

PFAS – Riverina Water Experience

October 2025 | Presented by Jason Ip –
Manager Operations, Riverina Water

Introduction

- › Wagga PFAS Project Government Group
- › PFAS Risk Response Matrix
- › Overview of various PFAS fronts
 - Wagga's East and West ground water bore fields
 - Tarcutta ground water sources
- › Summary of PFAS Results
- › PFAS Management and Mitigation Responses

Wagga Wagga PFAS Risk Review Project Governance Group (PGG)

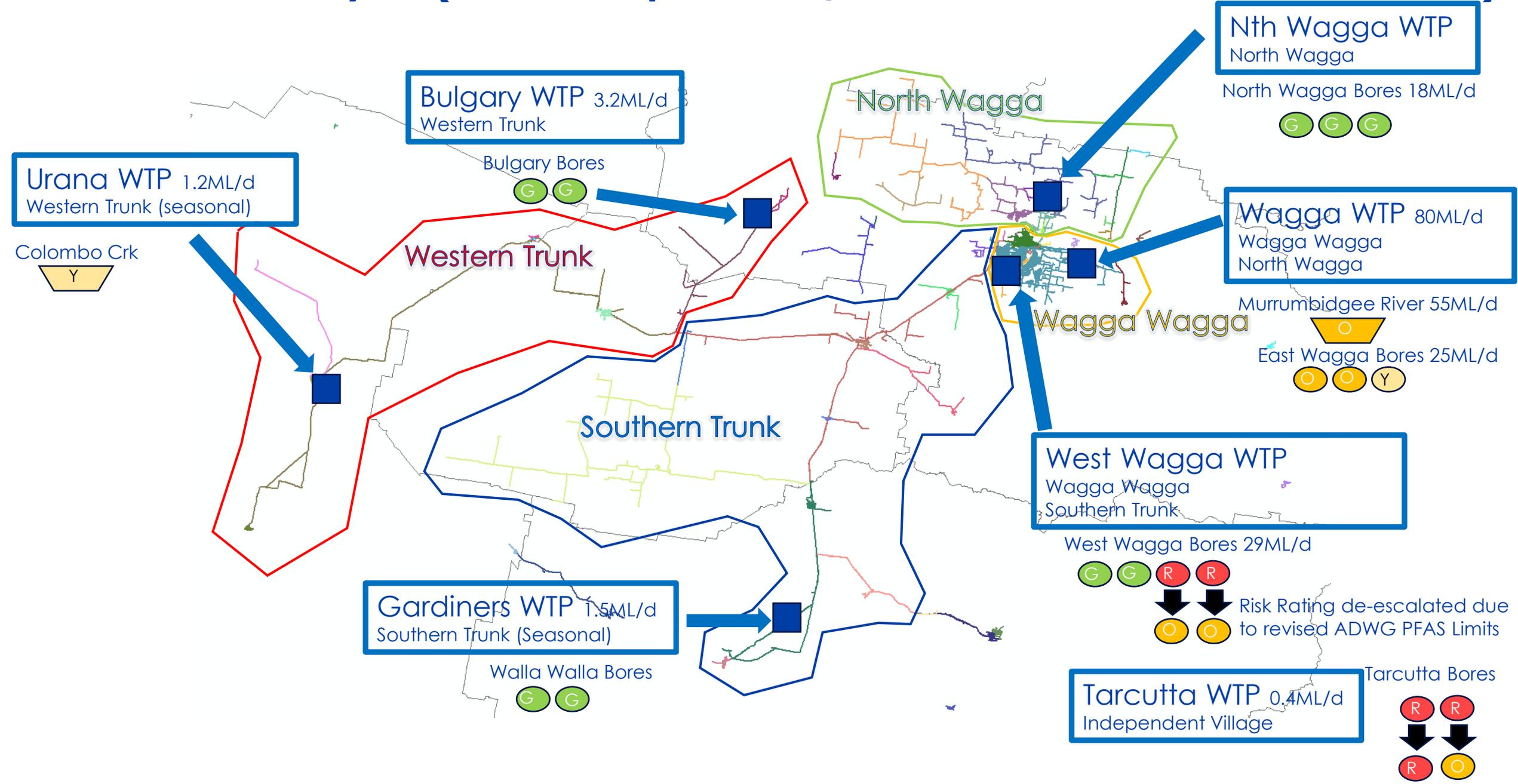
Reformed November 2023

- › NSW Department of Planning and Environment, Water Utilities
- › NSW Health
- › NSW EPA
- › Riverina Water County Council
- › Department of Defence
- › Goldenfields Water County Council
- › NSW Public Works
- › Wagga Wagga City Council

PFAS Risk Response Matrix

Tier	PFAS Response Level Description	Some Examples of Responses
0 Green	PFAS is NOT detectable, AND NO Foreseeable risk	<ul style="list-style-type: none"> - BaU - Annual sampling or source works
1 Yellow	PFAS is NOT detectable AND Heightened Risk	<ul style="list-style-type: none"> - BaU - Monthly sampling of source works
2 Orange	PFAS is detectable AND below ADWG limits	<ul style="list-style-type: none"> - BaU - Monthly sampling of source works to establish baseline data trends to eliminate temporal variation - Develop dilution mitigation procedures & controls - Investigate treatment options, alternative sources - Develop contingency plans, impact assessments, demand v. supply options such as alternative sources, demand mgt
3 Red	PFAS is above ADWG limits	<ul style="list-style-type: none"> - Immediately inform NSW Health and DCCEEW - Statistical analyse sampling data with NSW Health - Implement operational modifications to dilute source or treated water to below ADWG limits - If dilution options ineffective, cease source production & inform NSW Health and DCCEEW - Implement contingency plans: <ul style="list-style-type: none"> - Demand Management - Water Restrictions - Treatment and disposal options - Communications plans

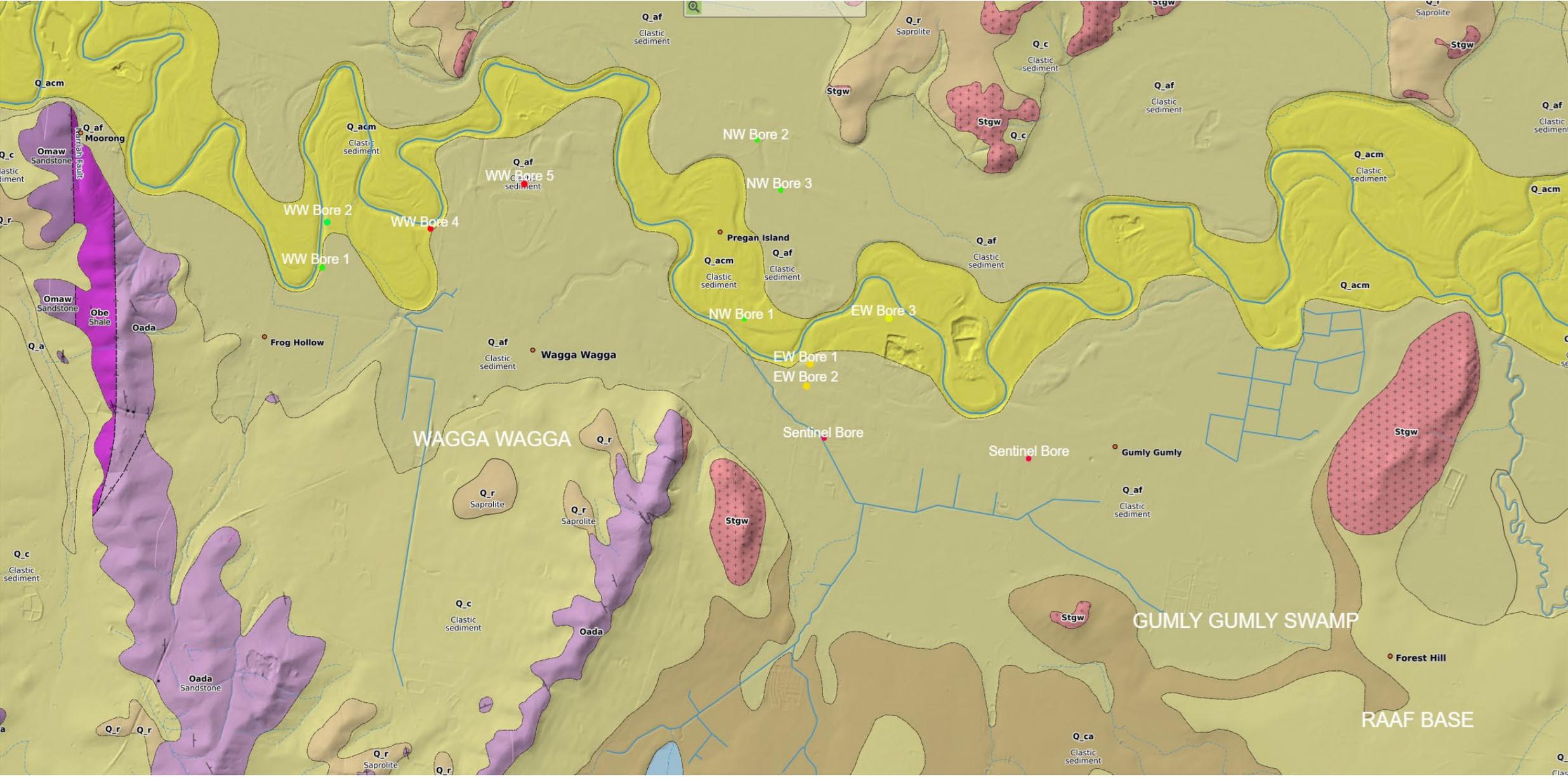
Situational Analysis (before & post adoption ADWG PFAS limits June 25)



Wagga Wagga and surrounding areas



Wagga Wagga Geology

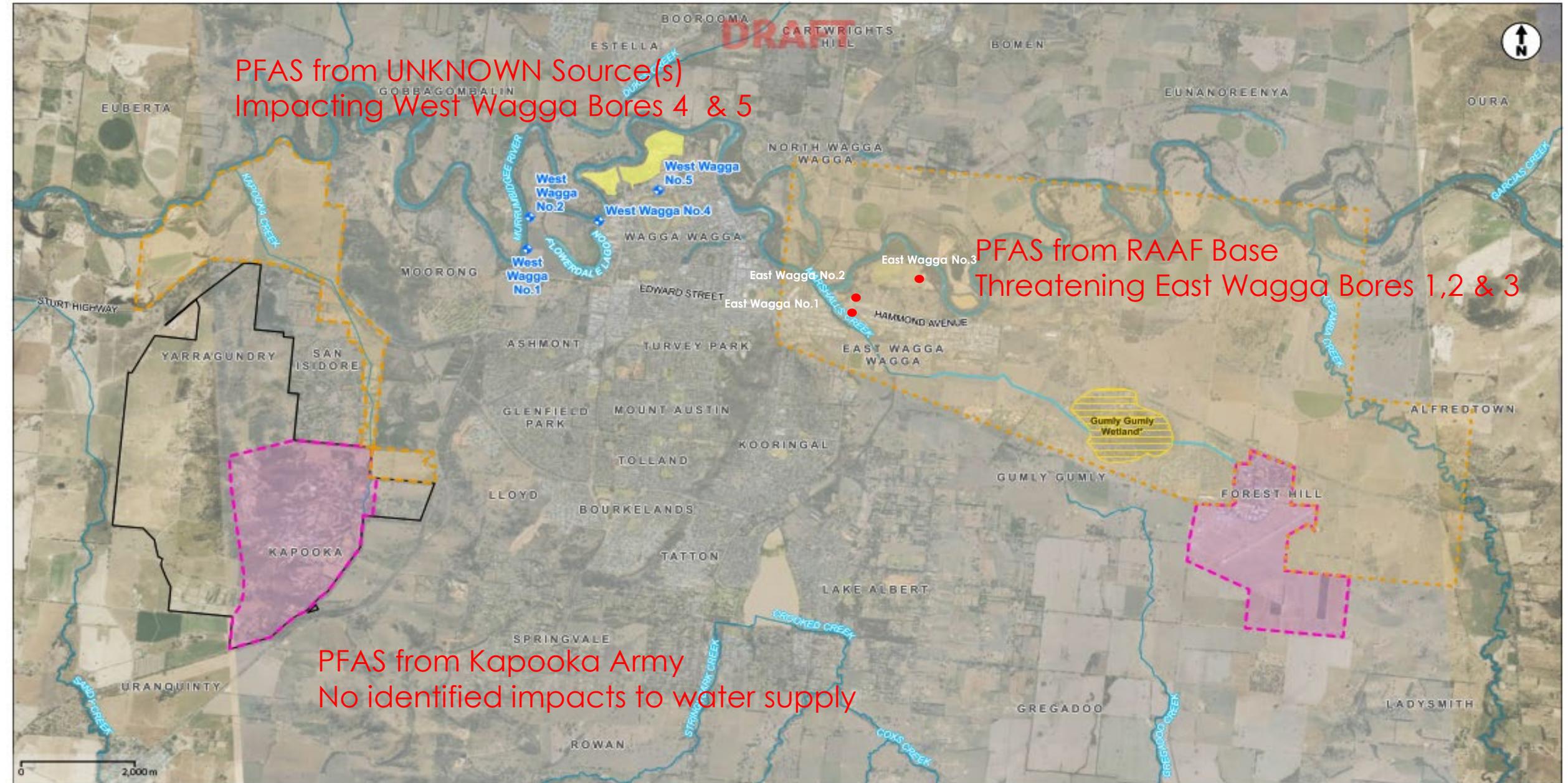


Wagga Wagga PFAS Sources

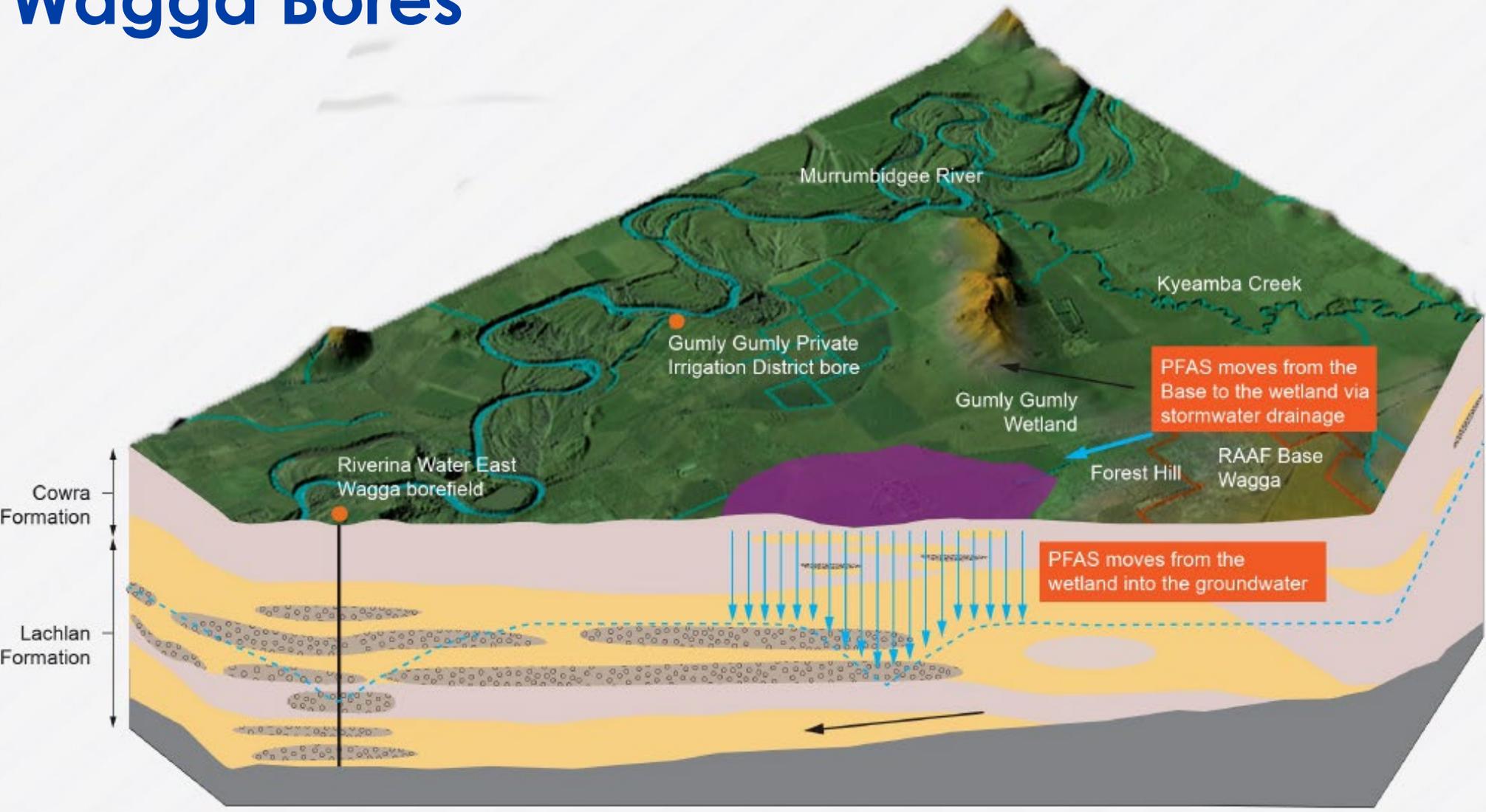
PFAS from UNKNOWN Source(s)
Impacting West Wagga Bores 4 & 5

PFAS from RAAF Base
Threatening East Wagga Bores 1,2 & 3

PFAS from Kapooka Army
No identified impacts to water supply



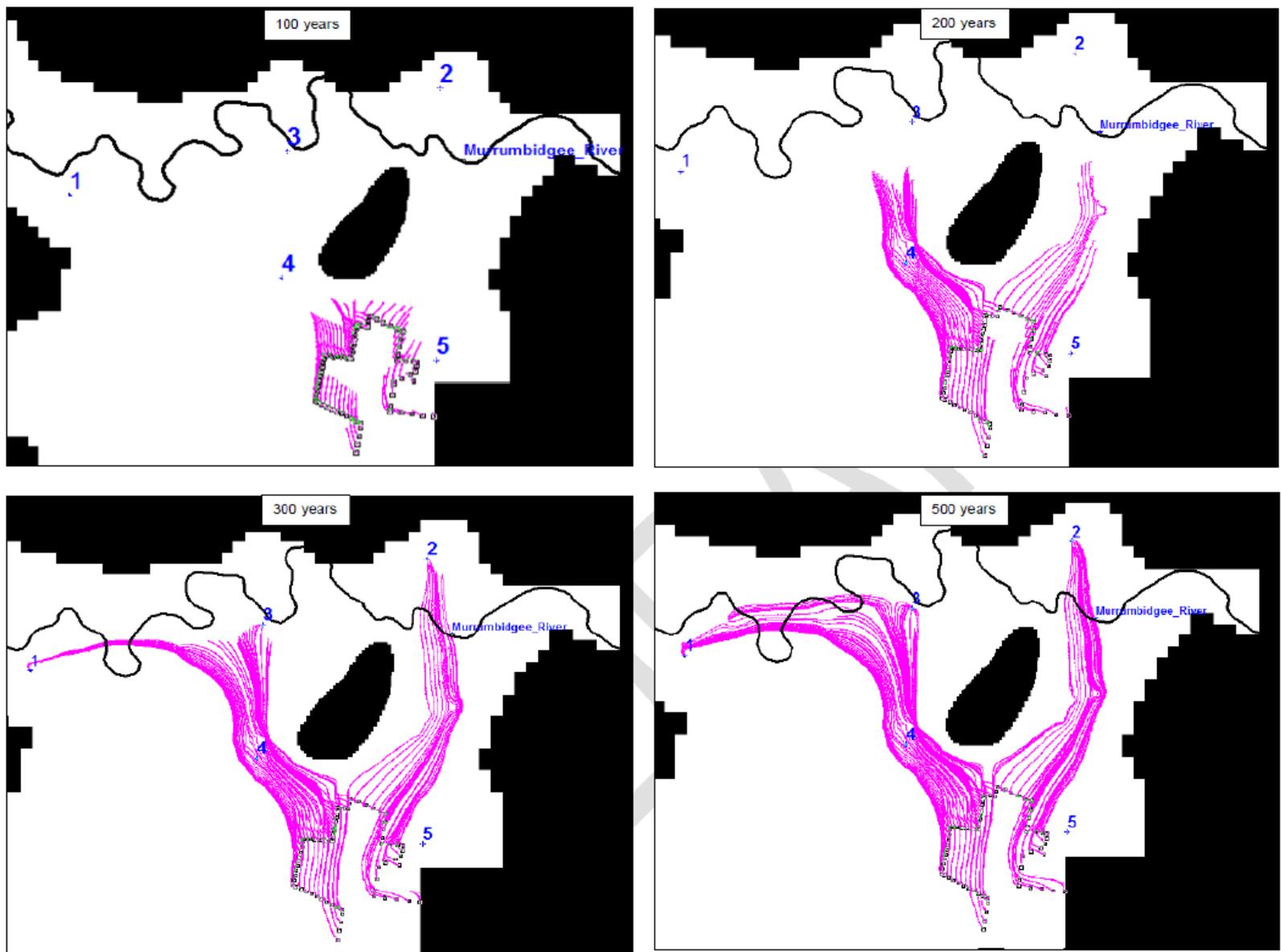
East Wagga Bores



- Granite
- Gravel
- Clay and silt
- Sand
- Indicative groundwater plume

- Water table
- PFAS Pathway
- Regional groundwater flow direction
- Groundwater bore
- RAAF Base Wagga boundary

Particle pathlines from Base



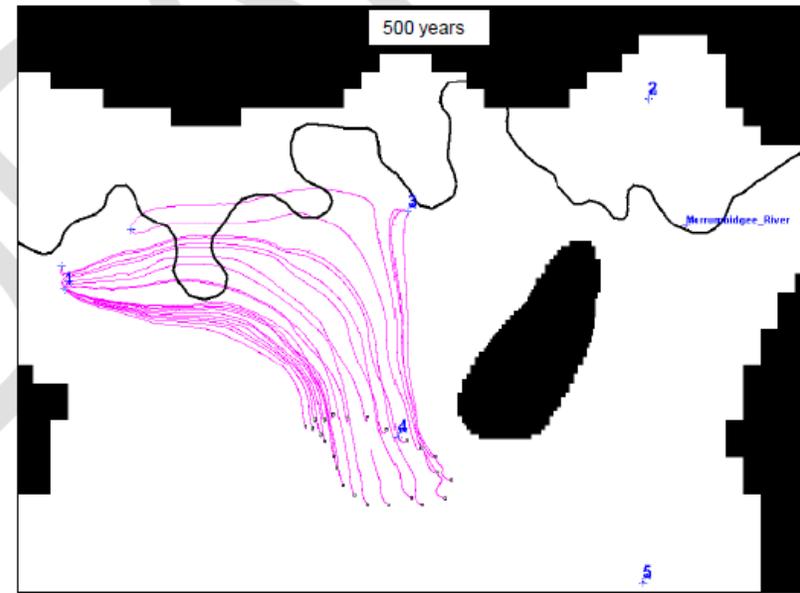
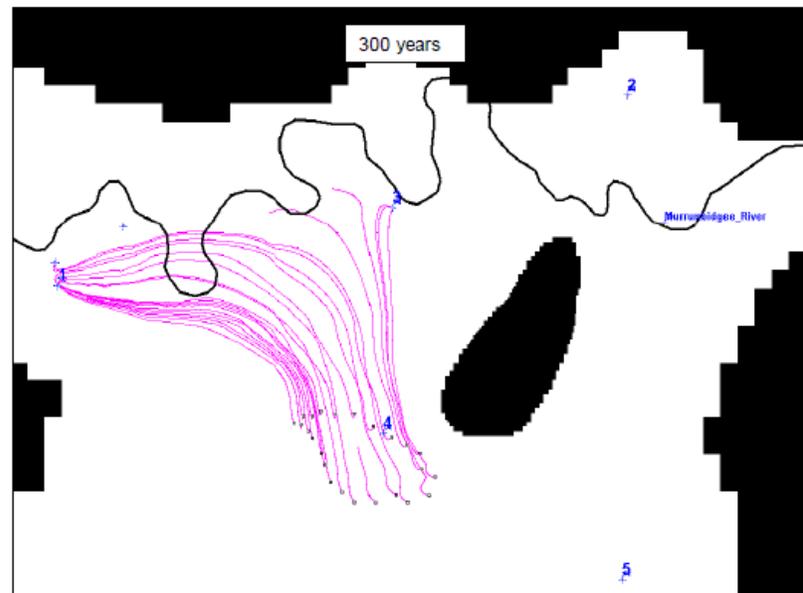
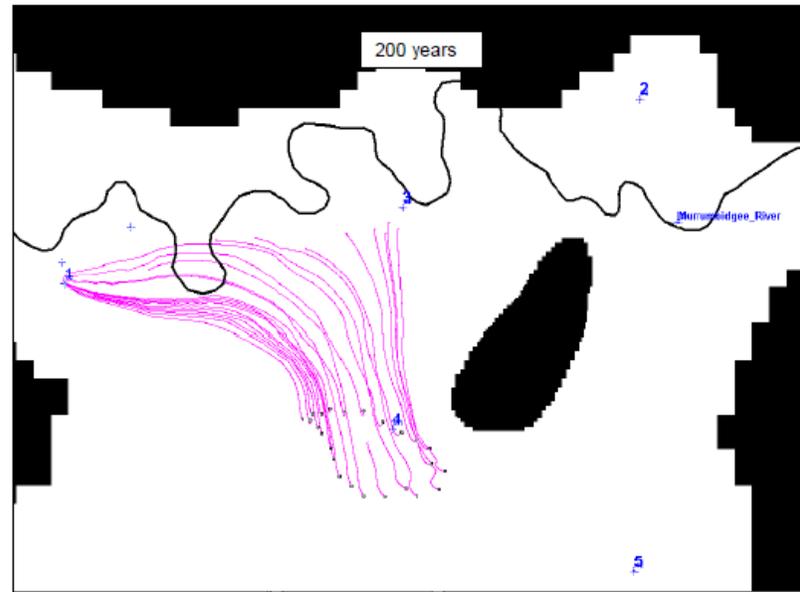
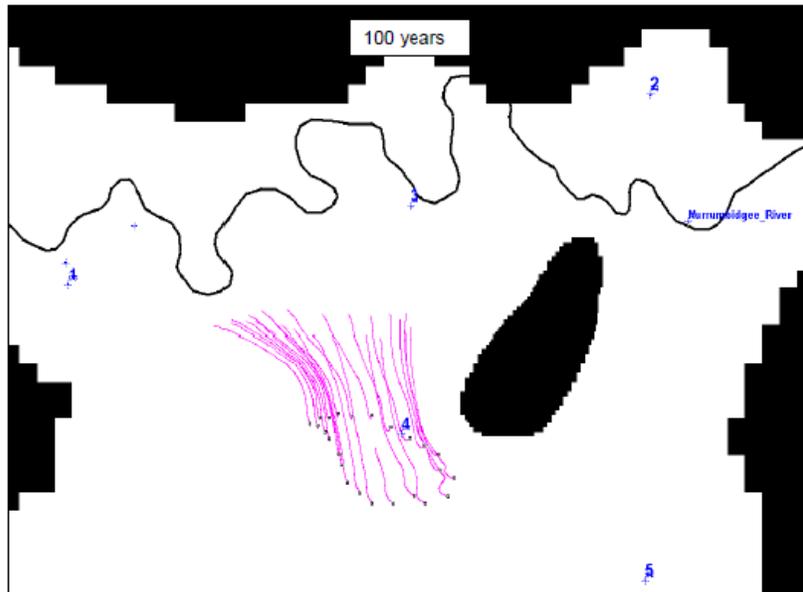
Receptors

1. RWCC East Wagga Borefield
2. GWCC Oura Borefield
3. Gumly Gumly Private Irrigation District bore
4. Murray Cod Hatchery
5. MW223 bore

Note:
Assumes
particles start
in Lachlan
Formation,
not at surface

Figure 8.4: Simulated particle pathlines from the Base.

Particle pathlines from Wetland



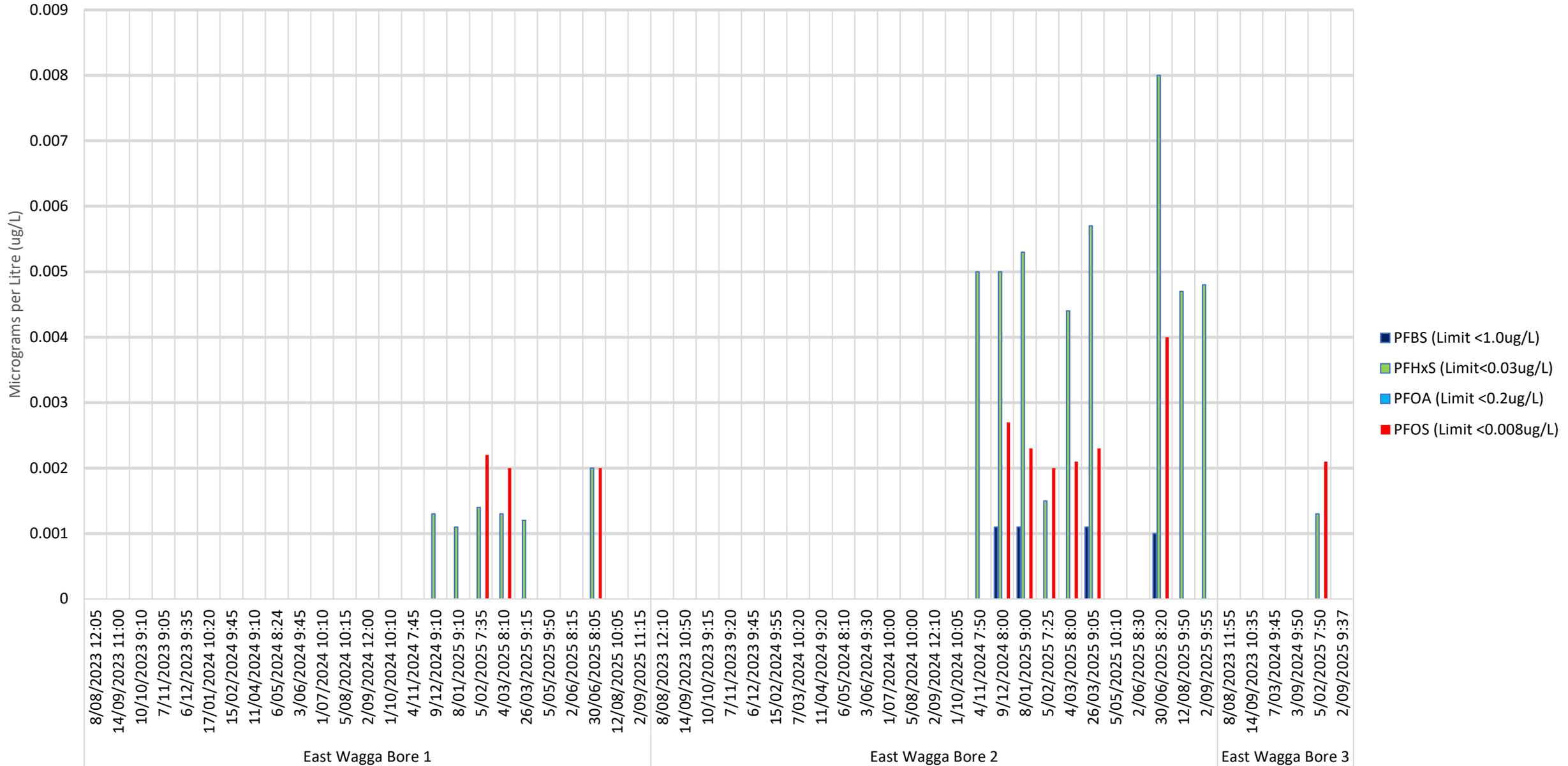
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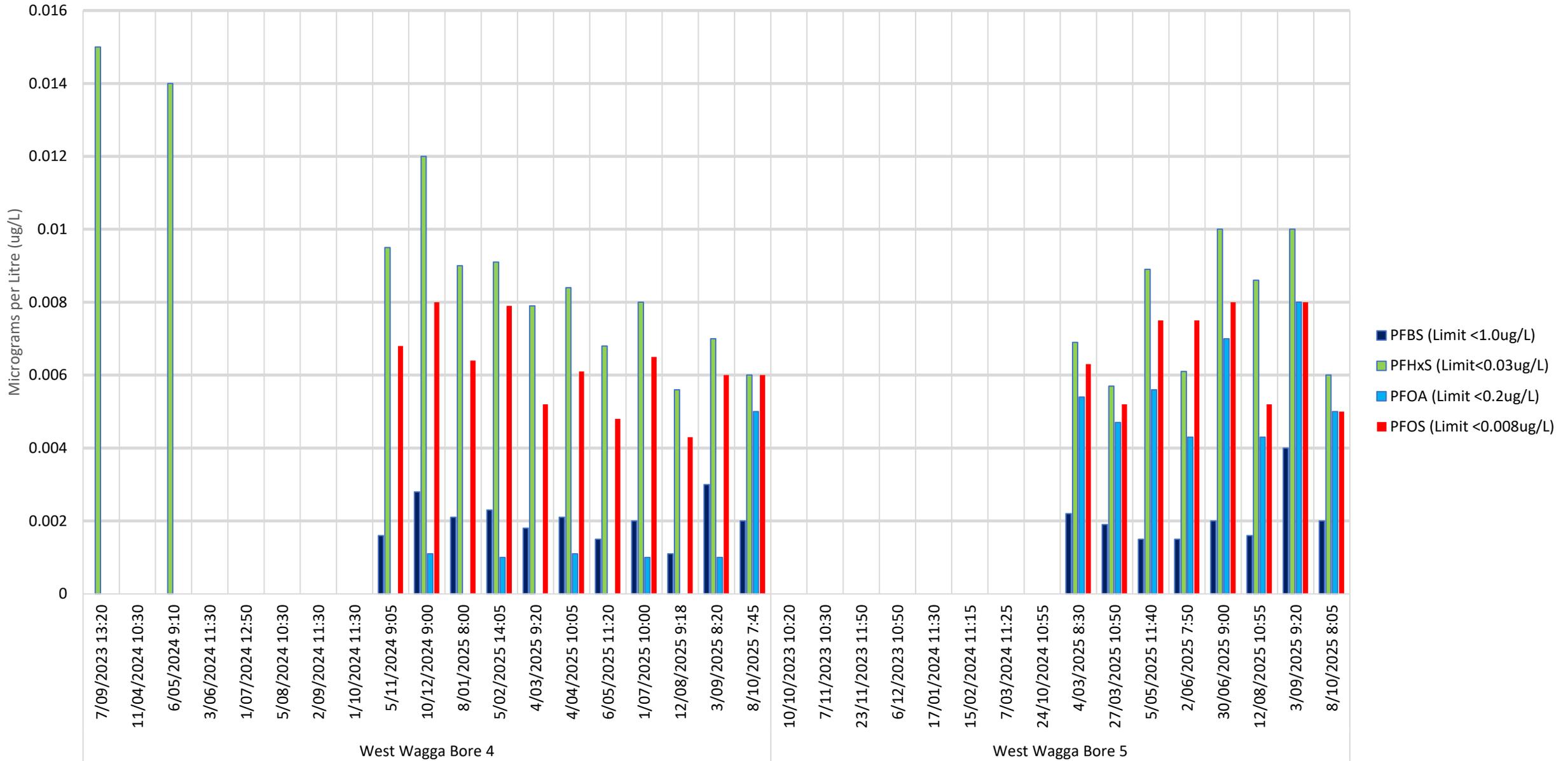
Note:
Assumes
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Formation,
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Figure 8.2: Simulated particle pathlines from Layer 2 at Gumly Gumly Wetland.

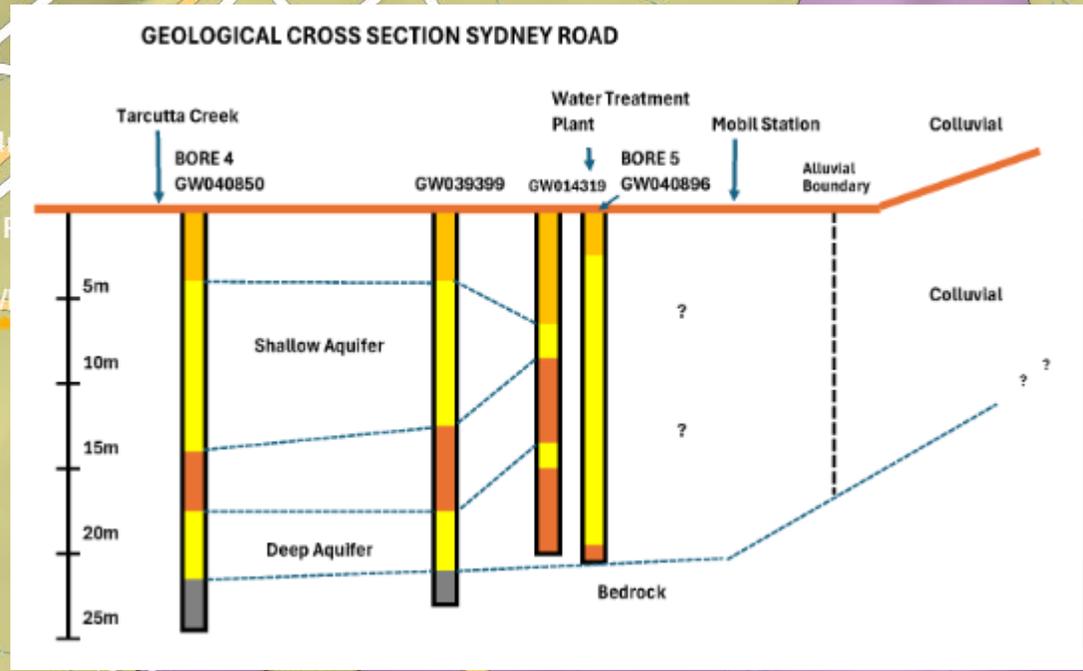
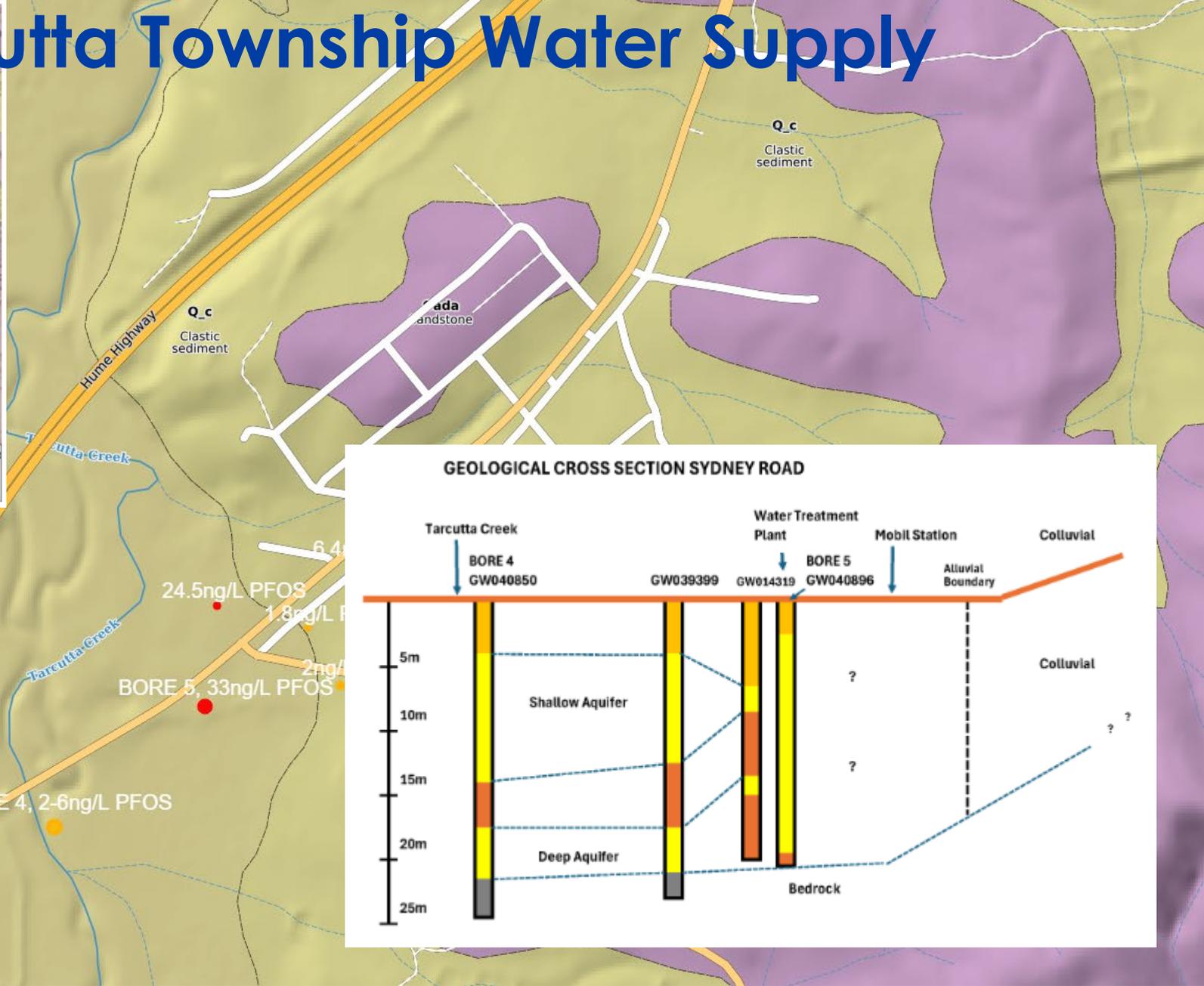
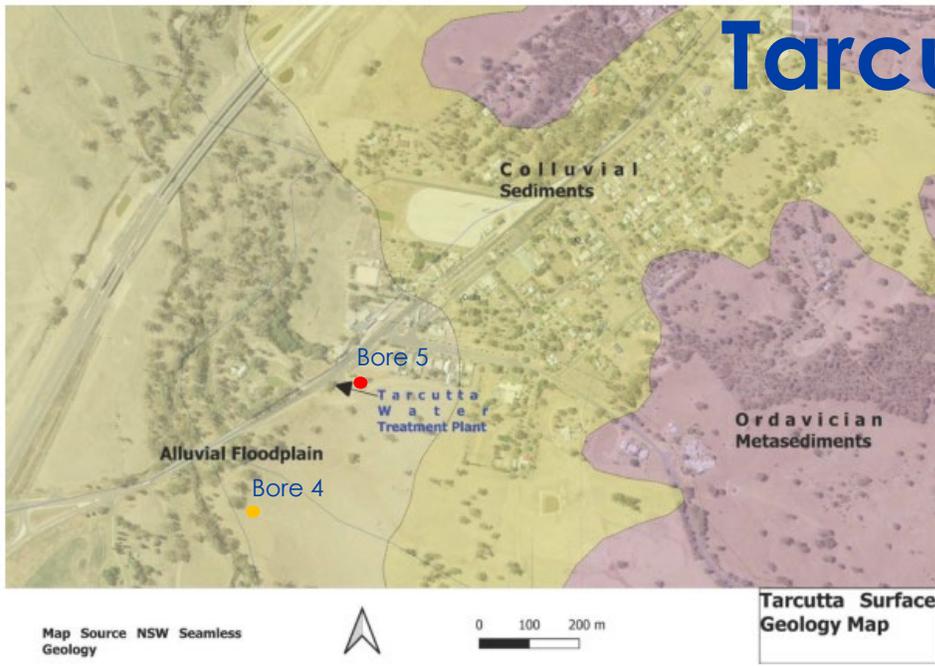
PFAS Historic Summary of Results - East Wagga Bores



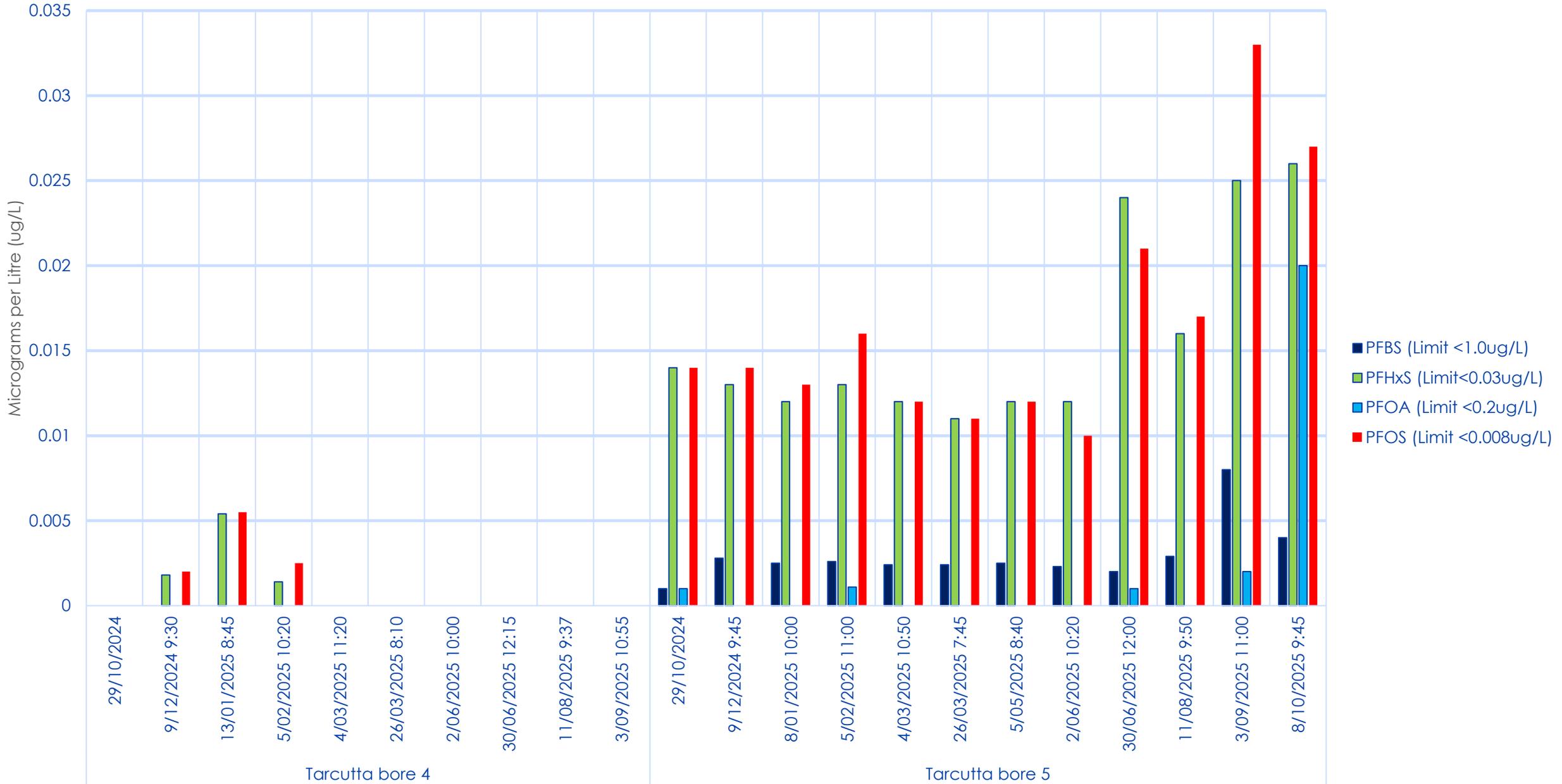
PFAS Historic Summary of Results – West Wagga Bores



Tarcutta Township Water Supply



PFAS Historic Summary of Results - Tarcutta



Summary of PFAS Results

Response Level	Location	PFBS (Limit <1.0ug/L)		PFHxS (Limit<0.03ug/L)		PFOA (Limit <0.2ug/L)		PFOS (Limit <0.008ug/L)	
		Percentile95	Count of Sample	Percentile95	Count of Sample	Percentile95	Count of Sample	Percentile95	Count of Sample
Tier 1	East Wagga Bore 1	0.0	25	0.00	25	0.0	25	0.002	25
Tier 1	East Wagga Bore 2	0.0	26	0.01	26	0.0	26	0.003	26
Tier 1	East Wagga Bore 3	0.0	6	0.00	6	0.0	6	0.002	6
Tier 0	Murrumbidgee river	0.0	11	0.00	11	0.0	11	0.002	11
Tier 2	Tarcutta bore 4	0.0	10	0.00	10	0.0	10	0.004	10
Tier 3	Tarcutta bore 5	0.0	12	0.03	12	0.0	12	0.030	12
Tier 0	West Wagga Bore 1	0.0	11	0.00	11	0.0	11	0.000	11
Tier 0	West Wagga Bore 2	0.0	10	0.00	10	0.0	10	0.000	10
Tier 2	West Wagga Bore 4	0.0	19	0.01	19	0.0	19	0.008	19
Tier 2	West Wagga Bore 5	0.0	16	0.01	16	0.0	16	0.008	16

Response Level	Risk Response Rating	Response Level Description	Sampling Frequency
Tier 0	No Foreseeable Risk	PFAS is NOT detectable in raw water AND NO foreseeable risk	6 Monthly to Annual Sampling
Tier 1	Heightened Risk	PFAS is NOT detectable in raw water AND heightened Risk	Monthly Sampling
Tier 2	Actual Risk	PFAS is detectable in raw water source(s) AND BELOW ADWG limits	Monthly Sampling
Tier 3	Mitigation required	PFAS is detectable in raw water source(s) AND ABOVE ADWG limits	Monthly Sampling

PFAS Management & Mitigation Response

In general:

- › Monthly sampling of threatened and affected source works
- › “Dilution is the solution”
- › Open and transparent and consistent communication
- › Reassurance that Riverina Water will only provide safe drinking water
- › Engagement, consultation and coordination with NSW Health, NSW DCCEEW, NSW EPA, Defence Department, community, customers, media
- › Development specific mitigation and contingency plans
 - Demand Mgt, Drought Response, alternative sources, treatment options, waste disposal

PFAS Management & Mitigation Response

Dilution mitigation

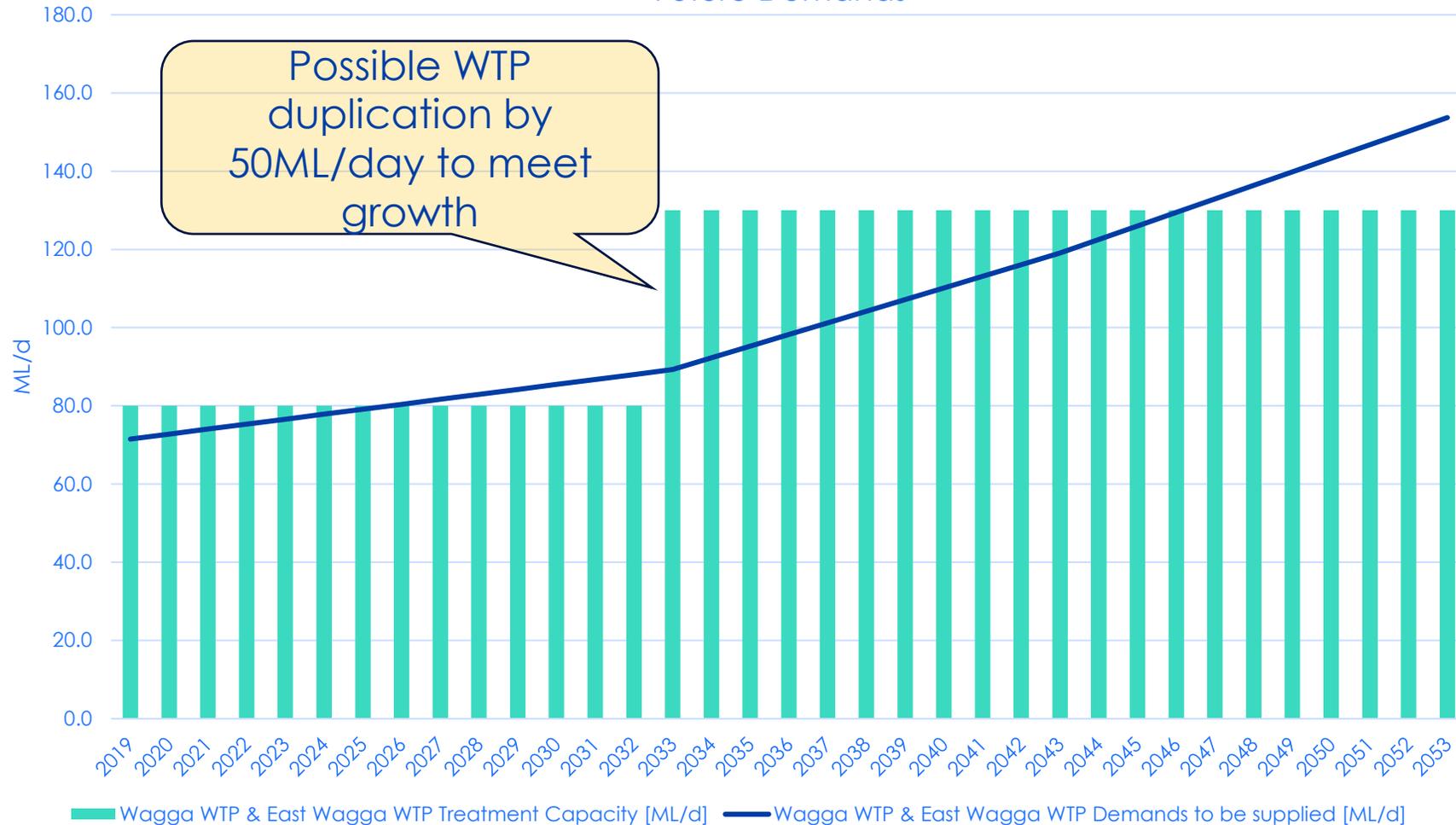
	Full Production	Full Production	Scenario 0	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
	L/s	ML/day	PFOS [ng/L]					
East Wagga Bore 1	100	9	2	2	4	6	8	10
East Wagga Bore 2	100	9	2	4	6	8	10	12
East Wagga Bore 3	100	9	2	2	2	4	6	8
Subtotal	300	26						
		Resulting East Wagga PFOS ng/L	2.00	2.67	4.00	6.00	8.00	10.00

	Full Production	Full Production	Scenario 0	Scenario 1	Scenario 2	Scenario 3
	L/s	ML/day	PFOS [ng/L]			
West Wagga Bore 1	70	6	0	0	0	0
West Wagga Bore 2	90	8	0	0	0	0
West Wagga Bore 4	90	8	7	8	15	20
West Wagga Bore 5	90	8	7	7	15	15
Subtotal	340	29				
		Resulting West Wagga Production PFOS ng/L	3.71	3.97	7.94	9.26

PFAS Management & Mitigation Response

Strategic Growth Planning – Wagga WTP Peak Day's Demand

Combined Wagga WTP & East Wagga WTP Treatment PDD Capacity Versus Future Demands



Possible WTP duplication by 50ML/day to meet growth

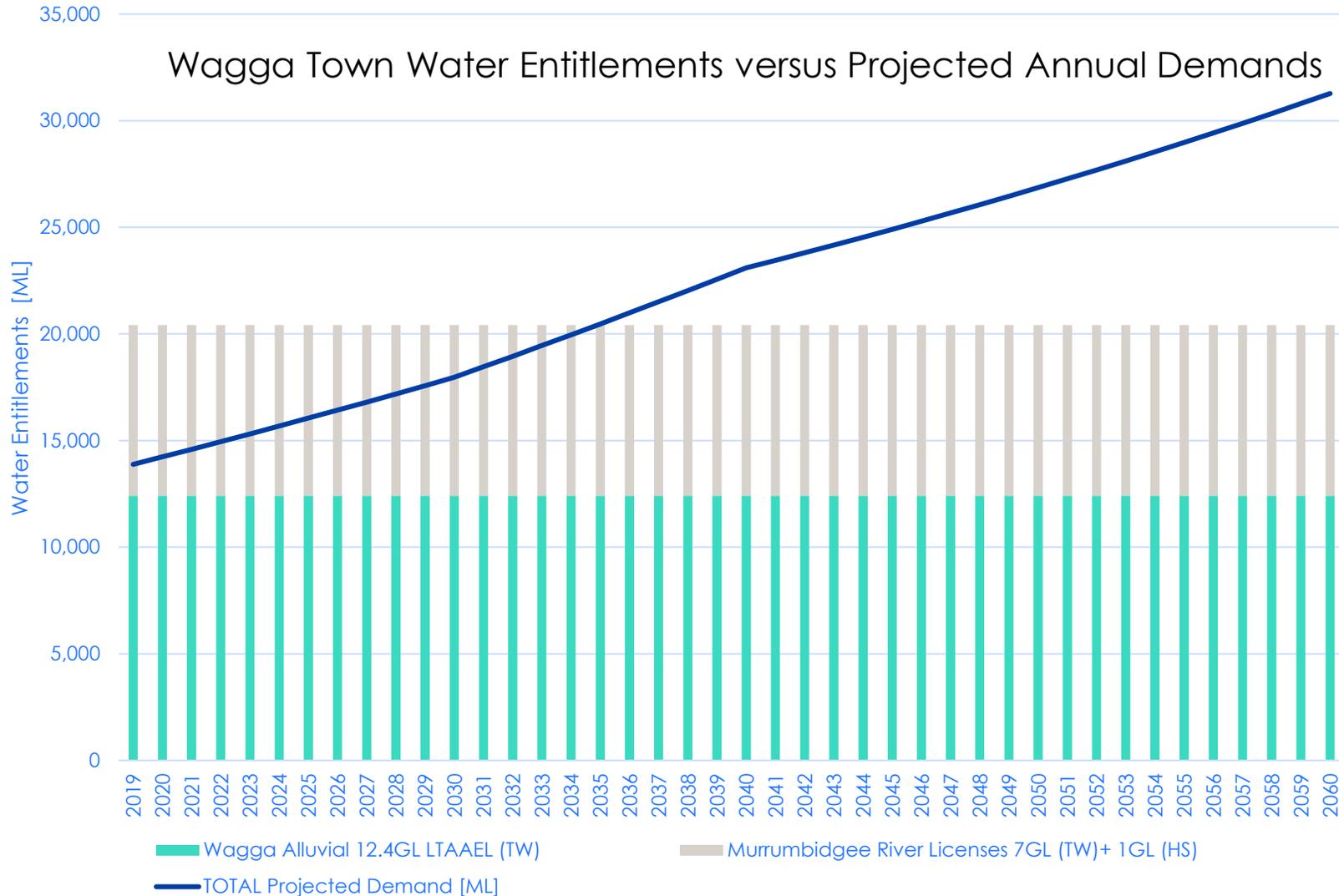
New filtration WTP required to meet growth

Work in progress to investigate contingency of an additional 25ML/d filtration plant capacity if/when East Wagga Bores become unusable

- Treatment options
- Alternative supplies
- Increasing alternate source & WTP capacities (in addition to growth)

PFAS Management & Mitigation Response

Strategic Growth Planning – Wagga Wagga Water Entitlements



East Wagga Bores production ranges between 4.5-5.5 GL/year. If unusable from PFAS, require substitution to surface water requiring additional surface water entitlements (in addition to BaU growth requirements)

Special Purpose Access License - SPAL
 NSW DCCEEW supported changes to Water Sharing Plan for Murrumbidgee Regulated River Water Source 2016 to allow mechanism of a contingent Special Purpose Access License (SPAL) for Riverina Water to access surface water

PFAS Management & Mitigation Response

Demand Management - Tarcutta

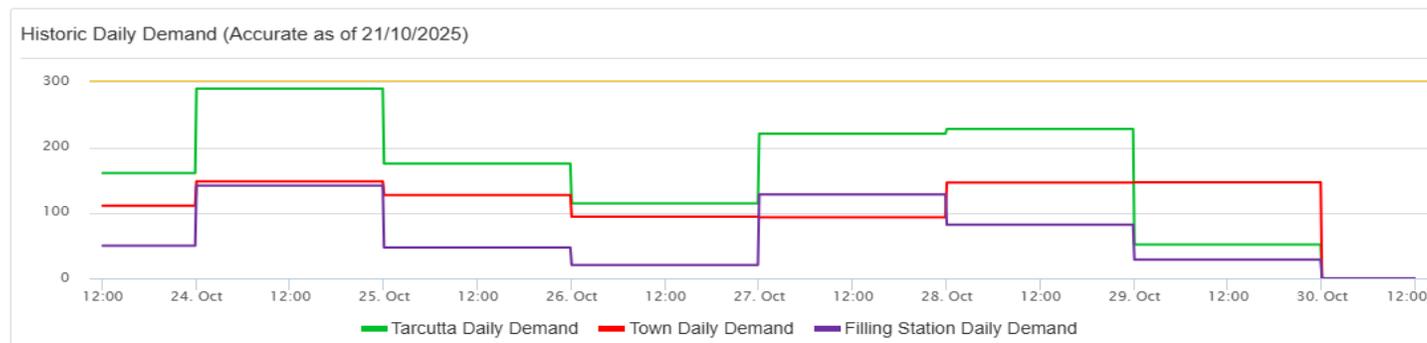
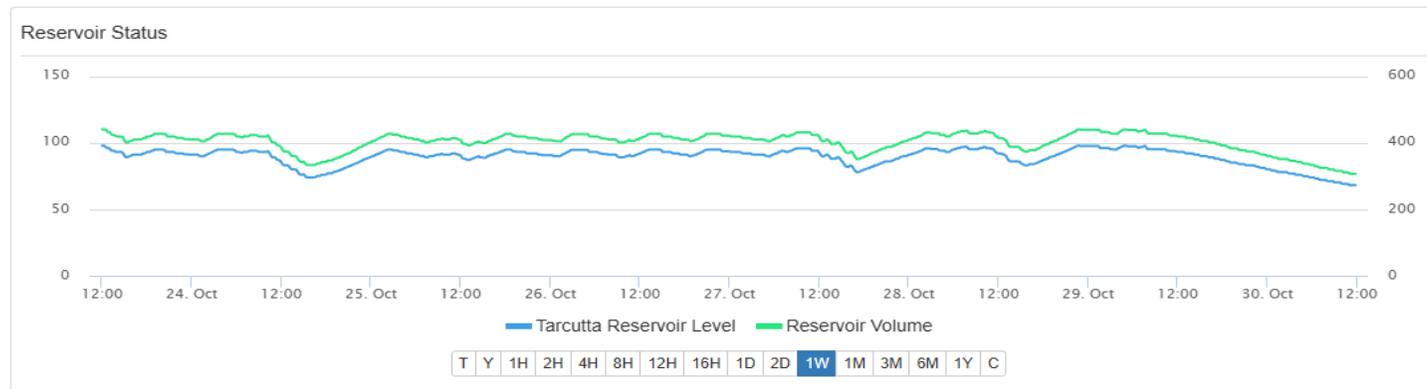


Sign in

Tarcutta System Dashboard

The values update every 30 minutes.

Developed online dashboard so HumeLink can self assess & manage their water usage ie. No surprises if we intervene and shut down the local filling station



PFAS Management & Mitigation Response

- › Tarcutta: investigating alternative supply options e.g. TfNSW bore used during Tarcutta Hume Hwy bypass, 35km pipeline option, treatment options
- › Wagga: consideration of increasing surface water source works in addition to growth response
- › Investigating synergies between Riverina Water and Goldenfields Water's strategic growth plans
- › Keeping abreast of PFAS treatment & removal technologies
- › Refreshing demand management plans and drought management plans in response reduce production capacity and resilience
- › Keeping abreast of PFAS governance changes and advocacy
 - Advocating balanced and consistent approach to PFAS risk management, legislation and agencies' responses
 - PFAS EPA's (Draft) Resource Order and Exemption for Biosolids proposal for Margin of Safety of 2 not necessarily evidence-based, resulting in potential significant costs for transport and alternative disposal and contradicting NSW government's Circular Economy principles
- › Seeking alignment and coordination between government agencies, together with cost sharing arrangements to assist LWUs

- › NSW Health
 - Initially screening raw and treated water supplies
 - Subsidising PFAS testing till end of this calendar year
 - Ongoing valued advice and engagement with Riverina Water
- › NSW DCCEW
 - Coordinating the Wagga PFAS Project Governance Group
 - Introducing contingent SPAL into Water Sharing Plan into Murrumbidgee Regulated River Water Sharing Plan
 - Ongoing valued advice and engagement with Riverina Water
- › NSW EPA
 - Attending Wagga PFAS Project Governance Group
 - Conducting community screening exercise of private bores outside Tarcutta township
- › Commonwealth Defence Department
 - Ongoing open and transparent engagement and valued advice via their principal consultant (Jacob)
- › Australian Water Association
 - Coordination of comms and community engagement advice between water utilities

Thank You !!!



Thank You

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