



**ROTORUA
LAKES COUNCIL**

STORMWATER SERVICES

Infrastructure and Environment Committee – 4
October 2023

STRATEGIC OUTCOMES

- Flood risk reduction
- Water quality protection
- Safe future growth
- Climate resilience adaptation



WE WANT TO AVOID

Ngongotaha 2018



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WE WANT TO AVOID



Pukehangi 2022

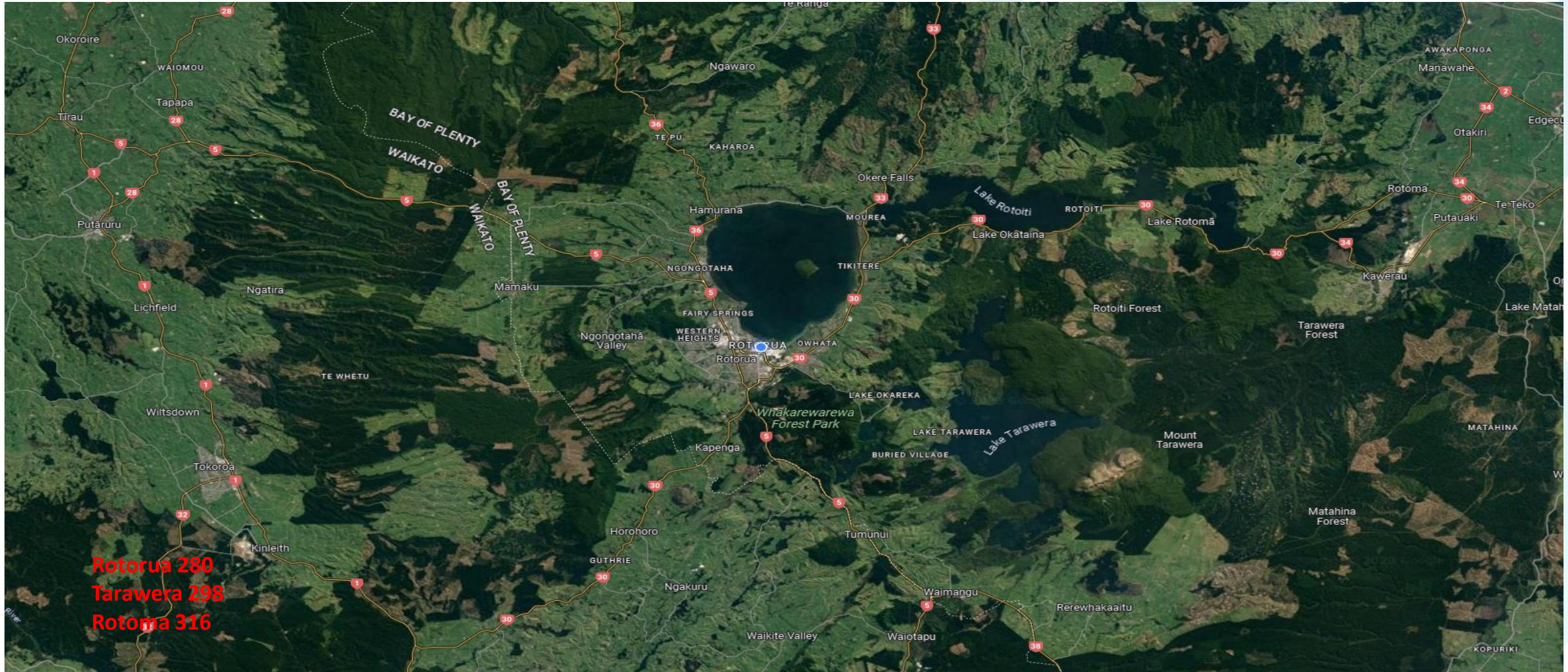
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KEY DISTRICT METRICS

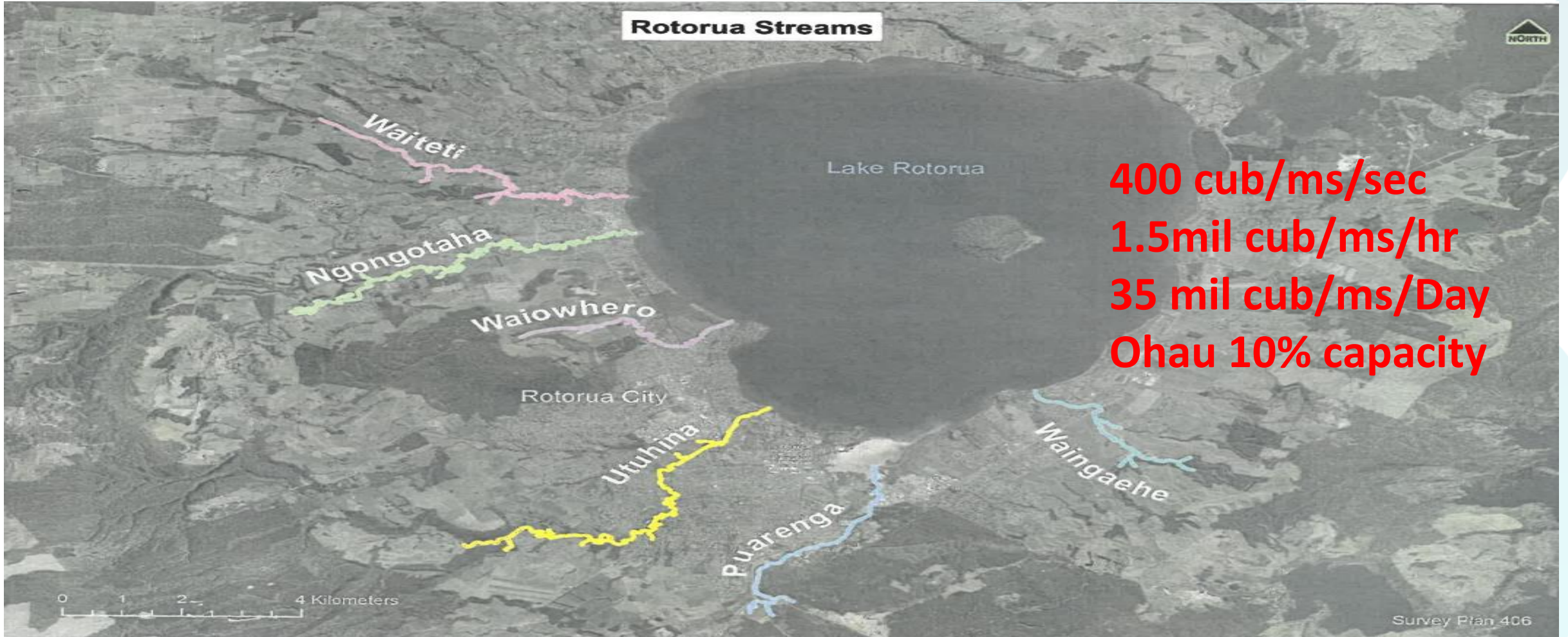
- District area - 2500 kms/sq
- Annual average rainfall - 1400 mm
- Recent rainfall - 2500 to 3000mm
- Average rain volume per annum - 3.5 B cub/mecs
- Lakes storage - approx. 5.0 B cub/mecs
- Runoff to Rotorua lake 1% AEP - 1.5 M cub/mcs/hr
- Climate change forecasts upwards



TERRAFORMING CALDERA

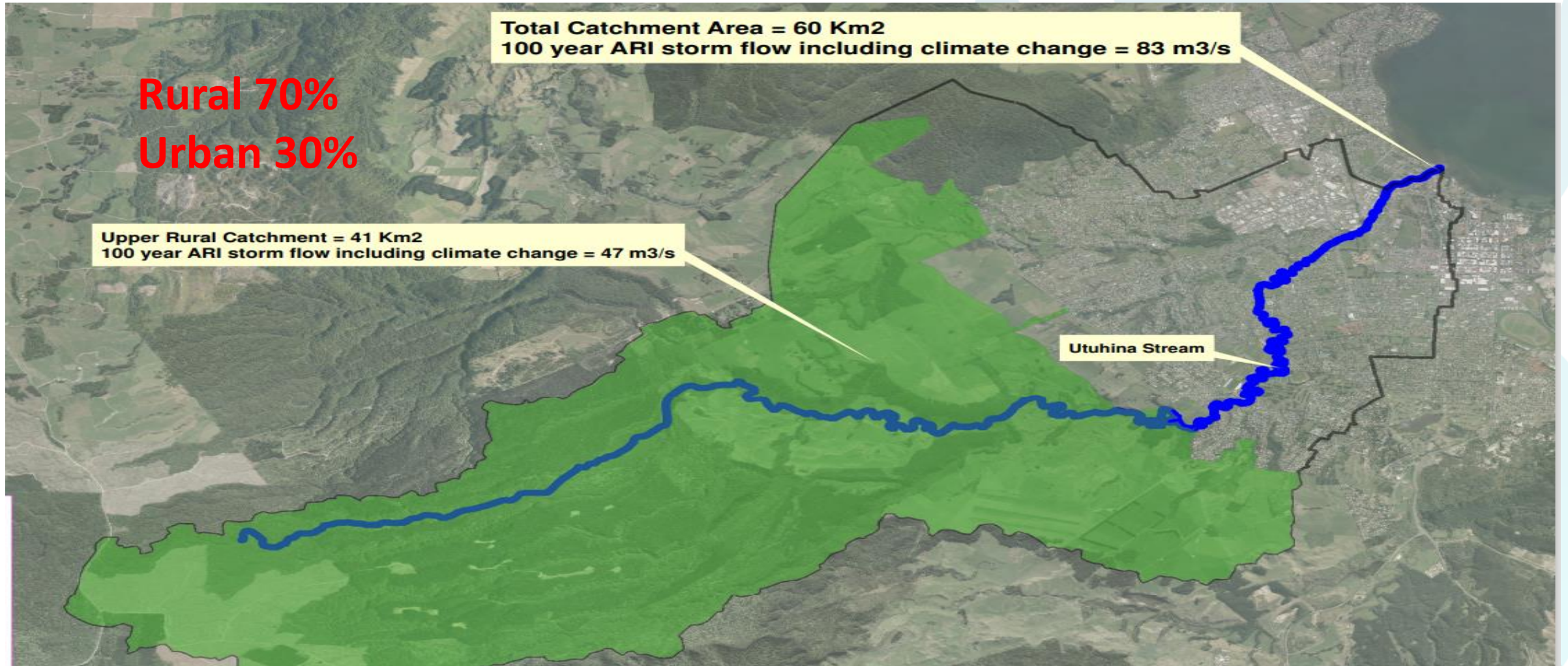


SCALE OF SW VOLUMES



400 cub/ms/sec
1.5mil cub/ms/hr
35 mil cub/ms/Day
Ohau 10% capacity

URBAN BURDEN



THE CALDERA EFFECTS

- Lakes are major attenuation systems
- Rotorua NO major flooding history
- Lake level management a significant factor
- Stream management/capacity very important
- Piped and overland paths complimentary
- 10% of public space needs to support 90% of private space – controls are critical



NEED FOR STREAMS MANAGEMENT



Ngongotaha Stream post 2018 event/BOPRC



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URBAN CHALLENGES

- Urban Area 50 Sq/Kms – 2% of District
- Private Properties 90% of urban footprint
- Public Space (roads/reserves) 10%
- Local flooding mainly from private systems
- Mixed effects – High runoff/urban contamination
- But less siltation
- Options to improve water quality /debris -OPEX



URBAN CHALLENGES



RURAL CHALLENGES

- Rural Area 98% of District
- Access corridors at risk (750 kms)
- High concentration volumes in saturation
- Mostly overland paths and limited piped network
- Mixed effects – High siltation/nutrients loss
- Less of urban pollution
- Options to improve drainage systems/resiliency



RURAL CHALLENGES

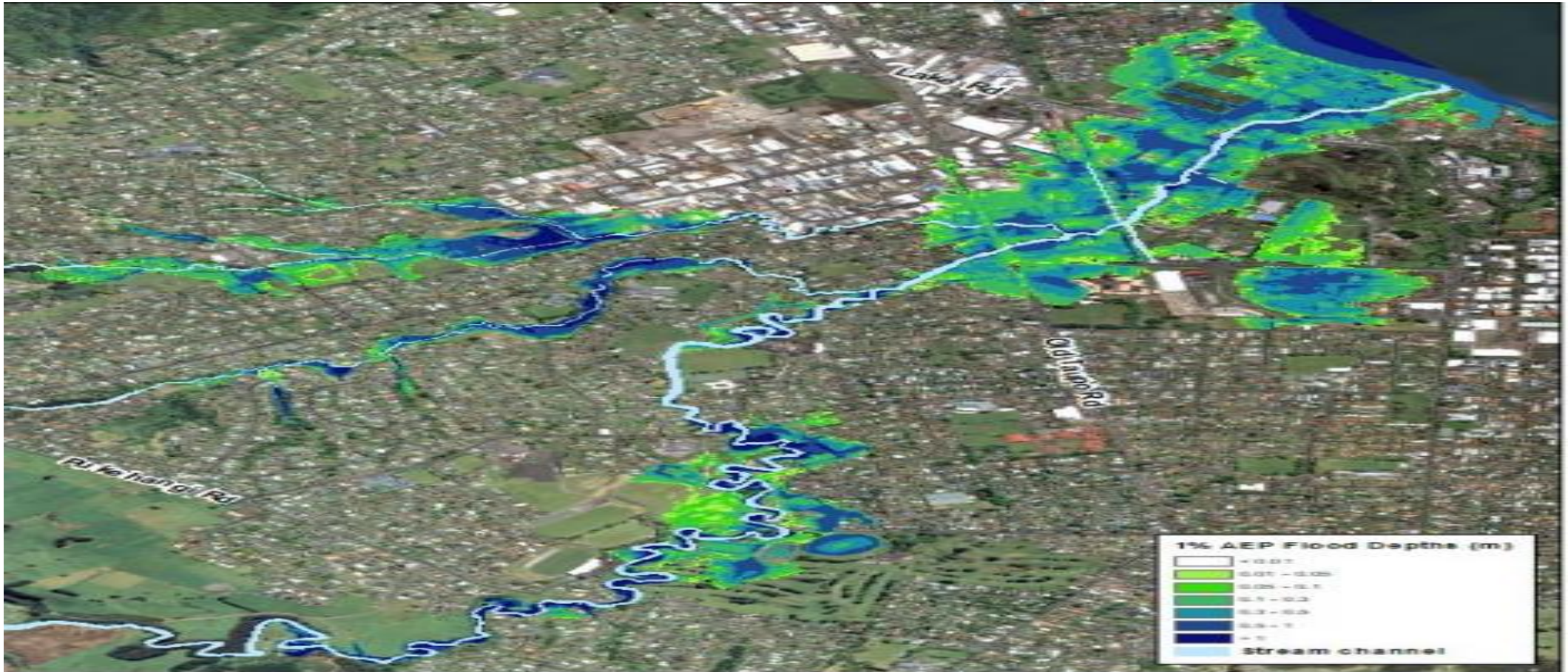


THE SW MASTER PLAN

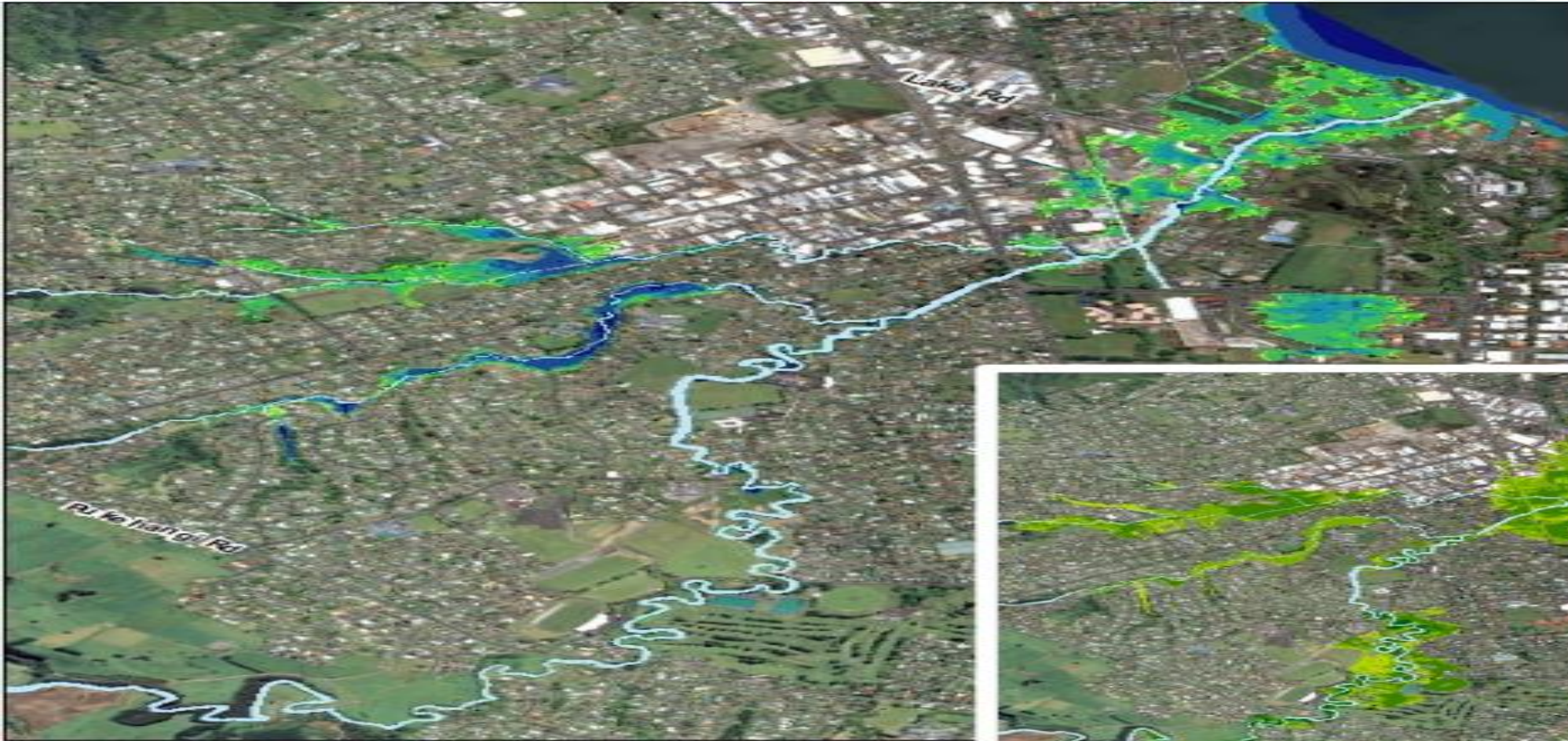
- Streams are arterial conveyance like traffic
- Detain high volumes of SW until arterials clear (attenuation/storage dams)
- Preference on overland paths less in pipes
- Better to flood a road than a house



FLOOD MODEL NO MITIGATION



FLOOD MODEL UPSTREAM MITIGATION



od map, 1% AEP, 2130 climate, "no upstream inflow"

Effect on flood depth, 1% AEP, 2130 climate, "no upstream inflow"

THE SW MASTER PLAN



THE SW MASTER PLAN

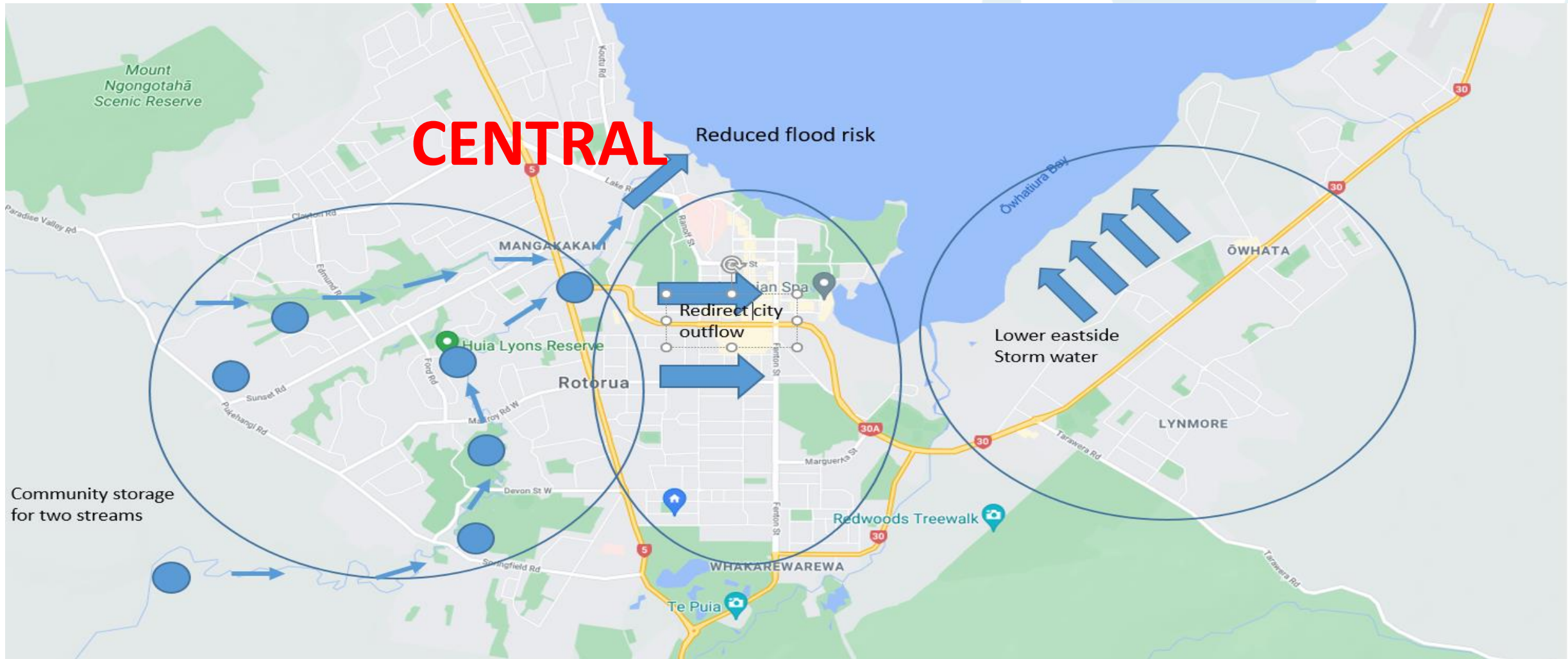


WEST LINTON PARK



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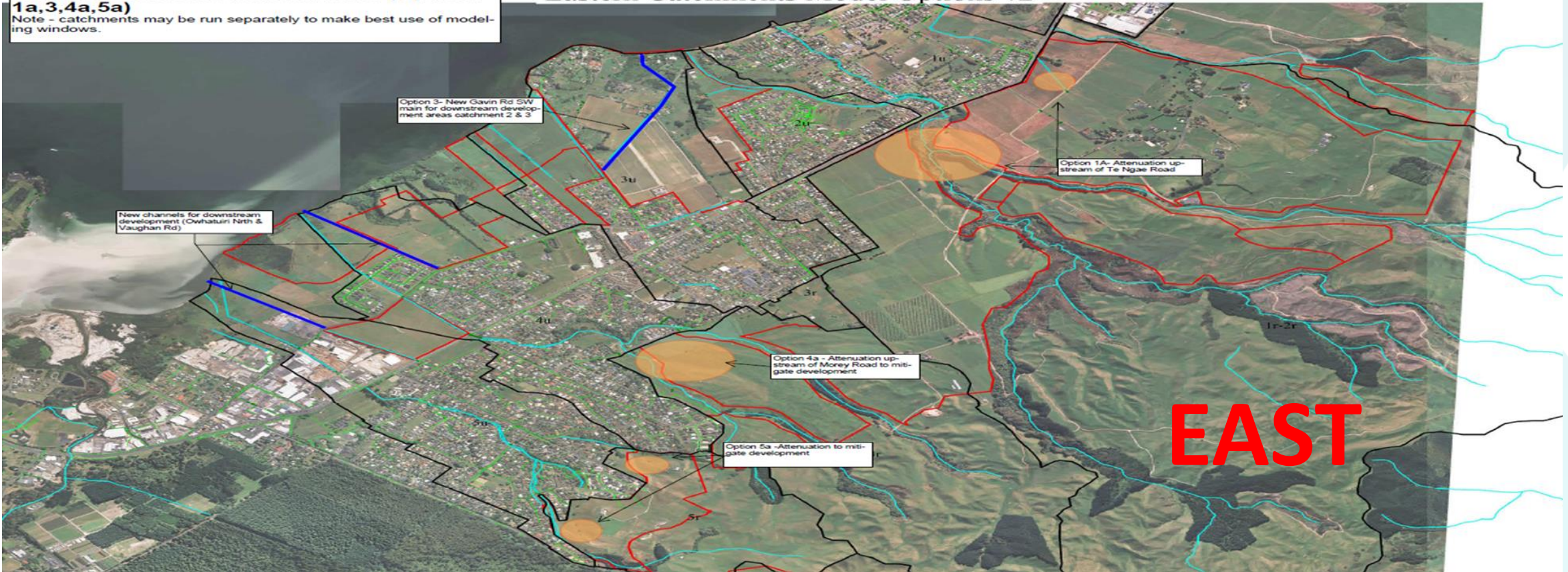
THE SW MASTER PLAN



THE SW MASTER PLAN

Attenuation focused model run/s (Options 1a,3,4a,5a)
Note - catchments may be run separately to make best use of modeling windows.

Eastern Catchments Model Options v2



THE SW MASTER PLAN



EAST – Morey Street Dams



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BROAD SW SERVICE METRICS

Key Asset Components	Quantity
Pipes and tunnels (urban)	285 kms.
Open Drains	153 Kms
Streams (urban)	9
Catchments	7 + 29 Sub
Mains – <i>Most are concrete pipe materials and are half to two thirds through their design life. Capacity for 10% average rainfall</i>	



Cost Synopsis of Stormwater

Element	Stormwater
MASTER PLAN (7 Yrs) (IAF)	\$100 M
Current Replace Value \$	\$250 M
Ops \$	\$2.2 M p.a.
Dep/Renewal \$	\$3.3 M p.a.
Indirect \$	\$1.4 M p.a.
TOTAL	\$6.9 M p.a.
COST RISK	Escalating Regulations



Additional Stormwater Assets & Costs

- Upgraded Network (Capital and Opex/Renewals)
- IAF – External funding but on-going Maintenance
- Consenting Conditions (quality monitoring)
- Community expectations (quality/contamination)
- Land Development enabling interventions



RISKS AND FUNDING ISSUES

COST PRESSURES	<ul style="list-style-type: none">• FRESHWATER REGULATIONS/COMPLIANCE• CULTURAL IMPACTS & CONSENTS CONDITIONS• AFFORDABILITY OF NEW SCHEMES (CAPITAL AND OPS)• RISK CONTROL EXPECTATIONS/CLIMATE CHANGE• PRIVATE NETWORKS EFFECTS - COST DISTRIBUTION
RISKS	<ul style="list-style-type: none">• ABATEMENT NOTICES / AGING NETWORK/• HEALTH RISKS & WATER QUALITY• FUTURE DEVELOPMENT CAPACITY• EMERGING CONTAMINANTS REGULATIONS• ACCESS TO SAFE DISCHARGE POINTS• DEMAND TO MINIMISE FLOOD RISK• LAKE CONTROLS NOT OURS
ACTIONS/DECISIONS AHEAD	<ul style="list-style-type: none">• SW MASTER PLAN DELIVERY/IAF• COMPREHENSIVE RESOURCE CONSENT for SW• THREE WATERS REFORMS AND PLANNING• DEVELOPMENT CONTRIBUTIONS (FUNDING & REVENUE)

