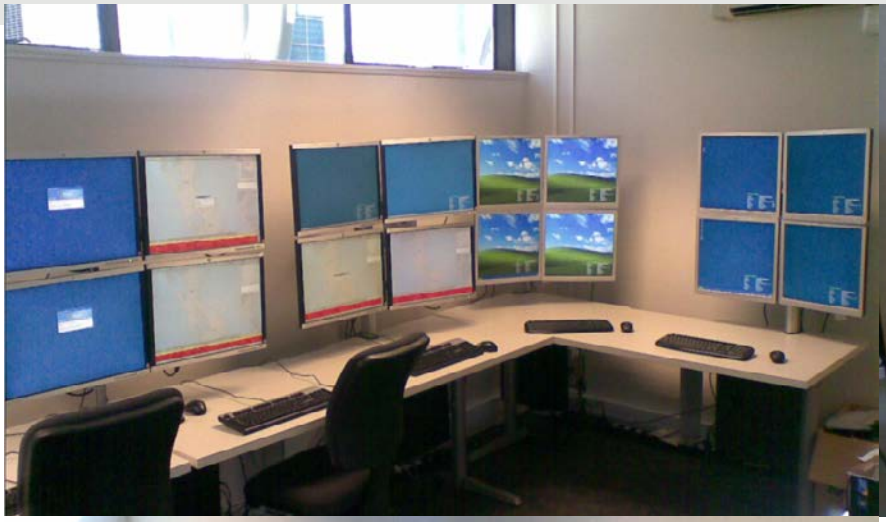


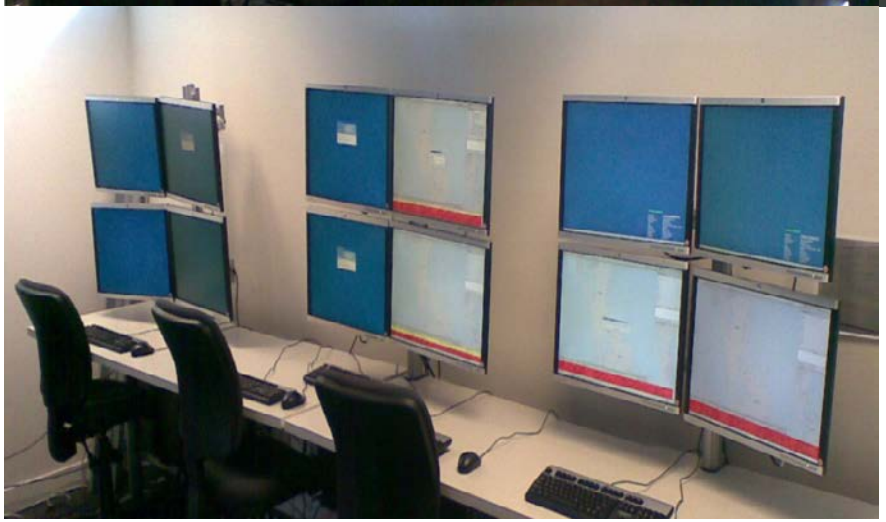
*Trigger points for all BCPs

Key Elements of the BCP

- Communicate – Escalate advise management
- Make safe
- Short term fix – practical e.g. manual operation
- Longer term – repair or replace

Duplicate - Back Up Control Room





Same essential features as main control room

Hot standby – ready to operate

Regular tests of transfer of control

Insurance

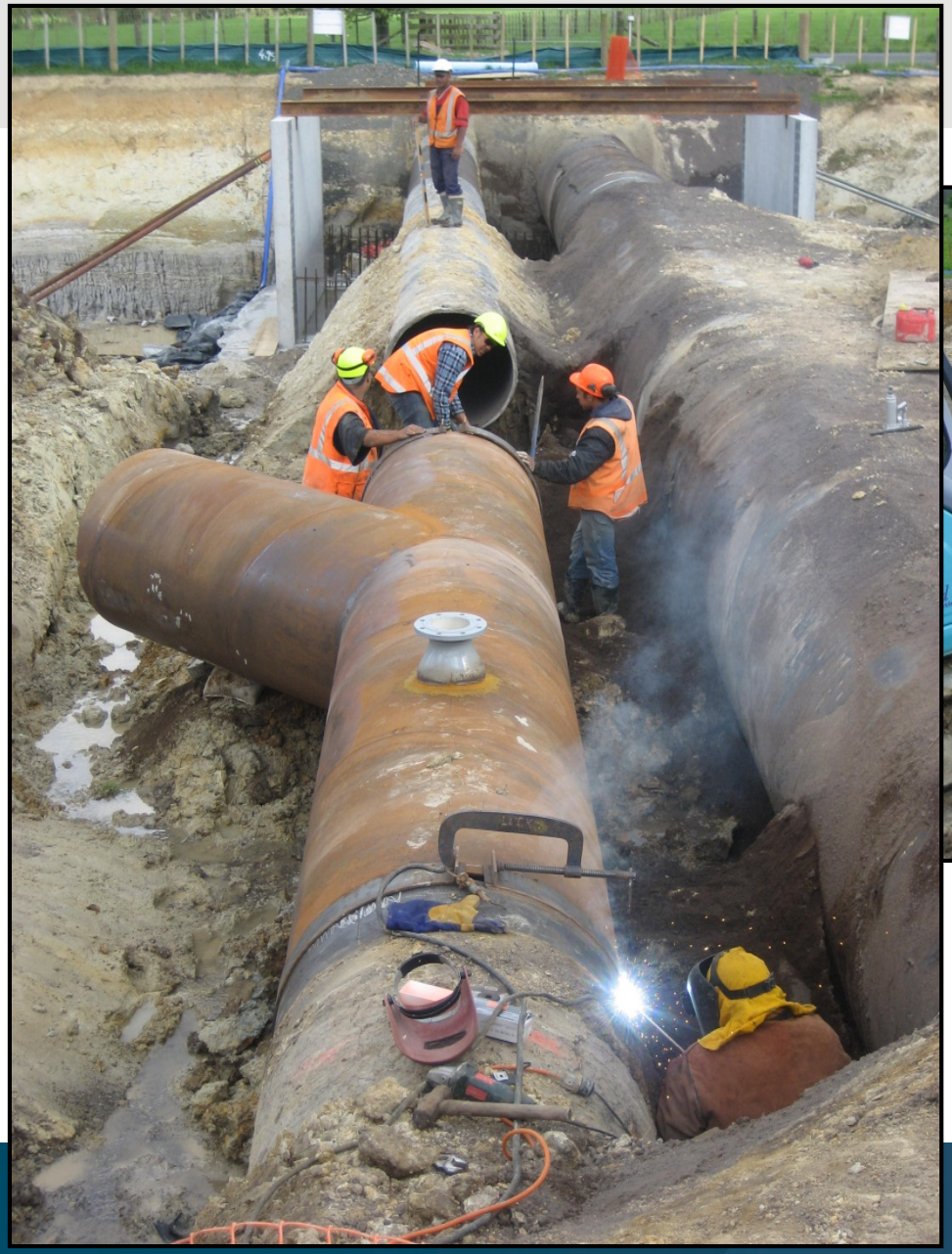
Some money back after the event if covered by your policy !!!

Resilience Stage 2

Resilience Stage 2

- History – Previous failures / issues
- Most important / biggest impact
- Most critical to provision of services
- Reserves held
- **Critical materials / suppliers**
- **Critical contractors**

Harden



Strengthen

Design Stage - Pump Station

Cyber Example

Prevent – IS Use Policy / Staff Education

Protect – Patching / Updates / Anti-Virus

Detect – Specialist intrusion software

Respond – Incident Management Plan + IS BCP + Cyber insurance support panel

Recover – Forensic and technical support

Resilience 3

Does Not Mean It Cannot Happen

- Extremely rare
- Very low likelihood of occurrence
- 1 in 500 year event
- Not foreseeable
- Not in the last 100 years
- Not in our planning horizon

Cover the Obvious – No Excuses

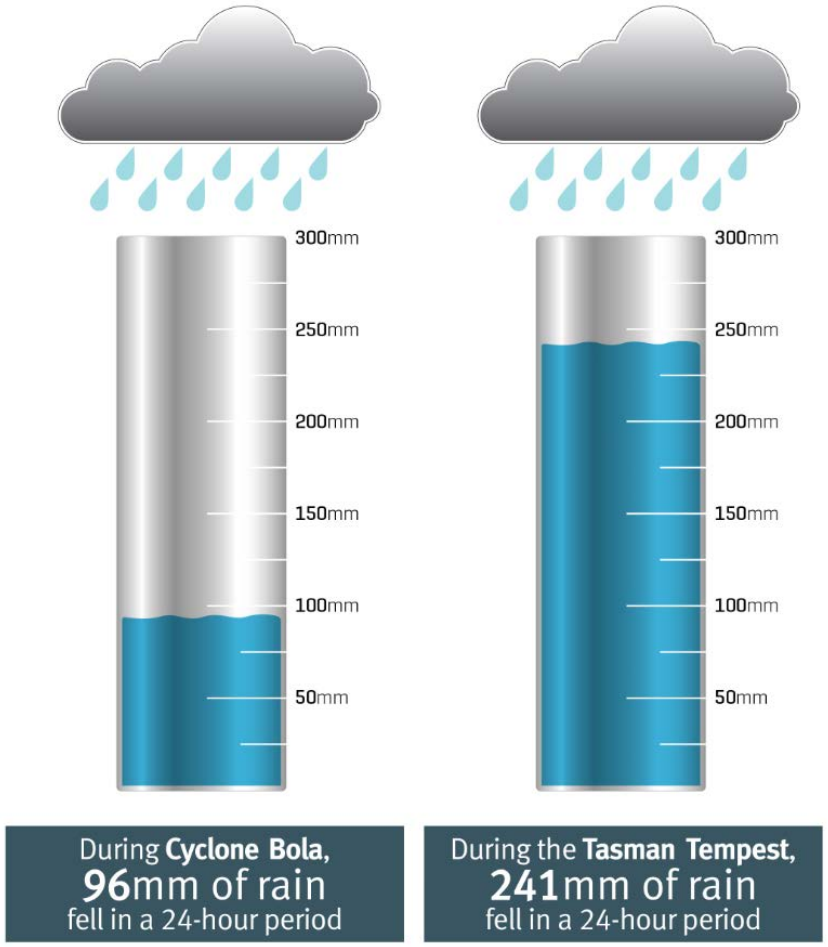
Loss of:

- Electricity
- Gas
- Water / sewerage
- Telecommunications
- IS Systems and Capability

The Challenge of Extreme Events

Aucklanders face largest water crisis in 23 years

Two months' rain in 12 Hours



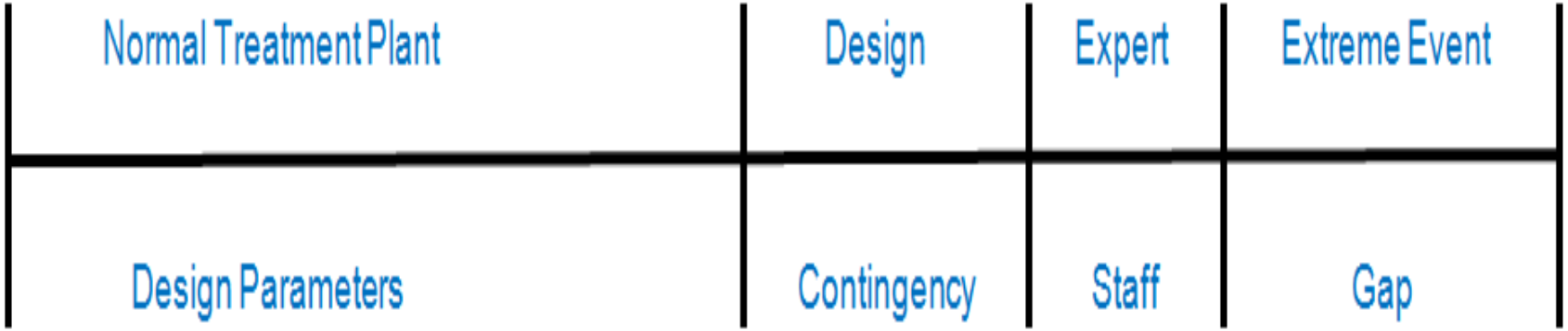
More silt than water?

Ardmore treatment capacity reduced

Highly resilient infrastructure

- Water treatment plants operating as planned
- Exceeding all design parameters
- Designed with significant contingency
- Operated by expert staff

The capability gap in extreme events



Watercare urges Aucklanders to reduce water use in wake of torrential rain

Last updated 17:31, March 9 2017

CHRIS MCKEEN/FAIRFAX NZ

Watercare is calling for "voluntary savings following an extraordinary and unprecedented weather event in the Hunuas".

Water, water everywhere - and not a drop to drink.

Aucklanders are being urged to reduce their water consumption after torrential rain pummeled the region on Tuesday and Wednesday.

The Ardmore Water Treatment Plant - which is sourced from four water storage dams in the Hunua Ranges - is treating 50 per cent less water than usual in the wake of the wild weather.

Increase capacity + Reduce Consumption

- More staff – 24-hour manning to nurse key water treatment plants
- Additional staff and other resources required – drawn from across the business

- Leverage relationships with major commercial water users
- Voluntary reduction is preferable to mandatory restrictions or partially treated water

Future Resilience Challenge

UK Met Office study findings 2017

- There is an increased risk of ‘unprecedented’ winter downpours
- High risk of record-breaking rainfall in England and Wales in the coming decade
- These events could break existing records by up to 30 per cent

The future resilience challenge

How to prepare if:

- **Not** foreseeable
- Scale beyond normal capacity to respond
- Organisation wide impacts
- Challenges the organisations current culture

New approach required

Enhance and enable the organisations ability to react and adapt – **Adaptive Capacity**:

- Leadership and management
- Change ready people and systems
- Operations and technology
- Extended support networks and relationships

Guided by new enhanced resilience standards

Leadership and management

- Leaders are decisive leaders trained to manage with incomplete information
- Clear roles, chain of command, nominated deputies and extended delegations
- Strong succession planning
- Corporate knowledge retained and re-used

Change ready people and systems

- Staff trained to innovate and problem solve
- Key staff and critical capabilities identified
- Learn from experience with a searchable knowledge base
- Plans regularly tested
- Seek opportunity to improve responses in times of adversity

Operations and technology

- Close relationships with key vendors and suppliers
- Smart networks and systems that identify problems early
- Systems and processes can be flexed to support event response
- Reserve equipment ready to deploy

Networks and relationships

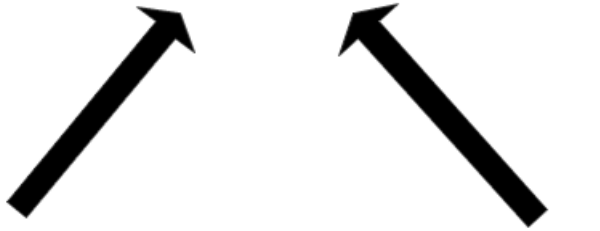
- Collaboration with external partners and contractors
- Able to find knowledge and expertise quickly
- Support / assistance agreements with similar organisations
- Engage and maintain relationships with regulators and authorities

Recap – Risk management to resilience

RISK

Understand and manage the risks in your business environment

ENTERPRISE RISKS



BUSINESS UNIT RISKS

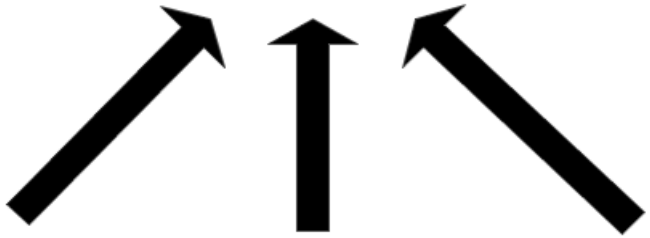
PROJECT RISKS

- Foreseeable risks
- Assess with current controls
- Planned mitigation actions
- Business continuity/contingency plans with trigger points for high residual risks

RESILIENCE

Expect the unexpected – build adaptive capacity

UNFORESEEN RISKS



EXTREME EVENTS

EXTERNAL IMPACTS

NATURAL HAZARDS

- Not foreseeable
- Scale beyond normal capacity to respond
- Organisation-wide organic capacity needs to be developed to successfully respond
- Cultural change - building capacity across people, technology, critical infrastructure, key stakeholder/ suppliers and external networks

Questions

Email: nigel.toms@water.co.nz