Groundwater Management of Karst Aquifers in South Australia

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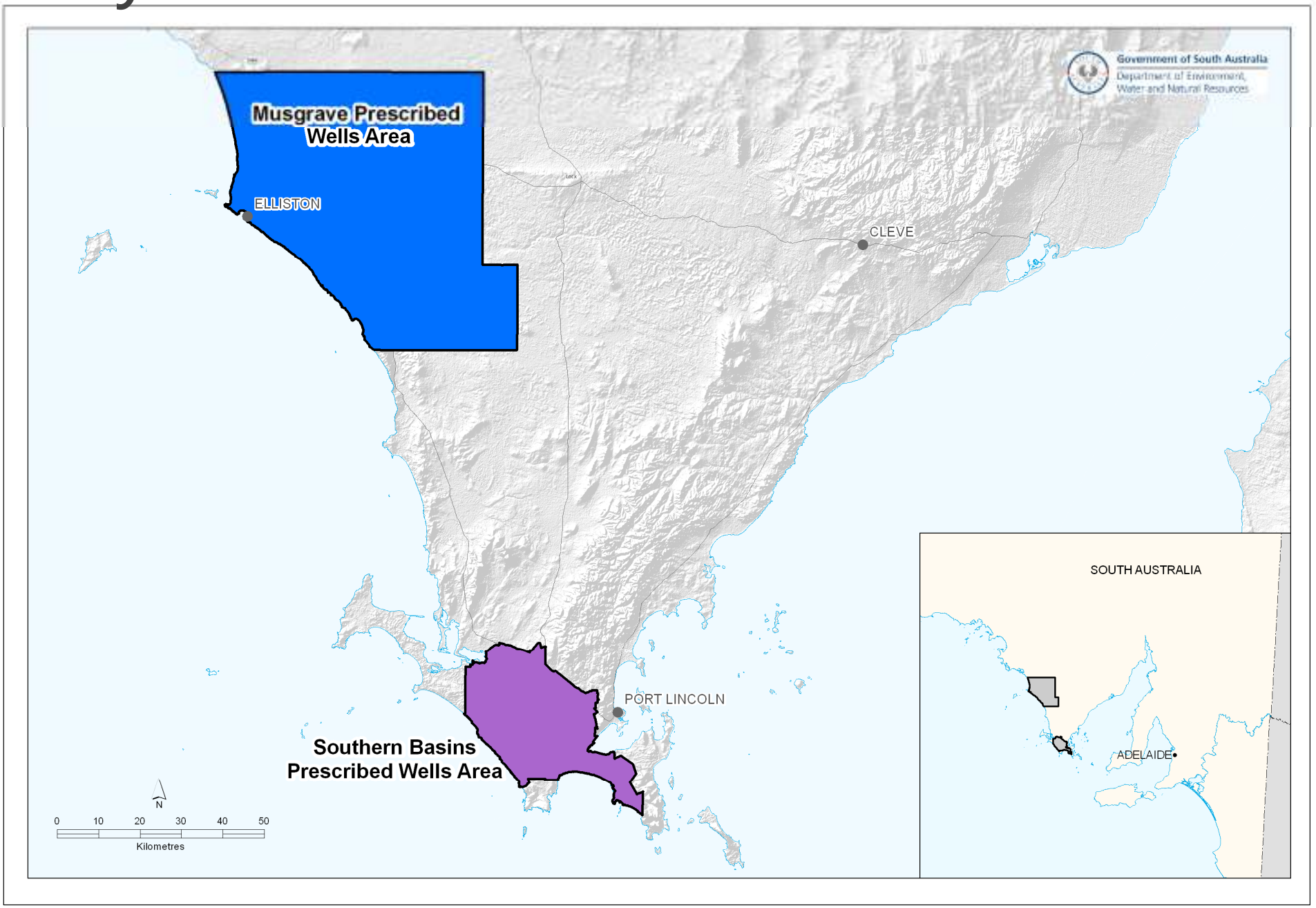
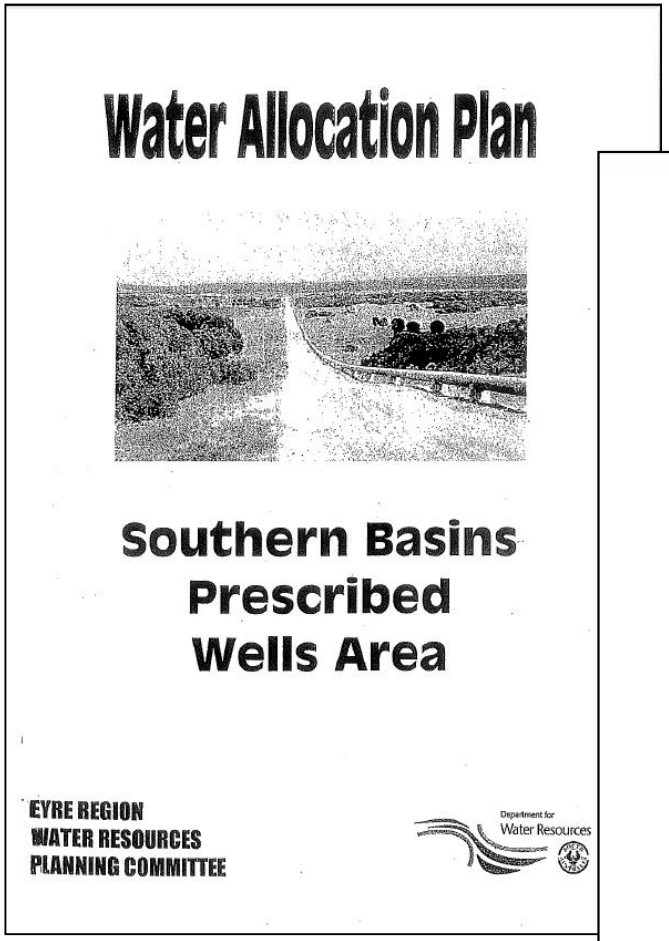
Department of Environment, Water and Natural Resources

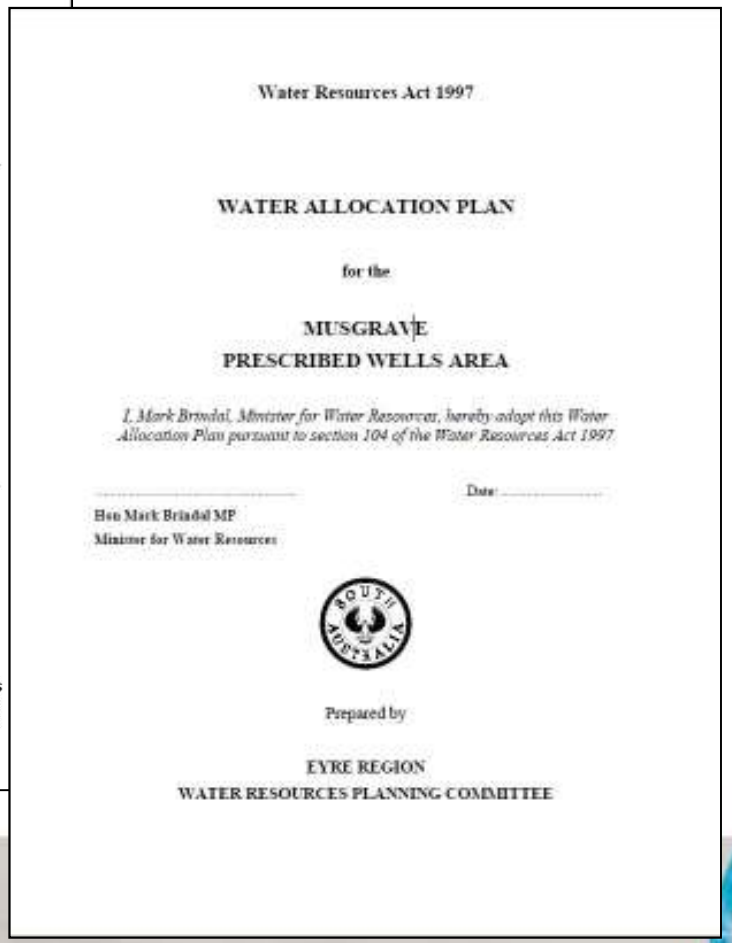
Eyre Peninsula



Background - WAPs



Adopted December 2000



Adopted January 2001

Aquifers

Quaternary Limestone aquifer

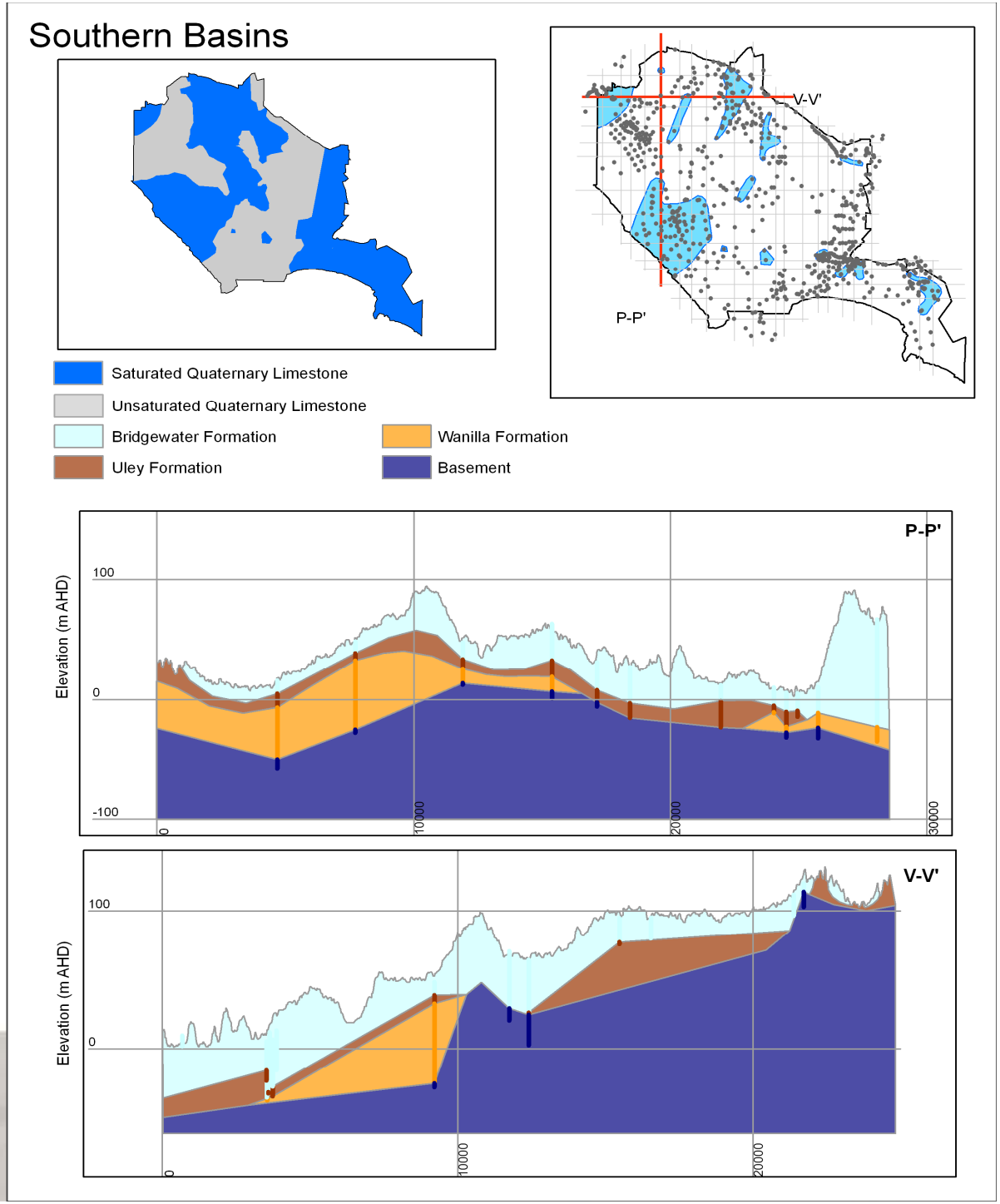
Tertiary Clay aquitard

Tertiary Sand aquifer

Basement aquifer

Quaternary aquifer most utilised

Majority of water sourced from discrete freshwater lenses



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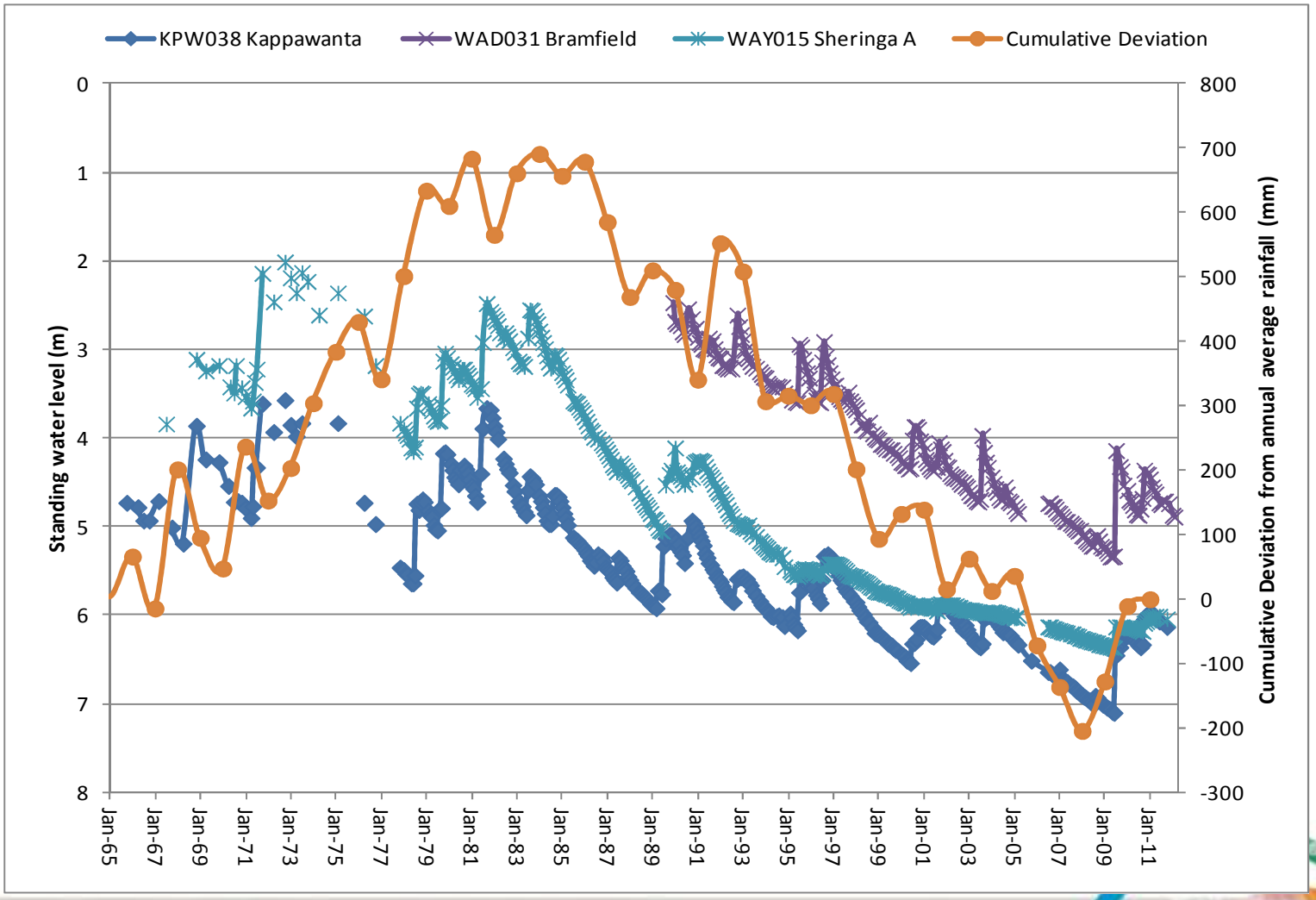
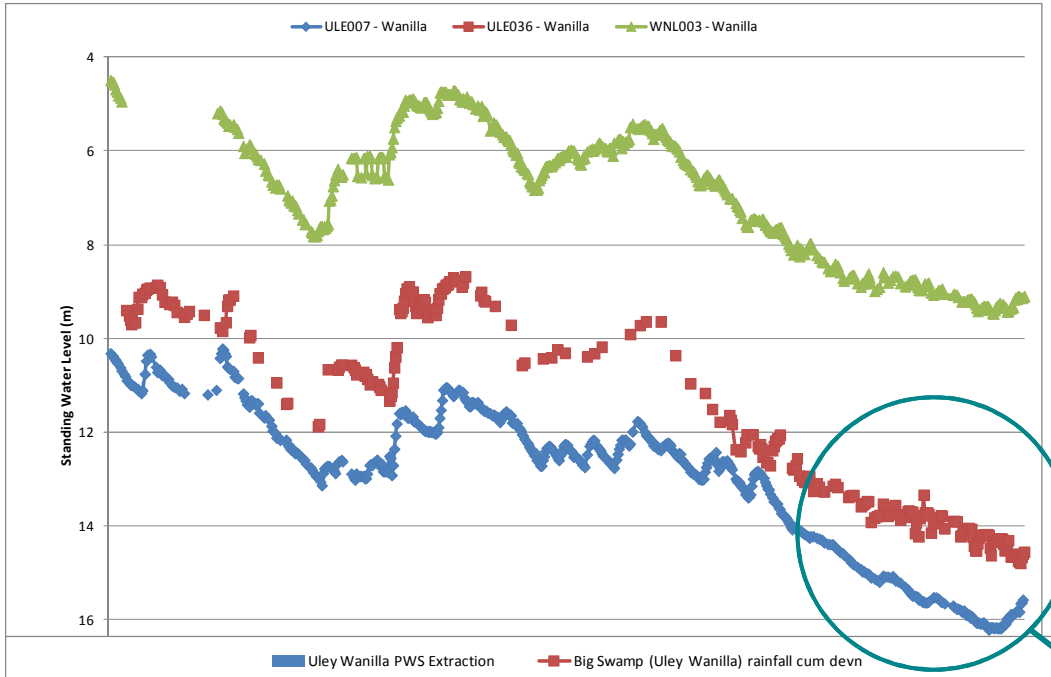
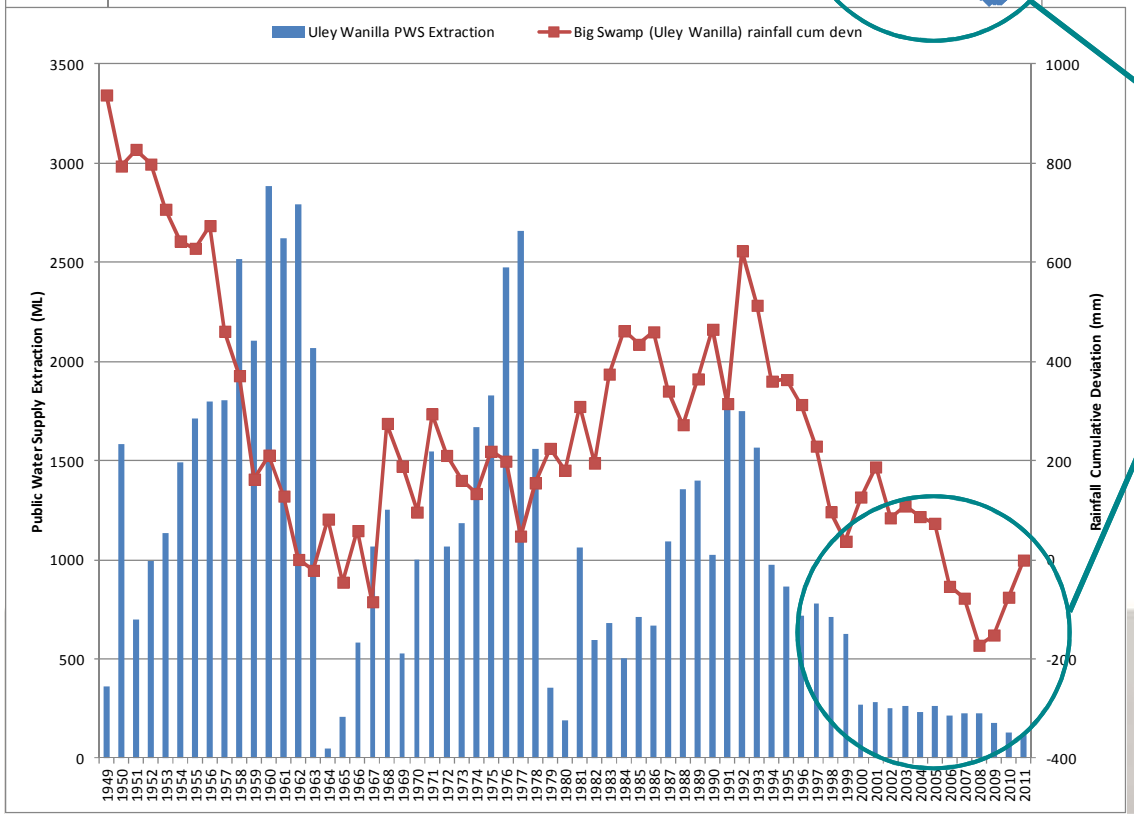
Why adaptive management?







Despite stable extraction levels, water levels strongly reflect the rainfall trends

Modelling

- Arc Hydro groundwater was used to delineate aquifer geometries (Video)

Variance of annual allocations

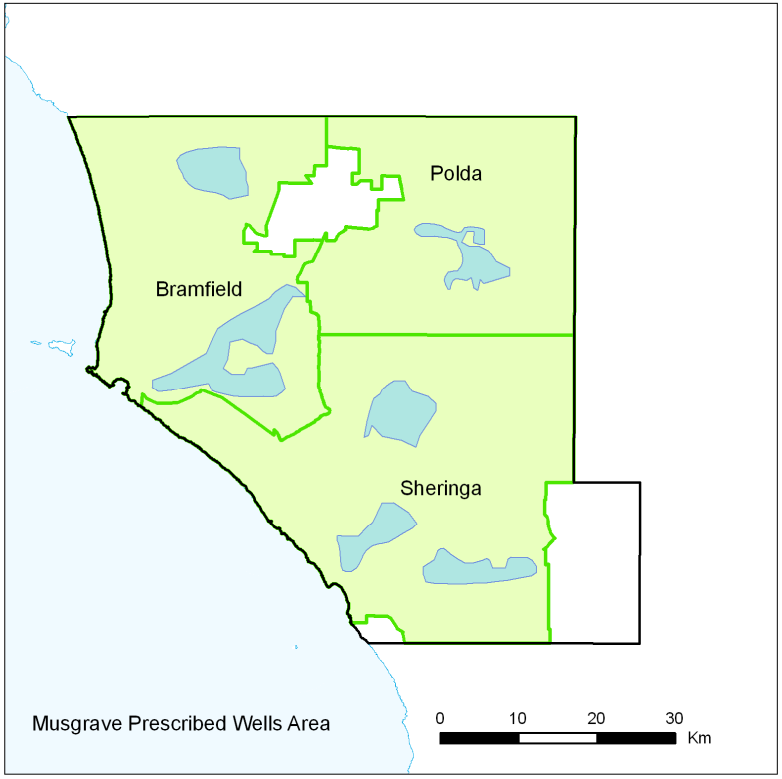
It is proposed that allocations will be varied annually dependent on the level of storage of the resource in reference to a baseline

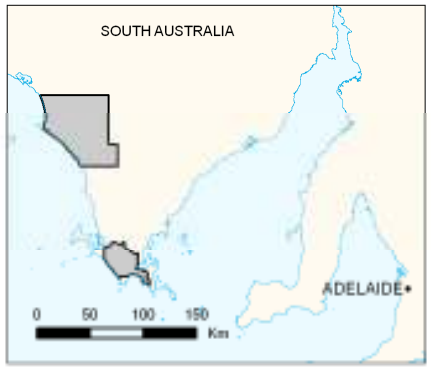
Baseline April 1993 – recent climate, highest water level in past 20 years, April is lowest water level of the year, conservative approach

Proposed Triggers

The proportional relationship, which is the mechanism by which the allocations are varied based on the current years aquifer storage level, has set triggers that control:

- When the allocations start to change from the entitlement known as the **Upper Storage Trigger**
- When the rate of change between the storage level and the portion of water available for allocation changes known as the **Mid Storage Trigger**
- When allocations cease known as the **Lower Storage Trigger**





Legend

- Prescribed Wells Area
- Fresh Groundwater Lens
- Resource

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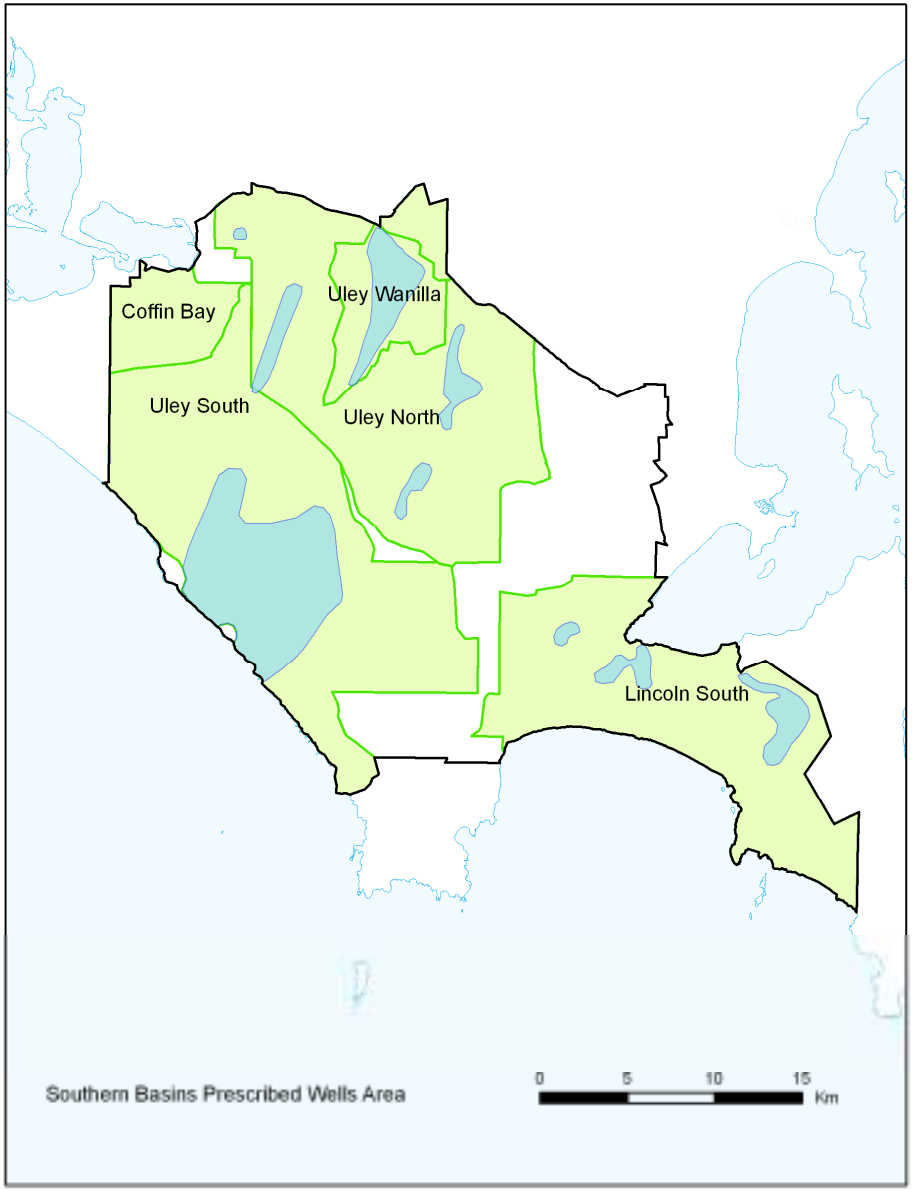
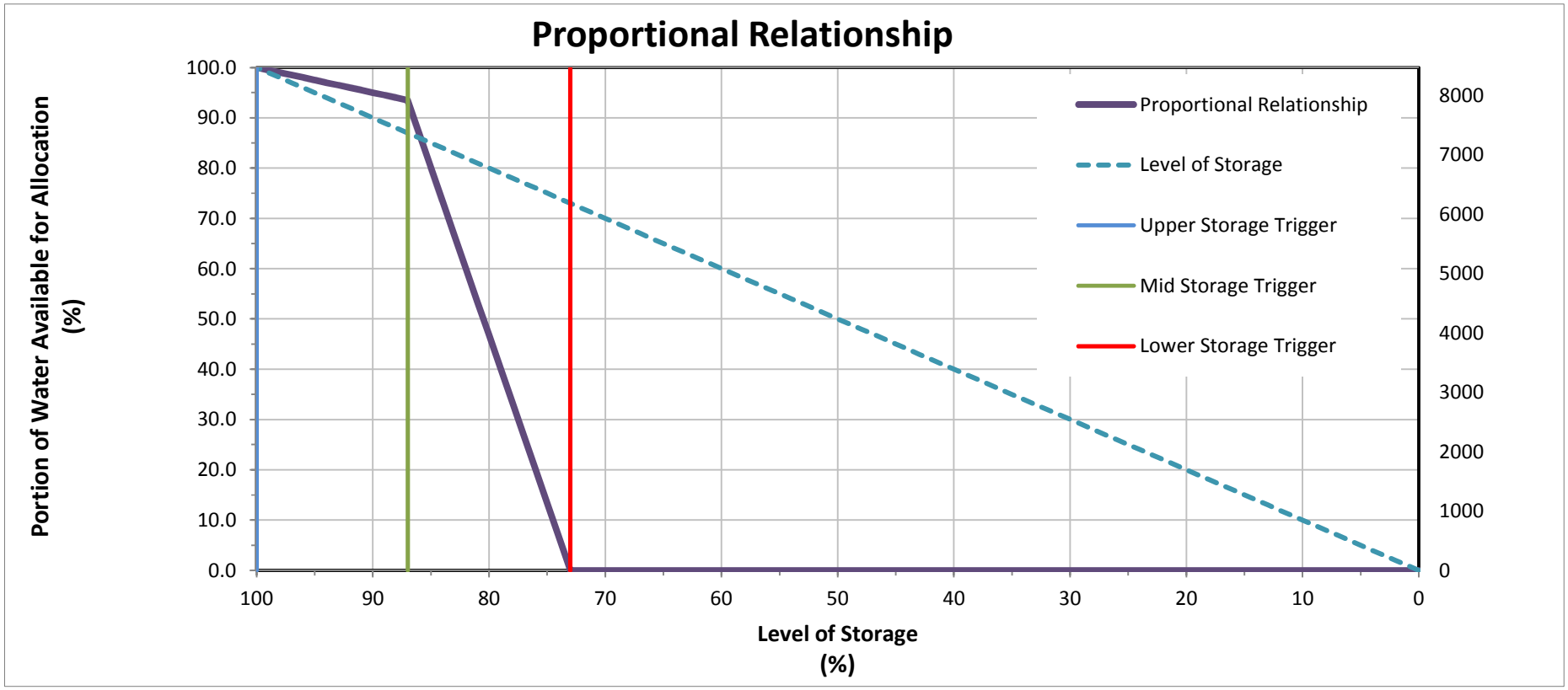


Triggers

Consumptive Pool	Upper Storage Trigger %	Upper Rate of Change	Mid Storage Trigger %	Lower Rate of Change	Lower Storage Trigger %
Southern Basins PWA					
Coffin Bay	95	1.0	94	49.5	92
Uley Wanilla PWS	85	1.0	78	11.62	70
Uley North	90	0.5	86	24.5	82
Uley South PWS	90	1.0	81	9.1	71
Lincoln South PWS	95	1.0	94	99	93
Musgrave PWA					
Polda	100	1.0	99.5	199	99
Bramfield	90	1.0	81	10.11	72
Sheringa	100	0.5	87	6.68	73

Sheringa


Proportional Relationship
Portion of Water Available for Allocation (%)
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
8000
7000
6000
5000
4000
3000
2000
1000
0
100
90
80
70
60
50
40
30
20
10
0
Level of Storage (%)
Proportional Relationship
Level of Storage
Upper Storage Trigger
Mid Storage Trigger
Lower Storage Trigger

Example

Example 1:

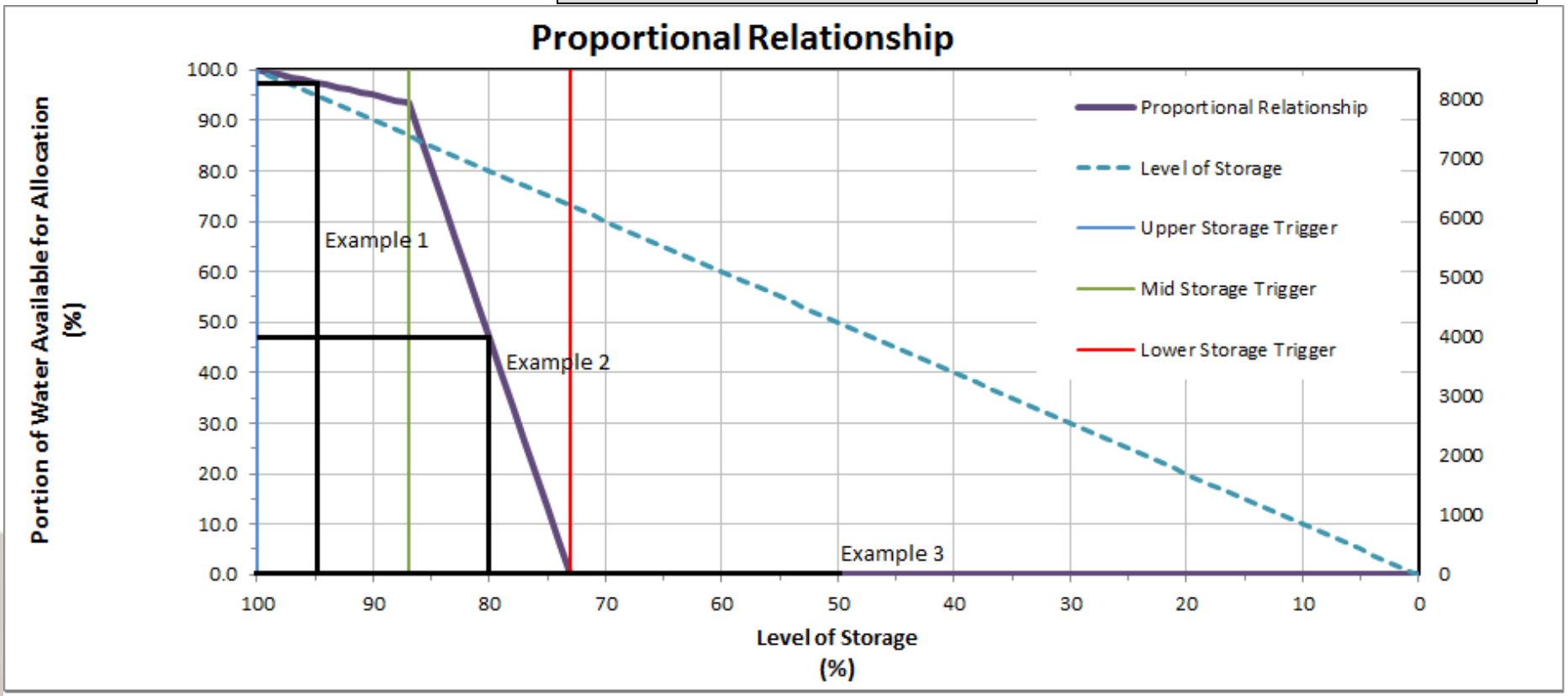
Level of Storage:	*95%*
Volume of water available for allocation:	*97.5%*
Allocation:	***0.975 kilolitres/share***

Example 2:

Level of Storage:	*80%*
Volume of water available for allocation:	*47%*
Allocation:	***0.47 kilolitres/share***

Example 3:

Level of Storage:	*50%*
Volume of water available for allocation:	*0%*
Allocation:	***0 kilolitres/share***



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