



# Water Monitoring Framework

Water Monitoring Strategy for Coal Basins in  
NSW

Southern Coalfield – AGL Camden CCC  
20 September 2017

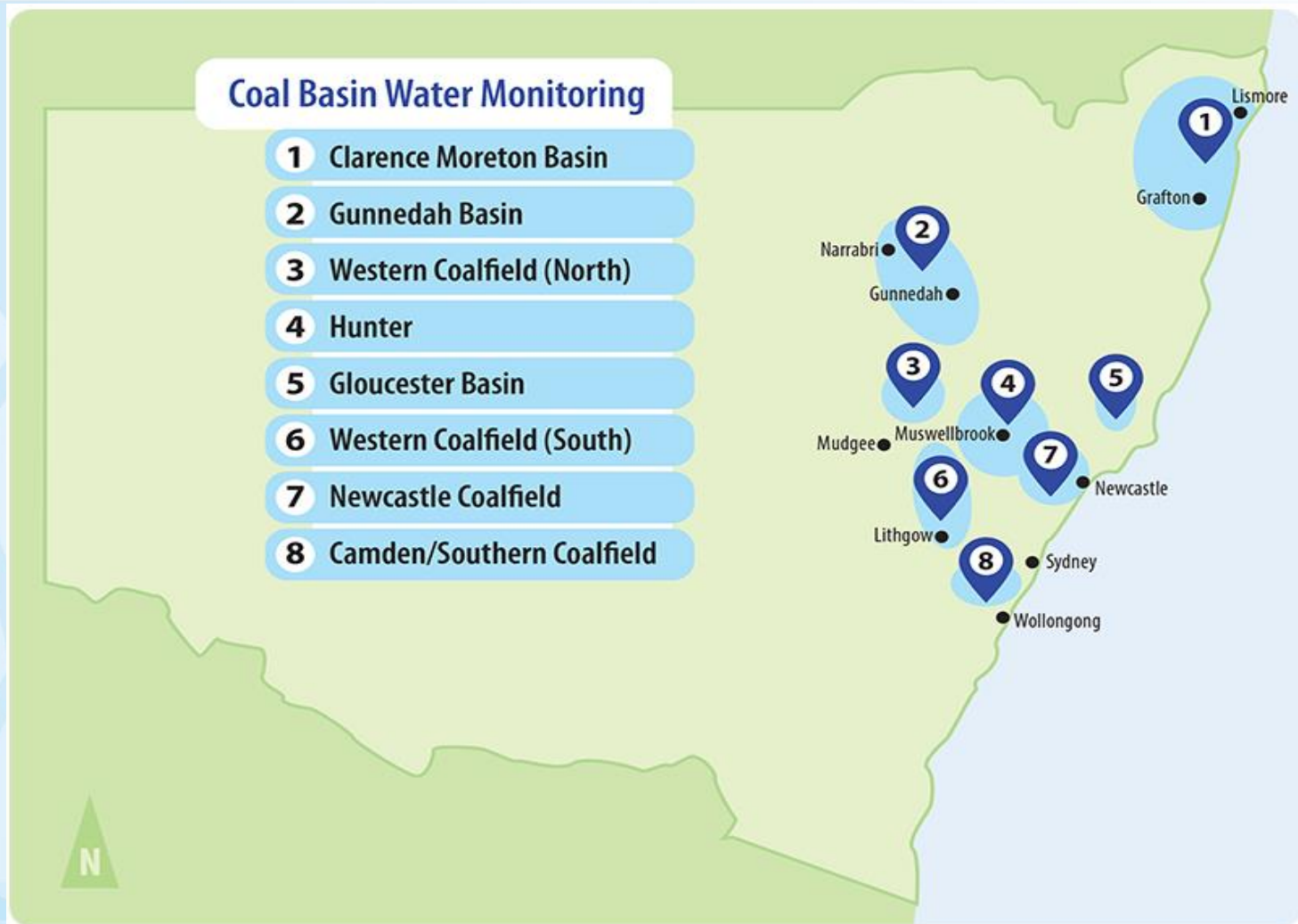
# Background

- NSW Cabinet Decision – June 2014
- NSW Chief Scientist & Engineer Reports – September 2014
- NSW Gas Plan – election commitment - March 2015
- Water Monitoring Strategy for Coal Basins in NSW – May 2015
- Business Case – December 2015

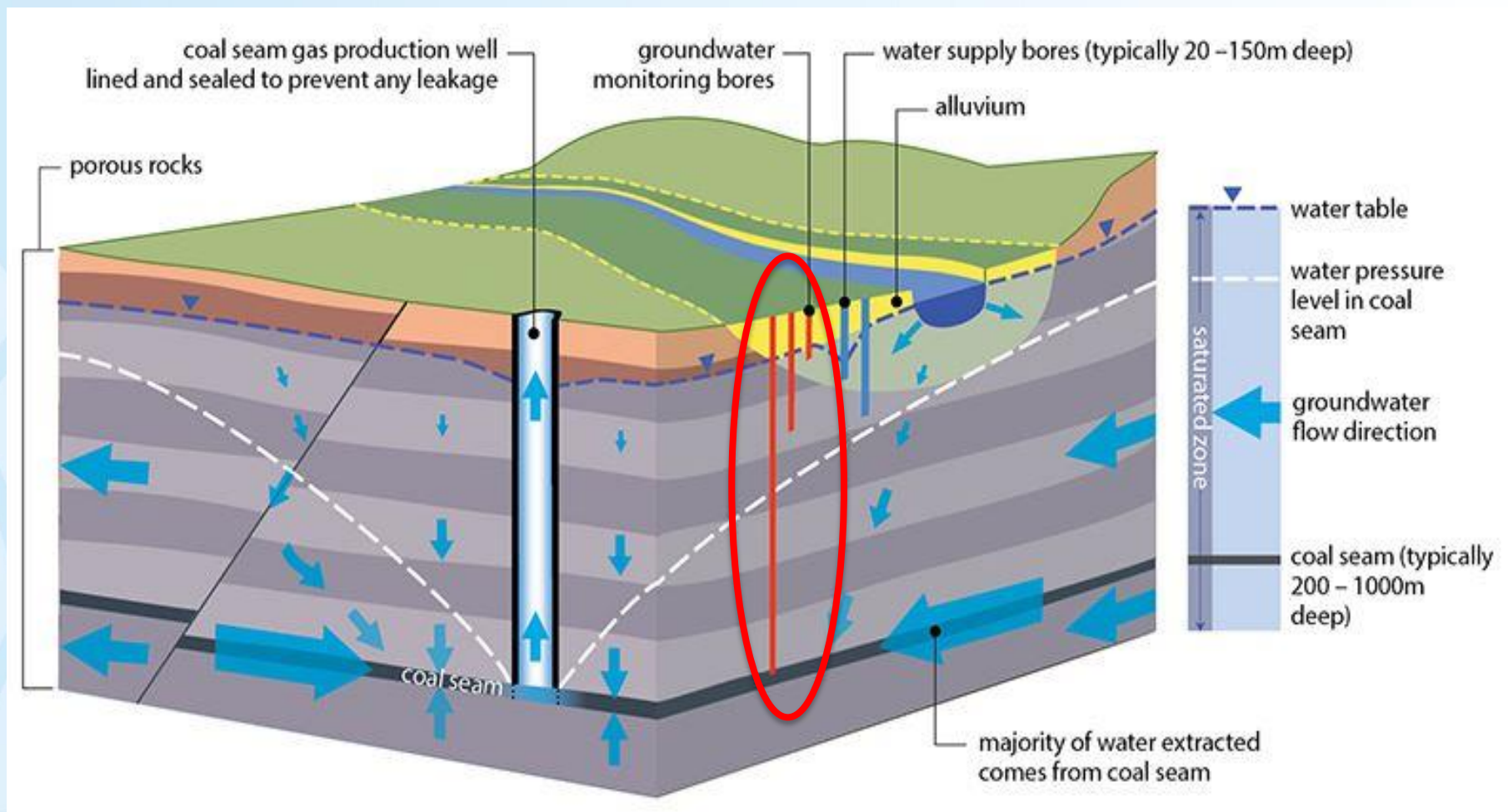
# Water Monitoring Strategy for Coal Basins in NSW (DPI Water's Action Plan)

- Infrastructure - new bores in deeper strata
- Expanded monitoring program – new and existing infrastructure
- Harness industry and other agency water data
- Information & Knowledge products out to the community

# Water Monitoring Strategy for Coal Basins in NSW – 8 Priority Areas



# Water Monitoring Strategy for Coal Basins in NSW

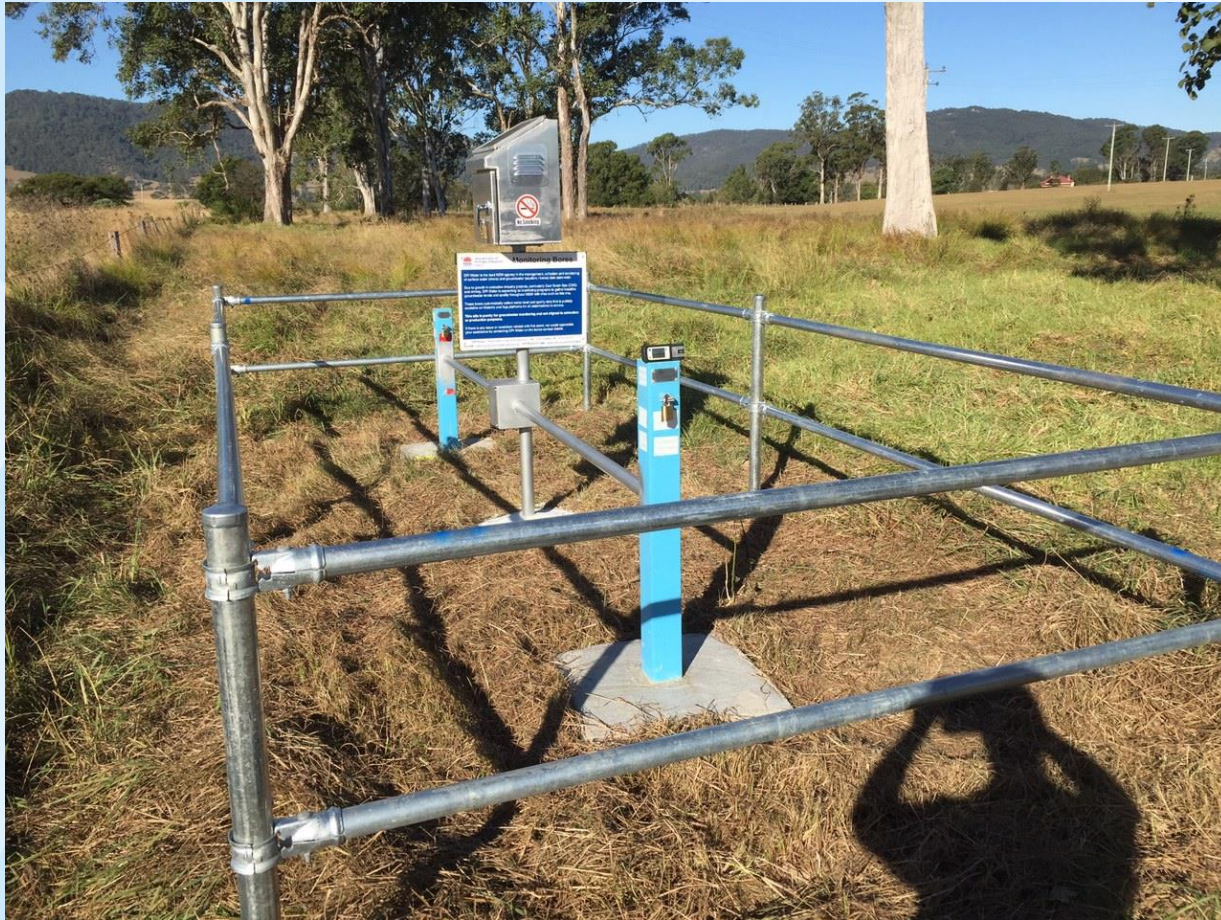


# Monitoring Purpose

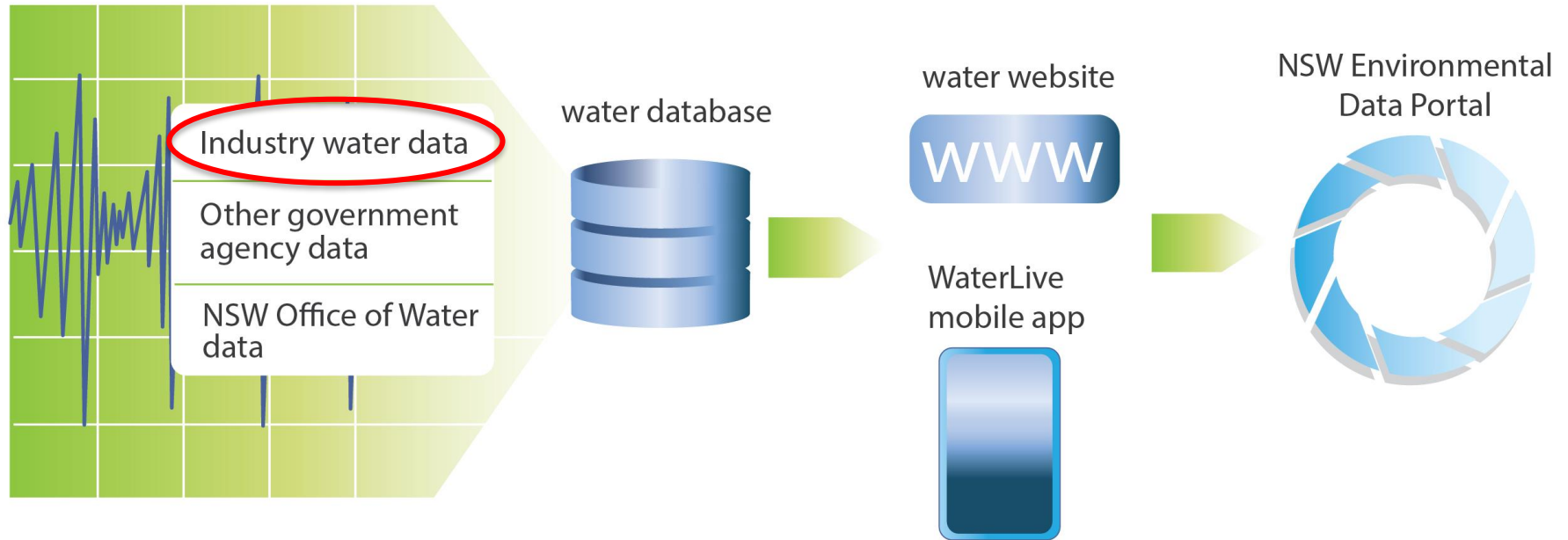
To establish ***reference condition***\* water quality and quantity and to observe changes.

\*An alternative expression is ***baseline***. Here reference condition means the condition found upon its initial observation.

# Expanded Monitoring



# Water Information Management





# Monitoring Results – Data, Information



Department of  
Primary Industries  
Office of Water

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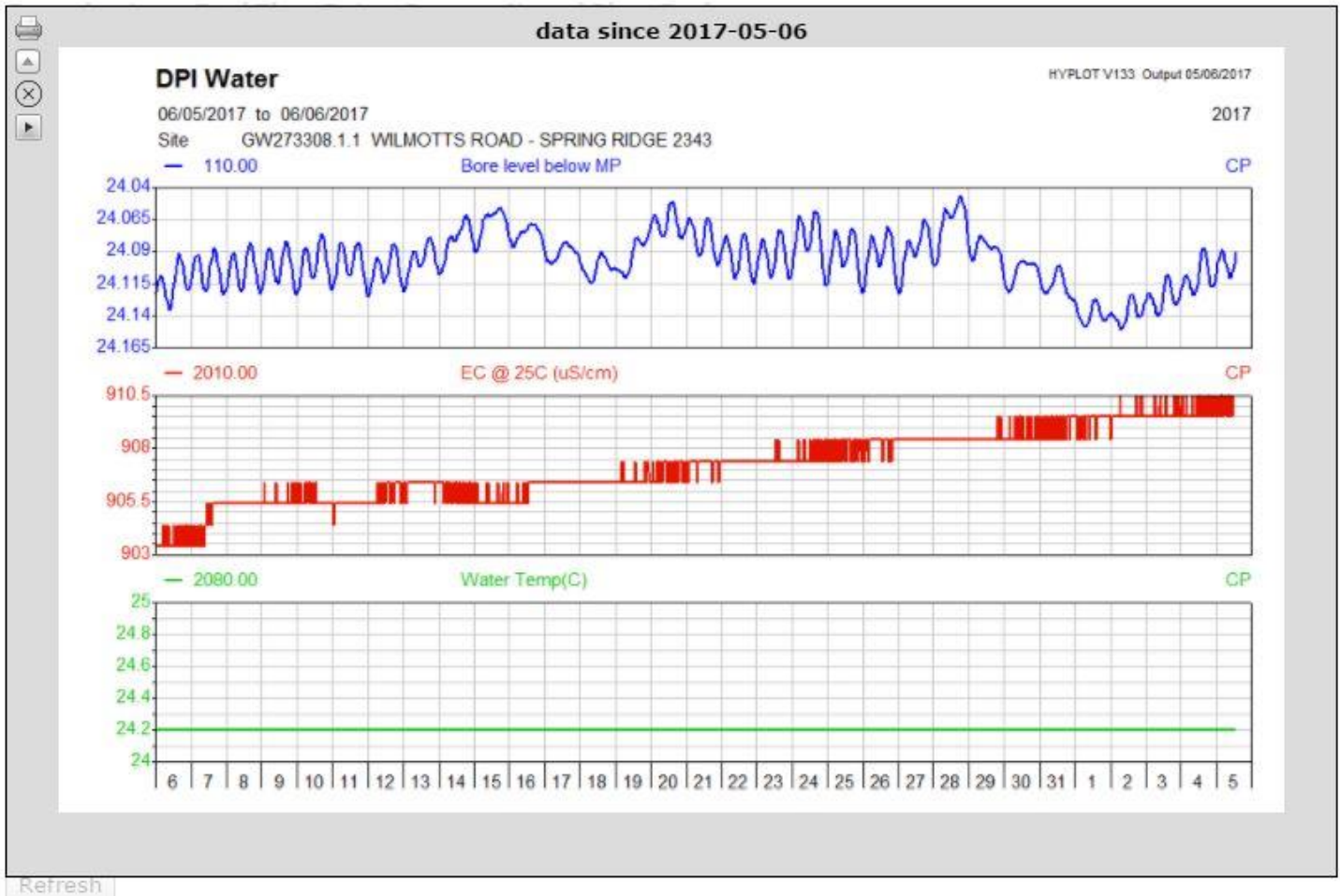
Water Management

Water Licensing

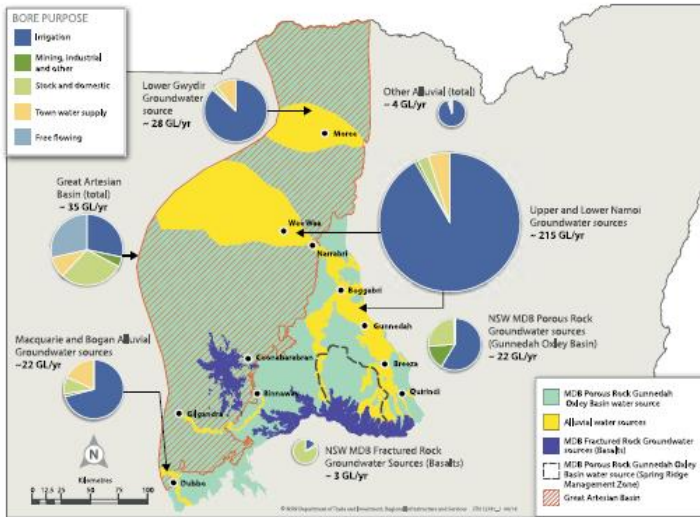
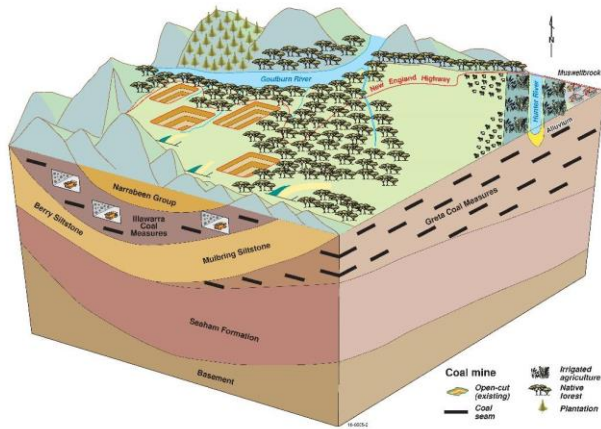
Urban Water

Real-time data

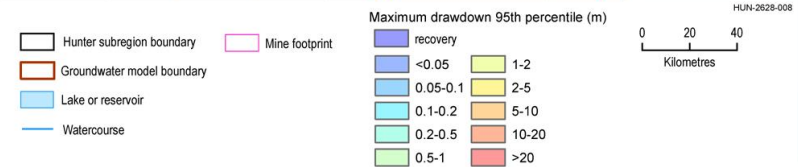
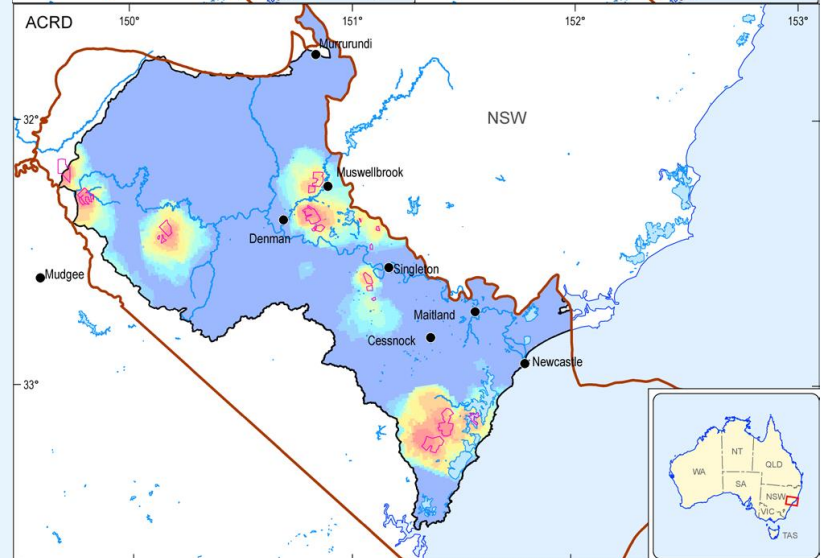
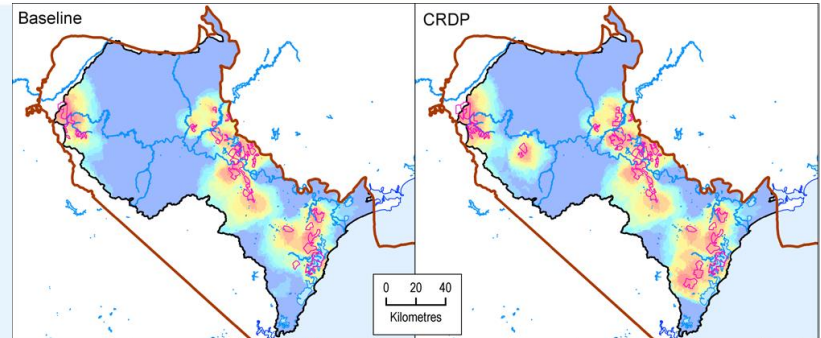
- GW025045.3.2 Gw..
- GW025245.1.1 Gw..
- GW025245.3.3 Gw..
- GW025299.1.2 Gw..
- GW025333.5.4 Gw..
- GW025340.2.2 Gw..
- GW030000.1.1 Bu...
- GW030029.2.2 Co...
- GW030070.4.4 Gw..
- GW030083.2.2 Gw..
- GW030087.2.2 Gw..
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- GW030344.1.1 Gw..
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- GW030344.3.3 Gw..
- GW030450.1.1 Gw..
- GW030450.1.3 Gw..
- GW030468.1.1 Na..
- GW036005.1.1 Gw..
- GW036005.1.2 Gw..
- GW036045.1.1 Gw..
- GW036045.3.3 Gw..



# Information Products, Analysis



Gunnedah Basin: Distribution and purpose of groundwater rights



Water Monitoring Strategy – Southern Coalfield

# Southern Coalfield

## Issues:

- AGL's Camden gasfield
- Thirlmere Lakes – Tahmoor
- Sydney drinking catchments – underground coal mining
- Southern Highlands – Hume Coal



# Site Selection Criteria

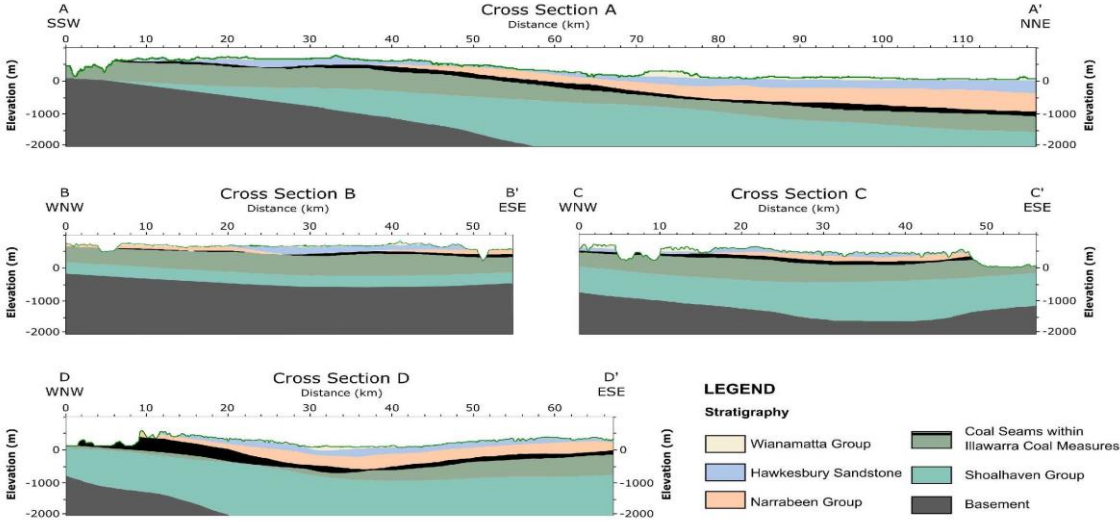
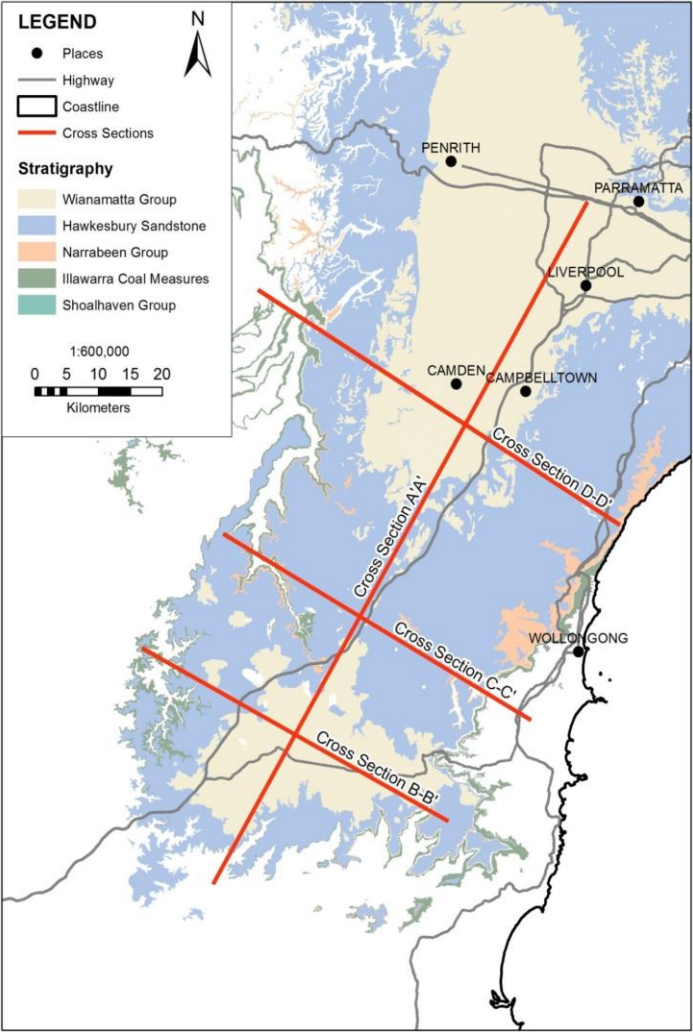
- Identifies or confirms the characteristics of strata, aquifers and aquitards
- Fills data gaps
- Complements existing monitoring
- Impacts, pathways and receptors
- Control
- Numerical modelling
- Addresses stakeholder concerns
- Logistics

# Geological Model

- Division of Resources and Geoscience
- 3D geological model
- Target Formations depths:
  - Hawkesbury Sandstone
  - Bald Hill Claystone
  - Bulgo Sandstone or Scarborough Sandstone
- Determine drilling meterage
- Prioritise budget

Hawkesbury Sandstone		Up to 120		
Narrabeen Group	Newport Formation	10		
	Carie Formation	3		
	Bald Hill Claystone	12		
	Bulgo Sandstone	95		
	Stanwell Park Claystone	20		
	Scarborough Sandstone	30		
	Wombarra Shale	25		
	Coalcliff Sandstone	15		
Illawarra Coal Measures	Eckersley Formation	BULLI COAL	1.5	
		Unnamed Member	10	
		Balgownie Coal Member	1	
		Lawrence Sandstone Member	9	
		Cape Horn Coal Member	0.3	
		Unnamed Member	1	
		Hargrave Coal Member	0.1	
		Unnamed Member	3	
	Allan's Creek Formation	WONGAWILLI COAL	9.4	
		KEMBLA SANDSTONE	14	
		American Creek Coal Member	3	
		Unnamed Member	27	
		TONGARRA COAL	Upper Split	2
			Lower Split	0.5
		Wilton Formation	Unnamed Member	15
			Woonona Coal Member	4
			Unnamed Members	
			ERINS VALE FORMATION	26
			PHEASANTS NEST FORMATION	
			Figtree Coal Member	0.5
Unnamed Member	20			
Unanderra Coal Member	2			
Unnamed Member	>84			

# Geological Model



# Program Schedule

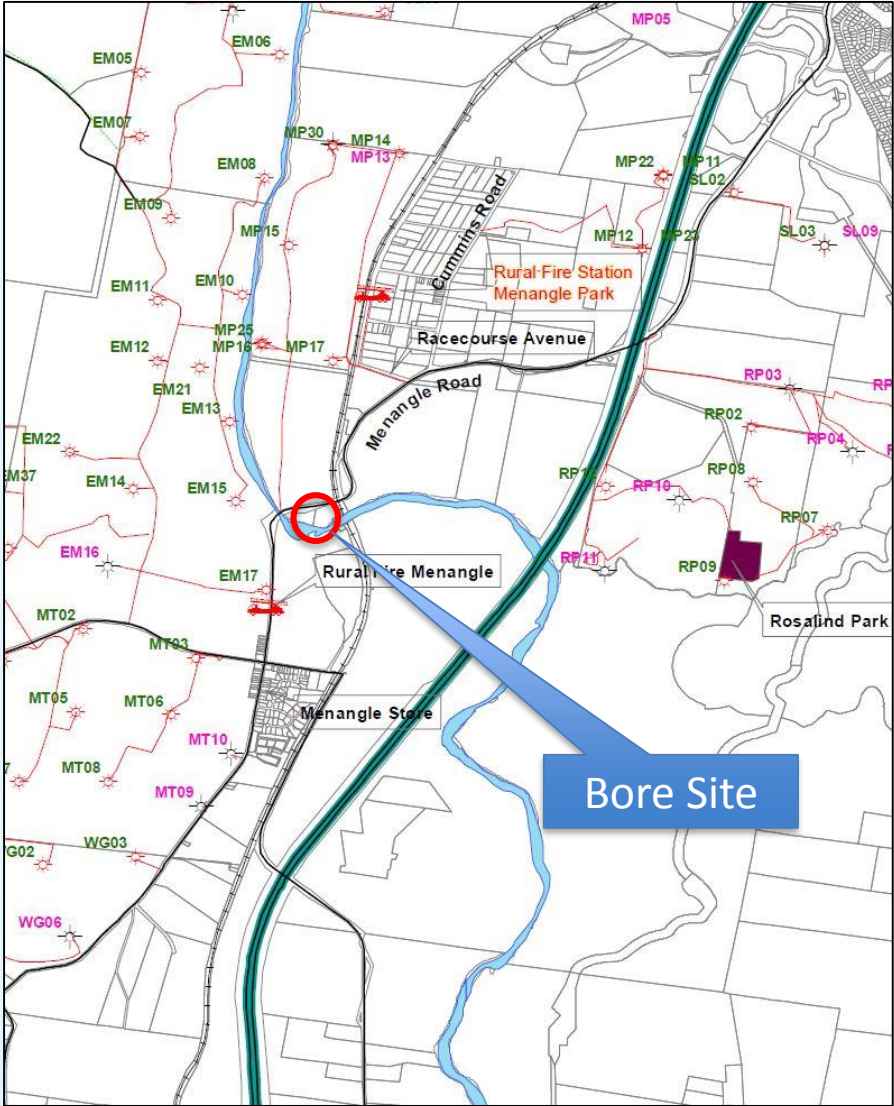
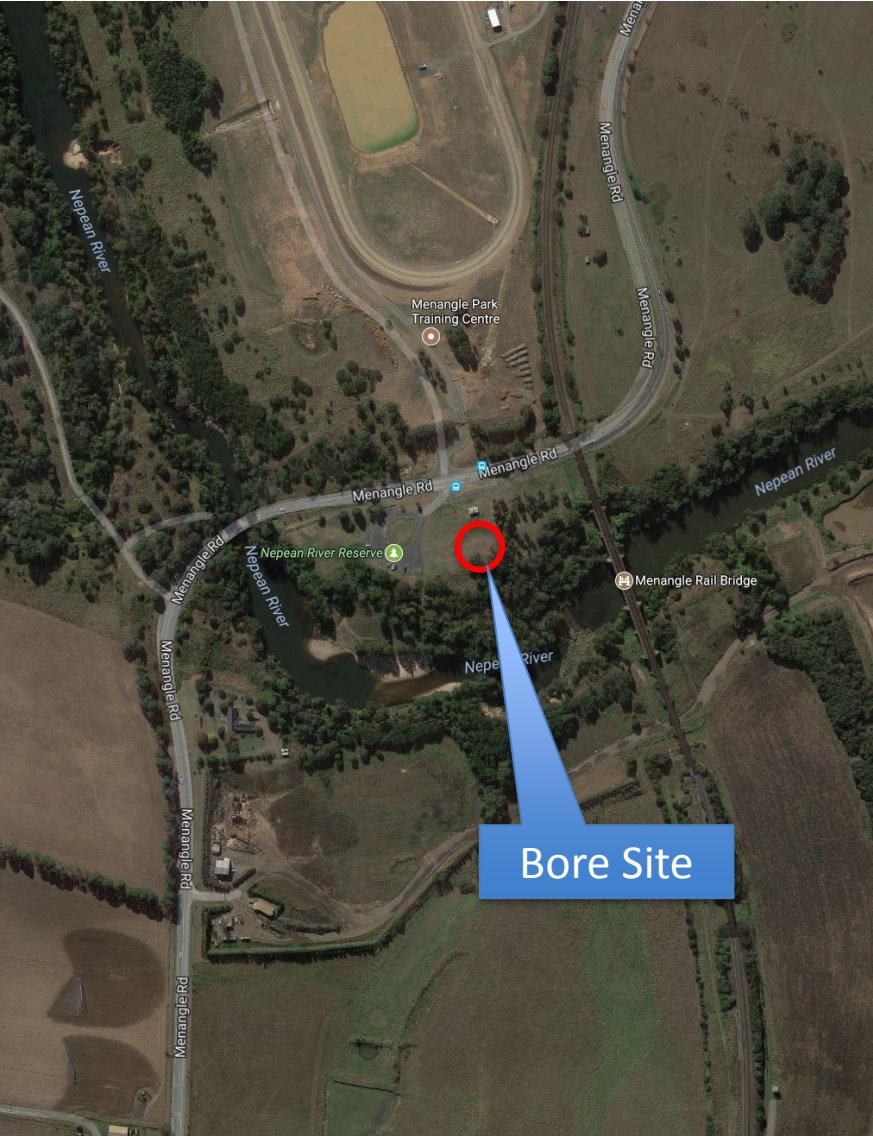
	MONTH						
Task	June-17	July-17	Aug-17	Sept-17	Oct-17	Nov-17	Dec-17
Approvals							
Procurement of contractors for bore construction							
Drilling and bore construction							
Installation of monitoring equipment and telemetry							
Monitoring commences							

# Stakeholder Engagement

- Briefings to CCC & local government
- Letters – local government and MPs
- Letters to neighbouring landholders
- Market sounding for information products
- Web-site: [www.water.nsw.gov.au](http://www.water.nsw.gov.au)



# Menangle Road Site



# Menangle Road Site



Looking east  
toward railway  
viaduct

Three new bores:

- Hawkesbury Sandstone (170 m)
- Bulgo Sandstone (250 m)
- Scarborough Sandstone (530 m)

# More information

Visit: [www.water.nsw.gov.au](http://www.water.nsw.gov.au)

Contact:

Rob Brownbill, Lead Hydrogeologist  
02 6024 8834

Any questions?

The screenshot shows the website for the Department of Primary Industries Water. The page title is "Water Monitoring Framework". It features a navigation menu on the left with categories like "Water management", "Water resource plans", "Law and policy", "Water sharing plans", "Floodplain management plans", "Groundwater", "Water and coal seam gas", "Water Monitoring Framework", "NSW Groundwater Baseline Project", "Gunnedah Basin update feb 2017", "Southern Coalfield Fact Sheet August 2017", "Werris Creek groundwater review", "Trading arrangements in Hunter and Gloucester basins", "Fees and charges", "Monitoring", "Modelling", "Ecology", "Water quality", "Water recovery", "Basins and catchments", "Water NSW Amendment Bill", and "NSW Water Availability".

The main content area is titled "Water Monitoring Framework" and includes a sub-section "Water Monitoring Strategy for Coal Basins in NSW". Below this is a map titled "Coal basin water monitoring locations" showing eight numbered locations: 1. Clarence Moreton Basin, 2. Gunnedah Basin, 3. Western Coalfield (North), 4. Hunter, 5. Gloucester Basin, 6. Western Coalfield (South), 7. Newcastle Coalfield, and 8. Camden/Southern Coalfield. The map also shows major cities like Sydney, Newcastle, and Wollongong.

The "Background" section explains that the Water Monitoring Strategy for Coal Basins in NSW has been developed to improve DPI Water's understanding of groundwater behaviour in the NSW coal-bearing geological basins. The strategy aims to collect monitoring data for groundwater and surface water in coal basins, and to understand the potential effects of extractive industries on water resources in these locations. As part of the strategy, DPI Water is expanding the existing network of water monitoring infrastructure. This initiative will improve DPI Water's knowledge of groundwater behaviour across NSW's coal basins through the provision of better mapping, monitoring and management. When complete, the data from the water monitoring sites will be shared with the community, government and industry, delivering a long-term benefit for multiple data users. A total of \$22.8 million has been allocated by the NSW Government to deliver the strategy, which is expected to be completed by 2020. Work has commenced in the Gunnedah Basin, with work due to commence at Camden/Southern Coalfield and Hunter regions in the coming months.

The "Why expand the network of water monitoring locations?" section states that over time, NSW has established a network of over 4000 monitoring bores at more than 3000 locations across the state. These bores were built to collect information in areas of large-scale water use, traditionally irrigation. There is a need for the current network to be expanded into the coal basins. Expanding water monitoring points means improving the accuracy in measuring and monitoring in NSW coal basins. Collecting baseline data allows DPI Water to closely and accurately monitor change in water quality and quantity over time.