Farm Water Management Planning

Small-scale Water Sampling project

NSW GOVERNMENT Local Land Services

Australian Government
Department of Agriculture, Fisheries and Forestry

Future Drought Fund

SOUTHERN NSW Innovation Hub
SUSTAINABLE AGRICULTURE, LANDSCAPES AND COMMUNITIES

Farm Water Management Planning

This project is supported by Southern NSW Innovation Hub, through funding from the Australian Government's Future Drought Fund

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Why?

- Specifically looking at ground-tanks
- Primary source of water – irrigation channels
- Identify:
  - ‘point-in-time’ water quality
  - potential water quality issues
- Potential animal health/production issues?

What did we do?

- 5 ground-tanks
- 1 drain
- 3 channel sites
- Identified recent history of each site
- Sample protocols as per project
- Samples analyzed at Waterview lab

Sampling regime

- Chloride
- Total N
  - Nitrate and nitrite
- Total coliforms
- E. coli
- Temp.
- Thermotolerant coliforms
- Total P
- Total Algae
- BGA

Ground-tank 1

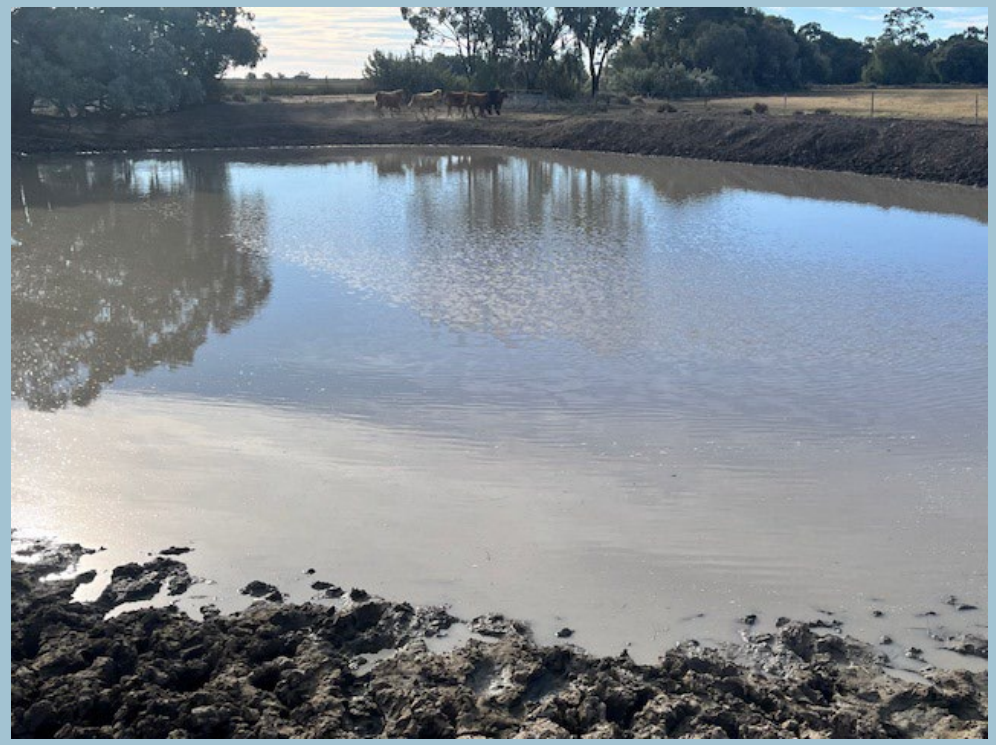
- Type: Excavated ground-tank
- Water source: Direct from farm channel and/or MIL channel
- Runoff: Berm – no runoff from surrounds
- Recent history:
  - Not used for approx. 2 months
  - Not filled since December 2024
- Livestock type: Cattle
- Activity: Grazing irrigated (annual) pastures
- Smell: Nil

Ground-tank 2

- Type: Excavated ground-tank
- Water source: Direct from farm channel and/or MIL channel – runs along toe furrow, and irrigation drainage
- Runoff: Berm – no runoff from surrounds
- Recent history:
  - Not used for approx. 3 weeks
  - Filled since February, 2025
- Livestock type: Cattle
- Activity: Grazing native perennial pastures and high quality hay
- Smell: earthy

Ground-tank 3

- Type: Excavated ground-tank, recently desilted and surface area reduced
- Water source: Irrigation drainage
- Runoff: irrigation and rainfall from paddock
- Recent history:
  - In use
  - Filled since March, 2025
- Livestock type: Cattle
- Activity: Grazing high quality irrigated pastures
- Smell: Nil



Ground-tank 4

- Type: Excavated ground-tank
- Water source: Farm channel and/or MIL channel
- Runoff: Berm – no runoff from surrounds
- Recent history:
  - In use
  - Filled February, 2025
  - Higher seepage losses
- Livestock type: Cattle
- Activity: Grazing irrigated sorghum
- Smell: earthy, carp visible in water

Ground-tank 5

- Type: Excavated ground-tank
- Water source: Localised runoff and/or MIL channel
- Runoff: runoff from surrounds
- Recent history:
  - In use
  - Filled November, 2024
- Livestock type: Sheep
- Activity: Stubbles
- Smell: Nil

Drainage channel

- Type: Excavated drain
- Water source: Localised rainfall runoff and/or irrigation runoff
- Runoff: runoff from irrigated paddocks
- Recent history:
  - Fenced (no livestock access)
  - Filled March 2025
- Livestock type: Nil
- Activity: Runoff from irrigation which can be used to fill tanks and for irrigation
- Smell: Nil

Water source - channels

- Sampled on same day as ground-tanks
- Water samples taken from within main water flow
- 3 sites sampled:
  - immediately u/s ground-tank sites at offtake point
  - offtake of the main channel from the Mulwala Canal
  - Mulwala Canal offtake @ Mulwala

Sampling results

		Site									Draft (2023)
Parameter	Units	GT1	GT2	GT3	GT4	GT5	Drain	Ch1	Ch2	Mulwala	ANZECC
Cl	mg/L	48	42	23	34	30	17	3	3	3	< 1,000
Total N	mg/L	4	8	12	14	3	3	<0.4	<0.4	<0.4	
Nitrate + Nitrite	mg/L	<0.01	0.02	0.02	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	< 10
Total P	mg/L	0.4	0.5	1.9	1.4	0.2	0.7	0.02	<0.005	<0.005	
Total coliforms	orgs/100ml	>24,200	5,800	13,000	>24,200	>24,200	6,500	1,100	2,200	2,300	
E. coli	orgs/100ml	20	600	3,400	1,300	40	50	50	10	20	< 100
Thermotolerant coliforn	orgs/100ml	60	500	3,100	2,100	20	30	10	50	<10	
Total BGA	cells/ml	1,100	968,000	90	2,546,200	<1,178,600	10,100	49,400	<25,000	<24,500	< 5,000
Potentially toxic BGA	cells/ml	1,100	2,300	90	400	<50	76	1,400	400	140	

Interpretation of results

- Nitrate and Nitrite – below limits
- Cl and P levels – acceptable
- E. coli – exceeds thresholds in several ground-tanks
- Faecal coliforms – exceeds thresholds in all ground-tanks except the site grazed by sheep
- Total BGA – exceed thresholds at all sites (including supply channels)
- Several sites – excessive no.s of potentially toxic BGA

Suggestions?

- More sampling: ??
- Improve knowledge on effects/impacts on livestock health/performance: Yes
- Case studies/producer experience: Yes
- Economic analysis/scenario planning: Yes
- Identify good designers of systems: Yes