

Nutrient offsetting in the Caboolture River

How Unitywater is planning to maintain Environmental Values in a catchment facing massive population growth



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What is the problem with the Caboolture River?

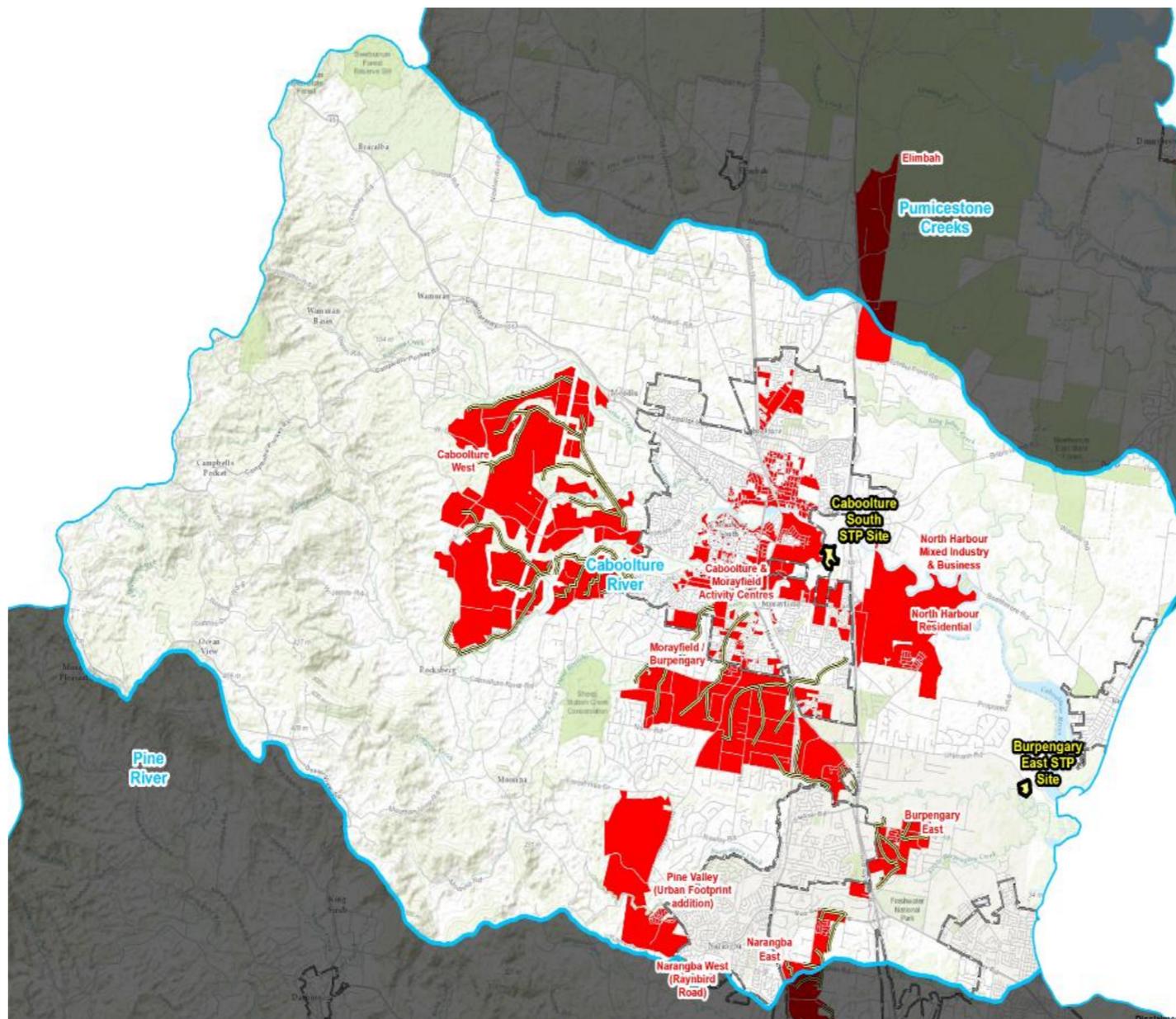
State and local Planning Schemes provide for substantial growth in the catchment

By 2041, the equivalent population in the Caboolture River catchment will increase by almost 120% to approximately
235,500

Unitywater must provide for this growth without causing environmental harm or worsening the condition of the river

Even if their two STPs release high quality effluent to the river, Unitywater needs to adopt other options

Emerging Communities in the Catchment



Emerging Community	Developable Area (ha)	Forecast Demand (EP)
Caboolture West	1,705	84,000
Caboolture & Morayfield Activity Centre	1,957	82,000
Elimbah	407	30,000
North Harbour - Mixed Industry & Business	423	10,000
North Harbour - Residential	164	6,000
Morayfield / Burpengary	946	41,000
Burpengary East	158	8,000
Narangba East	265	18,000
Narangba West	150	9,000
Pine Valley	363	12,000
TOTAL	6,538	300,000

What is the problem with the Caboolture River?

While some reaches may look pristine, the river is overloaded with nutrients and riparian zones are degraded

Estimated load of nitrogen on the river is already ~ 260 kg/d while the estimated assimilative capacity of the river is ~150 kg/d

The river cannot assimilate the existing load of nutrients



What is the solution?

The following multi-phase solution was developed by Unitywater following significant scientific analysis and modelling:

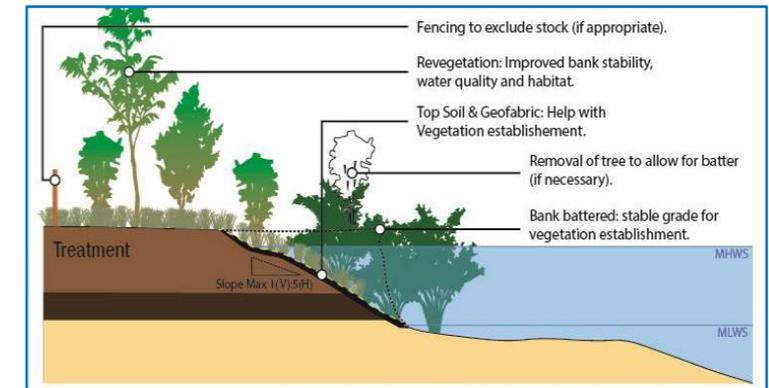
- ❑ upgrade South Caboolture and Burpengary East STPs
- ❑ operate a 2.5 GL/year recycled water irrigation scheme
- ❑ fully utilise all available nutrient offset sites



Upgrade



Recycle



Offset

What is the solution?

The following multi-phase solution will allow:

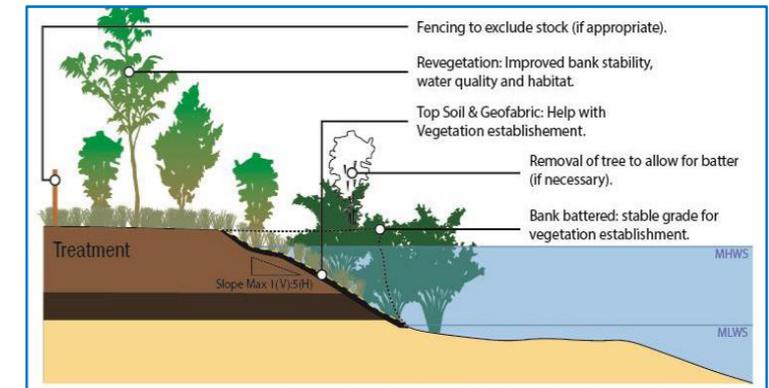
- ❑ concentrations of nutrients in the river to be maintained at 2019 levels up until 2040
- ❑ offset the need for a \$300M ocean outfall which would drive up water bills and be socially and environmentally unacceptable



Upgrade



Recycle



Offset

More about the policy ...

- ❑ concept of nutrient offsetting still in its relative infancy in Queensland
- ❑ allows an STP licence holder to offset emissions targets elsewhere in the catchment
- ❑ provides water utilities the potential to find a more cost effective “green” solution for their nutrient emissions relative to expensive traditional “grey” infrastructure
- ❑ 2014 policy is under review to allow more flexibility and application across Queensland

The environmental outcomes

More about the science ...

- ❑ key to the success of an offsetting scheme is ensuring similar or better environmental outcomes
- ❑ if we repair this part of the river will it have the same benefits as an upgrade?
- ❑ will 5 tonnes from here mean the same as 5 tonnes from there ... or do we need a delivery factor/ratio?



Outcome A

vs



Outcome B

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The environmental outcomes

How can we measure the outcomes ...

1. Modelling of the nutrient reduction from the riparian works
2. Modelling the environmental outcomes in the river from both 1) an upgrade and 2) the offset works
3. Determine the need for a delivery ratio
4. Then monitor, monitor, monitor ...

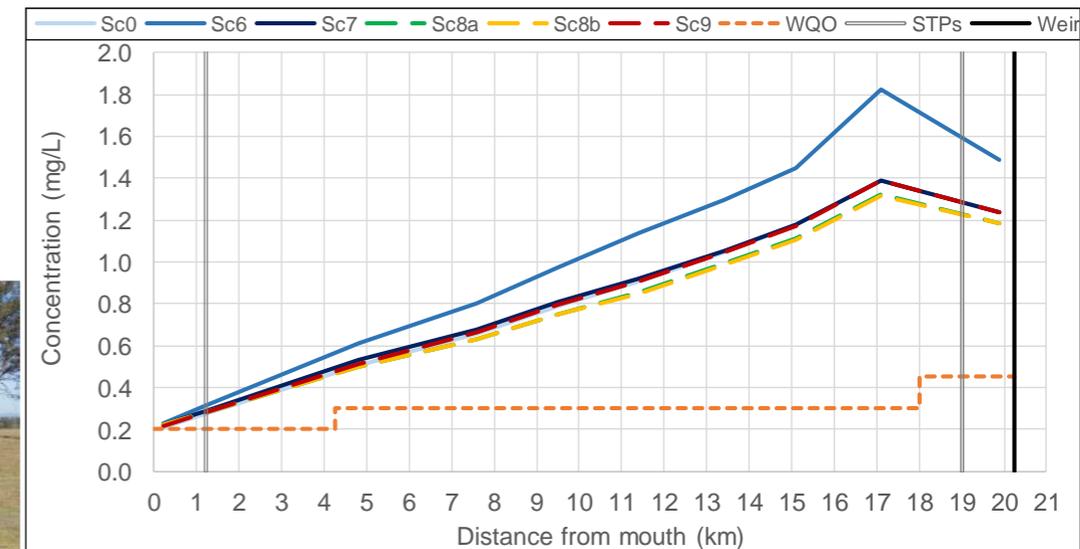


Outcome A

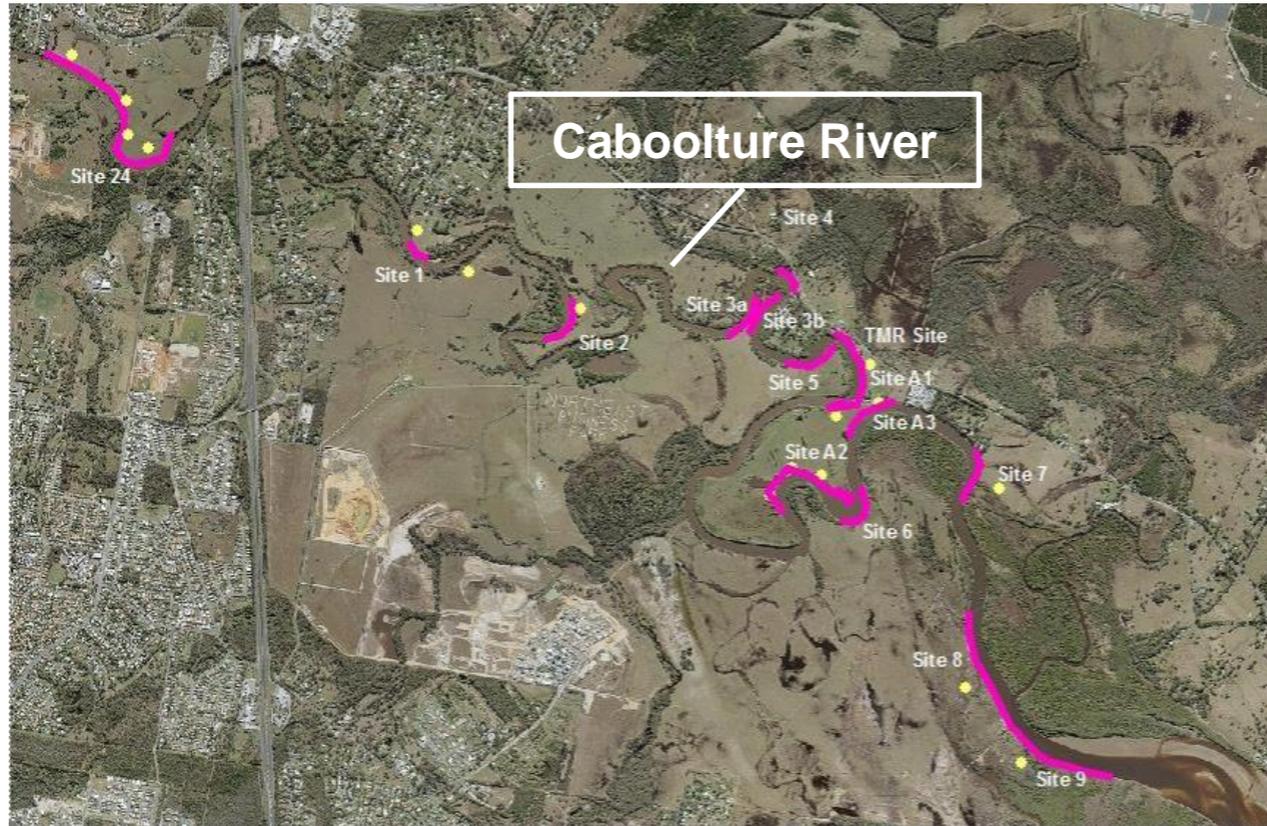
vs



Outcome B



Proposed Nutrient Offset Sites



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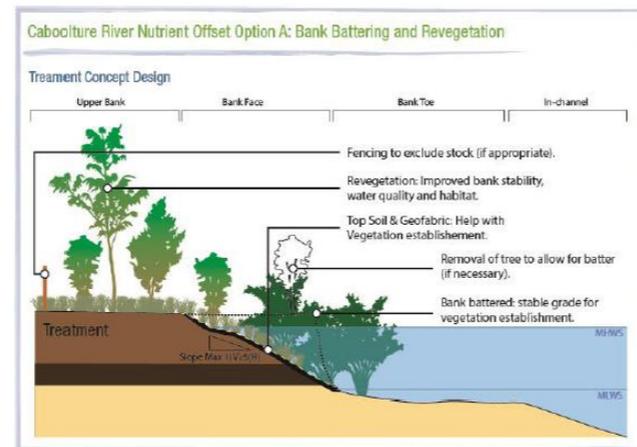


FIGURE 3-1 CONCEPTUAL DESIGN FOR OPTION A: BATTERING AND REVEGETATION



FIGURE 1-5 SITE ONE LOOKING DOWNSTREAM SHOWING ERODED BANK AND LOW VEGETATION DENSITY.



FIGURE 1-6 SITE THREE LOOKING UPSTREAM SHOWING ERODED BANK AND LOW VEGETATION DENSITY.



FIGURE 1-4 SITE TWO LOOKING UPSTREAM SHOWING TYPICAL ERODED BANK PROFILE.

Proposed Nutrient Offset format and size



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What format ...

- ❑ a *Pollution Credit* (i.e. a nutrient management offset) has been included by amendment of Unitywater's Environmental Licence.
- ❑ Unitywater will be able to utilise this *Pollution Credit* once the approved nutrient management works are completed

What size ...

- ❑ Studies indicate between 7 and 8 tonnes per year of nitrogen could be mitigated by the restoration works
- ❑ Translates to a nutrient credit of 4.5 tonnes per year

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Conclusion

What is the result ...

- ❑ Unitywater now has nutrient credits included in its environmental licence
- ❑ It also has a business case to progress the riparian works ... and a mandate to improve the health of the Caboolture River





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