LEAVE OF ABSENCE/APOLOGIES

At the time of preparation of the business paper no apologies have been received.

ATTENDANCE OF COUNCILLORS BY AUDIO-VISUAL LINK

Councils Code of Meeting Practice permits Councillors to attend and participate in meetings of the council with the approval of the council or relevant committee.

Clauses 5.19 - 5.30 of the Code of Meeting Practice provides the parameters for eligibility and requirements for remote attendance.

WEBCASTING OF COUNCIL MEETINGS

Attendees of this meeting are reminded that:

a) The meeting is being recorded and made publicly available on Council's website, and

b) Persons attending the meeting should refrain from making any defamatory statements.

STATEMENT OF ETHICAL OBLIGATIONS

Councillors are reminded of the oath or affirmation of office they have taken under section 233A of the Act.

The governing body of a county council is responsible for managing the affairs of the county council. Each Councillor as a member of the governing body has a responsibility to make considered and well-informed decisions to ensure that the exercise of the functions of Goldenfields Water are performed to benefit the whole of the area of operations of Goldenfields Water.

In addition Councillors are reminded of their obligations under council's code of conduct to disclose and appropriately manage conflicts of interest.

ACKNOWLEDGEMENT OF COUNTRY

I would like to acknowledge the Wiradjuri people who are the Traditional Custodians of the Land. I would also like to pay respect to their people both past and present and extend that respect to other Aboriginal Australians who are present.

PRESENTATIONS

No presentations are scheduled for this meeting.

DECLARATION OF PECUNIARY INTERESTS

Declaration of Interest

Councillors and senior staff are reminded of their obligation to declare their pecuniary interest in any matters listed before them.

Councillors may declare an interest at the commencement of the meeting, or alternatively at any time during the meeting should any issue progress or arise that would warrant a declaration.

Councillors must state their reasons in declaring any type of interest.

DECLARATION OF NON PECUNIARY INTERESTS

Declaration of non Pecuniary Interest

Councillors and senior staff are reminded of their obligation to declare their interest in any matters listed before them.

In considering your interest you are reminded to include non-pecuniary and conflicts of interest as well as any other interest you perceive or may be perceived of you.

Councillors may declare an interest at the commencement of the meeting, or alternatively at any time during the meeting should any issue progress or arise that would warrant a declaration.

Councillors must state their reasons in declaring any type of interest.

CONFIRMATION OF MINUTES

It is recommended that the minutes of the meeting held 27 October 2022 having been circulated to members be confirmed as a true and accurate record.

BUSINESS ARISING FROM MINUTES

At the time of preparation of the business paper no business was arising from minutes.

CORRESPONDENCE

At the time of preparation of the business paper no relevant correspondence had been received for inclusion.

MATTERS OF URGENCY

In accordance with clause 9.3 of Councils Code of Meeting Practice, business may be transacted at a meeting without due notice only if:

a) A motion is passed to have the business transacted at the meeting, and

b) The business to be considered is ruled by the chairperson to be of great urgency on the grounds that it requires a decision by the council before the next scheduled ordinary meeting of the council.

NOTICES OF MOTION/RESCISSION MOTIONS

At the time of preparation of the Business Paper no Notices of Motion or Rescission Motions have been received.

CHAIRPERSONS MINUTE

At the time of preparation of the Business Paper the Chairperson had not issued a report for publication.

PUBLIC PARTICIPATION - CONFIDENTIAL SESSION

In accordance with the Local Government Act 1993 and the Local Government (General) Regulations 2005, in the opinion of the General Manager the following business is of a kind as referred to in section 10A(2) of the Act and should be dealt with in part of the meeting closed to the media and public.

It is recommended that Council move into CONFIDENTIAL SESSION.

CONCEALED LEAK POLICY APPLICATION

*This report is **CONFIDENTIAL** in accordance with Section 10A(2) of the Local Government Act 1993, which permits the meeting to be closed to the public for business relating to the following:*

(b) the personal hardship of any resident or ratepayer

TENDER 05/2022 – SUPPLY OF PUMPS – OURA PUMP STATION

*This report is **CONFIDENTIAL** in accordance with Section 10A(2)(d)(i) of the Local Government Act 1993, which permits the meeting to be closed to the public for business relating to the following:*

d) Commercial information of a confidential matter that would, if disclosed:

(i) prejudice the commercial position of the person who supplied it,

SCADA & CONTROL SYSTEMS INTEGRATION SUPPORT

*This report is **CONFIDENTIAL** in accordance with Section 10A(2)(d)(i) of the Local Government Act 1993, which permits the meeting to be closed to the public for business relating to the following:*

d) Commercial information of a confidential matter that would, if disclosed:

(i) prejudice the commercial position of the person who supplied it,

EXITING CONFIDENTIAL

There being no further confidential items it is recommended that Council revert back to Open Session and that the resolutions made in Confidential Session be made public.

The General Manager is to read out any resolutions made in Confidential Session.

GOLDENFIELDS WATER COUNTY COUNCIL – DECEMBER 2022

COUNCIL CASH AND INVESTMENTS

Report prepared by Corporate Services Manager

COUNCIL OFFICER RECOMMENDATION

That the report detailing Council Cash and Investments as at 31st October 2022 be received and noted.

ALIGNMENT WITH BUSINESS ACTIVITY STRATEGIC PLAN

09 Financially Sustainable

BACKGROUND

A report on Council's Investments is required to be presented for Council's consideration in accordance with Clause 212 of the Local Government (General) Regulation 2005.

REPORT

Council's cash and investment portfolio increased by $553,514 from $40,761,611 as at 30th September 2022 to $41,135,125 as at 31st October 2022.

Cash and Investment Portfolio

Type	Rating	SP RATIN	Issuer	Frequency	Purchase	Maturity	Days	Rate	Benchmark*	Principal
TD	BBB-	A3	Judo Bank	At Maturity	29/10/2021	2/11/2022	369	1.01	3.09	$2,000,000
TD	A+	A1	Macquarie Bank	At Maturity	29/10/2021	2/11/2022	369	0.55	3.09	$1,000,000
TD	BBB	A2	AMP Bank	Annual	17/11/2021	17/11/2022	365	1.00	3.09	$3,000,000
NOTICE	BBB	A2	AMP Bank	At Maturity	12/01/2021	5/12/2022	692	1.80	3.09	$2,000,000
NOTICE	BBB	A2	AMP Bank	At Maturity	12/01/2021	5/12/2022	692	1.80	3.09	$2,081,638
NOTICE	BBB	A2	AMP Bank	At Maturity	16/02/2021	5/12/2022	657	1.80	3.09	$2,000,000
TD	A+	A1	Macquarie Bank	At Maturity	13/09/2022	23/12/2022	101	3.43	3.09	$1,000,000
TD	BBB+	A2	BOQ	At Maturity	12/07/2022	12/01/2023	184	3.35	3.09	$1,000,000
TD	BBB	A2	AMP Bank	At Maturity	14/07/2022	12/01/2023	182	3.60	3.09	$2,000,000
TD	A+	A1	Macquarie Bank	At Maturity	13/09/2022	23/01/2023	132	3.43	3.09	$1,000,000
TD	A+	A1	Macquarie Bank	At Maturity	16/03/2022	15/02/2023	336	1.15	3.09	$3,000,000
td	AA-	A1+	CBA	At Maturity	17/08/2022	22/02/2023	189	3.51	3.09	$4,000,000
TD	AA-	A1+	CBA	Half Year	20/07/2022	1/03/2023	224	3.82	3.09	$1,000,000
TD	AA-	A1+	CBA	Half Year	28/04/2022	3/05/2023	370	2.73	3.09	$4,000,000
TD	BBB+	A2	ME Bank	At Maturity	27/05/2022	1/06/2023	370	3.18	3.09	$4,000,000
TD	BBB+	A2	BOQ	Annual	1/06/2022	5/07/2023	399	3.20	3.09	$2,000,000
TD	AA-	A1+	NT Treasury	Annual	10/09/2020	15/12/2023	1191	1.00	3.09	$2,000,000
TD	AA-	A1+	NT Treasury	Annual	28/09/2020	15/12/2024	1539	1.10	3.09	$1,000,000
CASH	A+	A1	Macquarie Bank	Monthly				0.55	2.60	$2,519,158
CASH	AA-	A1+	CBA	Monthly				0.20	2.60	$10,208
CASH	AA-	A1+	CBA	N/A				0.00	2.60	$704,121
TOTAL:										**$41,315,125**

GOLDENFIELDS WATER COUNTY COUNCIL – DECEMBER 2022

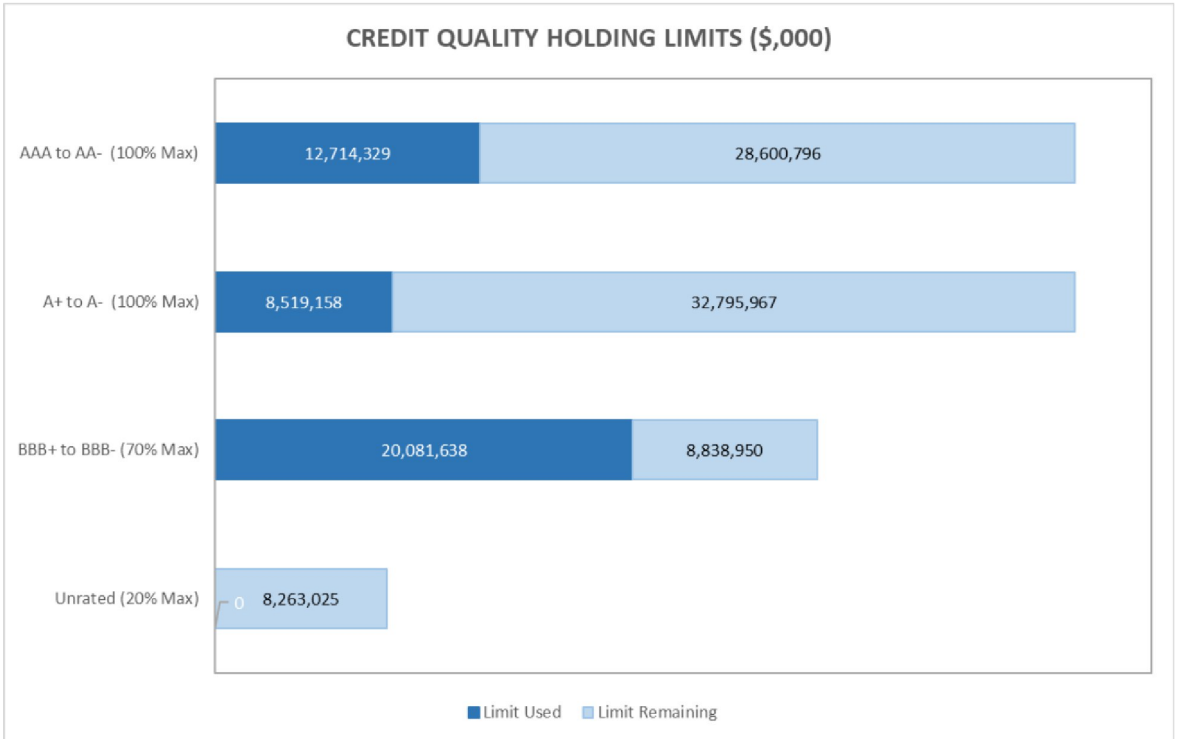
Performance

Goldenfields Water County Council's investment portfolio fell short of the relevant BBSW Index benchmark by 1%. The average weighted yield for September was 2.01%.

Total Cost	Yearly Interest Received	Weighted Average Term
41,315,125	97,115	143 days
Total Value	**Monthly Interest Received**	**Weighted Average Yield**
41,315,125	1,820	2.01%

Credit Quality Compliance

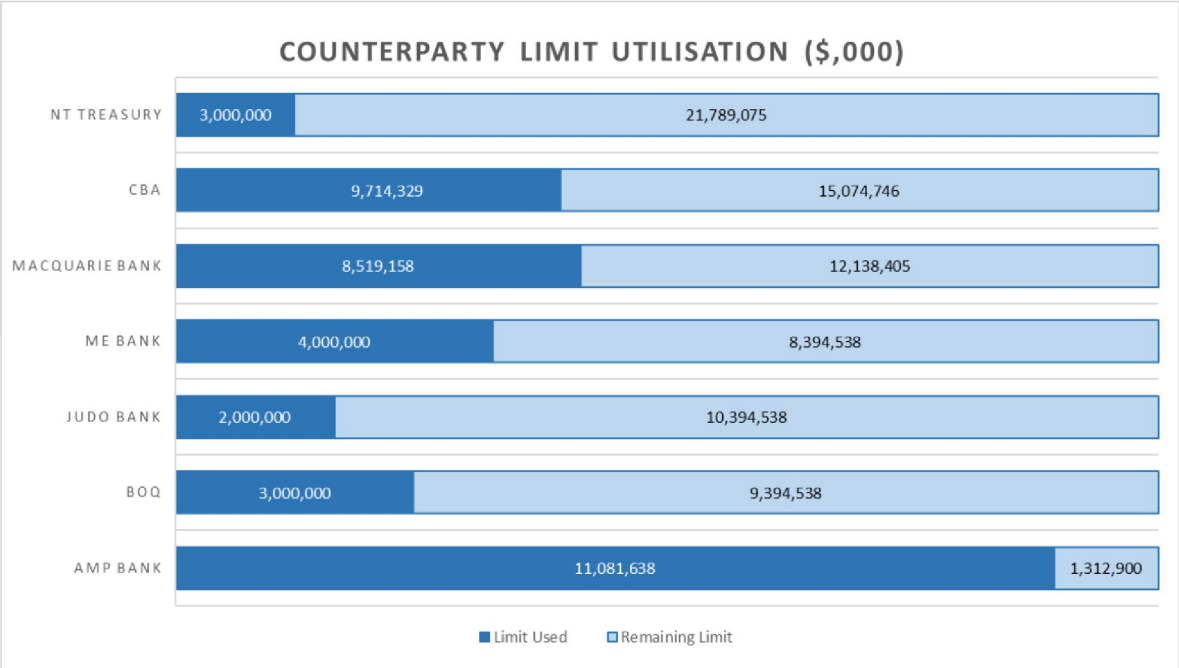
Council's investment portfolio was compliant with policy in terms of S&P long term rating credit quality limits, as displayed below.



Counter Party Compliance

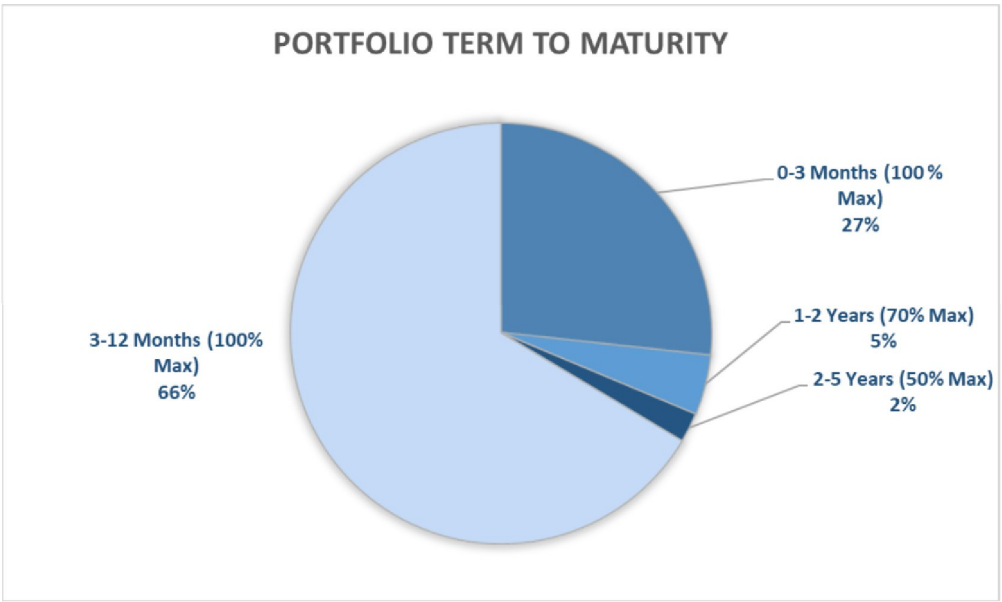
As at the end of September, Council was compliant with policy in terms of individual financial institution capacity limits. It is worth noting that capacity limits are affected by changes in the on-call account balance compared to the total portfolio balance.

Overall, the portfolio is diversified across a variety of credit ratings, including some exposure to unrated ADIs



Term to Maturity

Council's investment portfolio maturities shown graphically below were also compliant with policy requirements.



Application of Investment Funds

The table below details the allocation of cash balances in terms of restricted funds, noting restrictions are all internal rather than external.

Restricted Funds:	
Employee Leave Entitlement	2,492,494
Plant & Vehicle Replacement	2,552,513
Infrastrucrure Replacement	16,249,774
Unrestricted Funds	20,020,344
TOTAL	**41,315,125**

Declaration

I hereby certify that investments listed in the report have been made in accordance with Section 625 of the Local Government Act 1993, Clause 212 of the Local Government (General) Regulation 2005 and Council's Investment Policy PP004.

Signed

John Chapman
Responsible Accounting Officer

FINANCIAL IMPACT STATEMENT

Council's cash and investment portfolio increased by $553,514 from $40,761,611 as at 30th September 2022 to $41,315,125 as at 31st October 2022.

ATTACHMENTS: Nil.

TABLED ITEMS: Nil.

GOLDENFIELDS WATER COUNTY COUNCIL – DECEMBER 2022

PROGRESS REPORT - CAPITAL WORKS EXPENDITURE

Report prepared by Acting Corporate Services Manager

COUNCIL OFFICER RECOMMENDATION

That the Capital Works Progress Report as at 22nd November 2022 be received and noted.

ALIGNMENT WITH BUSINESS ACTIVITY STRATEGIC PLAN

09 Financially Sustainable

BACKGROUND

Capital Works represents an important part of Councils activities and expenditure. This report details expenditure and progress for the year to date on programmed and emergent capital works.

REPORT

This report is presented for information on the expenditure and progress of Council's Capital Works Program as at 22nd November 2022.

FINANCIAL IMPACT STATEMENT

The recommendation does not impact on Council's financial position.

ATTACHMENTS: Capital Works Progress Report as at 22nd November 2022.

TABLED ITEMS: Nil.

Goldenfields Water County Council CAPITAL WORKS PROGRESS AS AT 22 NOVEMBER 2022	W.O.	ORIGINAL BUDGET 2022/23	2021/2 CARRYOVERS & REVOTES	QBR SEP 2022	QBR DEC 2022	REVISED BUDGET 2022/23	ACTUAL YTD	COMMITTED YTD	TOTAL ACTUAL & COMMITTED YTD	VARIANCE YTD	% ACTUAL TO BUDGET
CAPITAL INCOME:		$	$	$	$	$	$	$	$	$	%
Asset Sales											
Sale of Plant	3100	738,000				738,000	152,945	-	152,945	585,055	21%
Asset Sales		**738,000**	**-**	**-**	**-**	**738,000**	**152,945**	**-**	**152,945**	**585,055**	**21%**
Capital Contributions											
Developer Contributions - Augmentation	3200.200.153	250,000				250,000	65,440	-	65,440	184,560	26%
Developer Contributions - S64	3200.200.280	1,250,000				1,250,000	246,722	-	246,722	1,003,278	20%
West Wyalong Capital Grant	1100.200.270	4,725,000				4,725,000	-	-	-	4,725,000	0%
Capital Contributions		**6,225,000**	**-**	**-**	**-**	**6,225,000**	**312,162**	**-**	**312,162**	**5,912,838**	**5%**
TOTAL CAPITAL INCOME:		**6,963,000**	**-**	**-**	**-**	**6,963,000**	**465,107**	**-**	**465,107**	**6,497,893**	**7%**
CAPITAL EXPENDITURE											
NEW SYSTEM ASSETS:		$	$	$	$	$	$	$	$	$	%
Plant & Equipment											
Plant & Equipment Purchases	3101	1,585,000				1,585,000	301,805	701,404	1,003,209	581,791	63%
Plant & Equipment		**1,585,000**	**-**	**-**	**-**	**1,585,000**	**301,805**	**701,404**	**1,003,209**	**581,791**	**63%**
Information Technology		-							-		
		-				-	-	-	-		
		-				-	-	-	-		
		-				-	-	-	-		
Information Technology		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0%**
Land & Buildings											
New Temora Depot Building	3176	-	100,000			100,000	22,358	87,820	110,178	(10,178)	110%
Land & Buildings		**-**	**100,000**	**-**	**-**	**100,000**	**22,358**	**87,820**	**110,178**	**(10,178)**	**110%**
Mains - Developer Paid	3103	40,000				40,000	-	-	-	40,000	
Coolamon Industrial Subdivision	3160	-	40,000			40,000	64,643	2,268	66,911	(26,911)	
Accommodation Village - Boundary Rd - West Wyalong	3204	-				-	2,802	-	2,802	(2,802)	
Dustin Rose Estate	3206	-	20,000			20,000	5,736	818	6,554	13,446	
Loch St Ganmain	3240					-	18,629	-	18,629	(18,629)	
Mains - Developer Paid		**40,000**	**60,000**	**-**	**-**	**100,000**	**91,810**	**3,086**	**94,896**	**5,104**	**95%**
Mains - Trunk									-		
Bulk Customer Water Quality Panels - Harden Offtake	3106	-	66,000			66,000	-	65,540	65,540	460	99%
Mains - Trunk		**-**	**66,000**	**-**	**-**	**66,000**	**-**	**65,540**	**65,540**	**460**	**99%**
Mains - Reticulation									-		
Oura WTP PRV to customer	3205	-	5,000			5,000	5,067	-	5,067	(67)	101%
Mains - Reticulation		**-**	**5,000**	**-**	**-**	**5,000**	**5,067**	**-**	**5,067**	**(67)**	**101%**
Mains - Rural									-		
Mandamah Stage 2 - 4	1688	-				-	8,361	6,056	14,417	(14,417)	0%
Mains - Rural		**-**	**-**	**-**	**-**	**-**	**8,361**	**6,056**	**14,417**	**(14,417)**	**0%**

Goldenfields Water County Council CAPITAL WORKS PROGRESS AS AT 22 NOVEMBER 2022	W.O.	ORIGINAL BUDGET 2022/23	2021/2 CARRYOVERS & REVOTES	QBR SEP 2022	QBR DEC 2022	REVISED BUDGET 2022/23	ACTUAL YTD	COMMITTED YTD	TOTAL ACTUAL & COMMITTED YTD	VARIANCE YTD	% ACTUAL TO BUDGET
NEW SYSTEM ASSETS (Continued):		**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**$**	**%**
Pump Stations and Bores											
West Wyalong Transfer Pump Station	**3225**	-		400,000		400,000	57,828	121,846	179,674	220,326	45%
Pump Stations and Bores		**-**	**-**	**400,000**	**-**	**400,000**	**57,828**	**121,846**	**179,674**	**220,326**	**45%**
Scada		-				-			-		
Microwave link sites for Scada	**3109**	250,000	430,000			680,000	27,347	215,554	242,900	437,100	36%
Scada		**250,000**	**430,000**	**400,000**	**-**	**1,080,000**	**85,174**	**337,400**	**422,574**	**657,426**	**39%**
Reservoirs		-				-			-		
Wyalong Standpipe Res	**3226**	1,500,000		2,920,750		4,420,750	779,973	4,013,160	4,793,133	(372,383)	108%
Reservoirs		**1,750,000**	**430,000**	**2,920,750**	**-**	**5,100,750**	**807,320**	**4,228,713**	**5,036,033**	**64,717**	**99%**
TOTAL NEW SYSTEM ASSETS:		**3,375,000**	**661,000**	**3,320,750**	**-**	**7,356,750**	**1,294,549**	**5,214,465**	**6,509,014**	**847,736**	**88%**

Goldenfields Water County Council CAPITAL WORKS PROGRESS AS AT 22 NOVEMBER 2022	W.O.	ORIGINAL BUDGET 2022/23	2021/2 CARRYOVERS & REVOTES	QBR SEP 2022	QBR DEC 2022	REVISED BUDGET 2022/23	ACTUAL YTD	COMMITTED YTD	TOTAL ACTUAL & COMMITTED YTD	VARIANCE YTD	% ACTUAL TO BUDGET
RENEWALS:		$	$	$	$	$	$	$	$	$	%
Plant & Equipment											
Water Quality Instrumentation Renewal	1720	-				-	4,641	-	4,641	(4,641)	0%
Containerised Filter Plant	3192	-				-	510	13,745	14,255	(14,255)	0%
New GPS	3217	30,000				30,000	-	-	-	30,000	0%
Plant & Equipment		**30,000**	**-**	**-**	**-**	**30,000**	**5,151**	**13,745**	**18,896**	**11,104**	**63%**
Information Technology		60,000				60,000				60,000	
IT Equipment	3112	-				-	2,043	-	2,043	(2,043)	
Information Technology		**60,000**	**-**	**-**	**-**	**60,000**	**2,043**	**-**	**2,043**	**57,957**	**3%**
Furniture and Office Equipment									-		
Furniture and Office Equipment	3114	5,000				5,000	-	-	-	5,000	0%
Furniture and Office Equipment		**5,000**	**-**	**-**	**-**	**5,000**	**-**	**-**	**-**	**5,000**	**0%**
Land & Buildings						-			-		
Administration Building	1717	50,000				50,000	-	5,100	5,100	44,900	10%
Land & Buildings		**50,000**	**-**	**-**	**-**	**50,000**	**-**	**5,100**	**5,100**	**44,900**	**10%**
Mains - Trunk						-			-		
Thanowring Road Pipeline	1232	2,000,000				2,000,000	-	-	-	2,000,000	0%
Rosehill Pipeline	1234	600,000				600,000	-	-	-	600,000	0%
Trunk Renewals - Budget	3115	600,000		(70,000)		530,000	-	-	-		
Talbingo Lane Pipeline Renewal	3208	-		70,000		70,000	70,435	-	70,435		
Junee and Weethalle Trunk Designs	3148	-				-	35	1,213	1,248		
Trunk Renewals Totals		600,000	-	-	-	600,000	70,470	1,213	71,683	-	12%
PRV Renewals - Budget	3116	30,000				30,000	-	-	-	30,000	0%
Valve Renewals - Budget	3117	100,000				100,000	-	-	-		
Mains Valve Renewals - Oura	3118	-				-	3,025	25	3,050		
Mains Valve Renewals - Jugiong	3119	-				-	2,844	-	2,844		
Mains Valve Renewals - Mt Arthur	3121	-				-	1,428	-	1,428		
Mains Valve Renewals Totals		100,000	-	-	-	100,000	7,298	25	7,323		7%
Mains - Trunk		**3,330,000**	**-**	**-**	**-**	**3,330,000**	**77,768**	**1,238**	**79,006**	**2,630,000**	**2%**

Goldenfields Water County Council CAPITAL WORKS PROGRESS AS AT 22 NOVEMBER 2022	W.O.	ORIGINAL BUDGET 2022/23	2021/2 CARRYOVERS & REVOTES	QBR SEP 2022	QBR DEC 2022	REVISED BUDGET 2022/23	ACTUAL YTD	COMMITTED YTD	TOTAL ACTUAL & COMMITTED YTD	VARIANCE YTD	% ACTUAL TO BUDGET
Mains - Reticulation											
Wyalong Reliability Project Investigation & Design	**1703**	4,000,000		(3,900,000)		100,000	38,562	51,747	90,309	9,691	90%
Water Main Replacement - Beach St Junee	**1727**	-				-	132,538	10,783	143,320	(143,320)	0%
Wyalong Reliability Project Pipeline Construction	**3241**	-		3,900,000		3,900,000	944,702	1,312,824	2,257,525	1,642,475	58%
Coolamon Railway Underbore	**3244**	-				-	3,158	-	3,158	(3,158)	0%
Meter and Taggle Replacements		635,000				635,000	-	-	-		
Urban Meter & Taggle Replacement Program	**3212**						-	164,970	164,970		
Rural Meter and Taggle Replacement Program	**3213**						170,637	(73,206)	97,432		
Meter and Taggle Replacement Totals		635,000	-	-	-	635,000	170,637	91,764	262,402	372,598	41%
Reticulation Renewals	**3123**	1,000,000				1,000,000	-	-	-		
Pine St - West Wyalong Renewal	**3185**	-				-	-	2,273	2,273		
Reticulation Renewals Totals		1,000,000	-	-	-	1,000,000	170,637	94,037	264,674	735,326	26%
Mains - Reticulation		**5,635,000**	**-**	**-**	**-**	**5,635,000**	**1,289,597**	**1,469,390**	**2,758,987**	**2,613,611**	**49%**
Mains - Rural											
PRV Renewals	**3180**	30,000				30,000	133	-	133	29,867	0%
Rural Renewals	**3181**	750,000	180,000			930,000	-	-	-		
Mirroll - Newell Highway Mains Replacement	**3193**	-				-	-	3,890	3,890		
Oura New Connections from Riv Water (50% Contribution)	**3202**	-				-	34,906	-	34,906		
South from Jail Break Inn Junee	**3233**	-				-	76,891	1,955	78,846		
Bygoo Road Replacement - Ardlethan	**3239**	-				-	31,755	-	31,755		
Wombat BT to Young TS Pipeline Upgrade	**3242**	-				-	1,995	-	1,995		
Rural Renewals Totals		750,000	180,000	-	-	930,000	145,548	5,845	151,393	778,607	16%
Mains - Rural		**780,000**	**180,000**	**-**	**-**	**960,000**	**145,681**	**5,845**	**151,525**	**808,475**	**16%**

Goldenfields Water County Council CAPITAL WORKS PROGRESS AS AT 22 NOVEMBER 2022	W.O.	ORIGINAL BUDGET 2022/23	2021/2 CARRYOVERS & REVOTES	QBR SEP 2022	QBR DEC 2022	REVISED BUDGET 2022/23	ACTUAL YTD	COMMITTED YTD	TOTAL ACTUAL & COMMITTED YTD	VARIANCE YTD	% ACTUAL TO BUDGET
Pump Stations and Bores						-			-		
Gantry Crane	**1738**	75,000	59,000			134,000	-	6,000	6,000	128,000	4%
Rosehill Pump Station	**3125**	-	150,000			150,000	56,519	17,694	74,212	75,788	49%
Matong Bore 2 Switchboard Renewal	**3228**	-				-	-	56,215	56,215	(56,215)	0%
Lonsdale Control Panel	**3247**	-			46,000	46,000	-	25,366	25,366	20,634	55%
Temora WPS SB Upgrade - Oura	**1662**	-				-	5,033	7,518	12,551	(12,551)	0%
Oura Bore 6 Renewal	**1694**	-				-	41	7,509	7,551	(7,551)	0%
Pump and Electrical Renewals - GWCC Wide - Budget	**3126**					-	69	-	69	(69)	0%
Valve Renewals - Budget	**3127**	25,000				25,000	-	-	-		
Critical Valve Renewal	**1730**	-				-	16	-	16		
Pump Station Valve Renewals - Oura	**3128**	-				-	2,645	-	2,645		
Pump Station Valve Renewals - Jugiong	**3129**	-				-	7,280	-	7,280		
Pump Station Valve Renewals - Mt Arthur	**3131**	-				-	89	-	89		
Pumping Stations Valve Renewals Totals		25,000	-	-	-	25,000	10,030	-	10,030	14,970	40%
Oura Bore 4	**3133**	-				-	5,298	-	5,298	(5,298)	
Oura Bore 4 - Emergency Bore Reline	**3189**	-	250,000			250,000	396,825	250	397,075	(147,075)	
Oura Bore 4 Totals		-	250,000	-	-	250,000	402,124	250	402,374	(152,374)	161%
Ariah Park Pump Station Investigation	**3158**	400,000	20,000			420,000	6,115	-	6,115	413,885	1%
Oura Pump Station Renewal	**3218**	75,000				75,000	8,676	-	8,676	66,324	12%
Jugiong Raw water well Renewal	**3219**	100,000				100,000	2,390	-	2,390	97,610	2%
Pump Station - Mech (pump renewals/rebuilds)	**3223**	100,000				100,000	-	-	-	100,000	
Pump Station - Elec (Electrical Items, SBs, etc)	**3224**	420,000				420,000	-	-	-	420,000	
Jugiong Raw Water PS Renewal	**3209**	-				-	6,503	4,379	10,883	(10,883)	
Talbingo Pump 1	**3215**	-				-	1,568	439	2,007	(2,007)	
Ganmain Pump Station Switchboard Renewal	**3229**	-				-	895	33,928	34,823	(34,823)	
Ganmain Pump 8 - 2022	**3234**	-				-	10,364	-	10,364	(10,364)	
Eurollie Pump 2 - 2022	**3235**	-				-	8,062	-	8,062	(8,062)	
Junee Reefs Magflow Install - 2022	**3236**	-				-	34,039	-	34,039	(34,039)	
Demondrille Pump 2 - 2022	**3237**	-				-	23,270	50	23,320	(23,320)	
Jugiong CWPS1 Pump 1 - 2022	**3238**	-				-	11,901	154,065	165,967	(165,967)	
Temora Transfer Pump 1 - 2022	**3243**	-				-	1,822	-	1,822	(1,822)	
Marinna Pump 2 - 2022	**3245**	-				-	574	-	574	(574)	
Jugiong CWPS1 P1 and P2 Inlet Manifold 2022	**3246**	-				-	47,526	23,694	71,220	(71,220)	
Pumping Station Renewals/Rebuilds etc Totals		520,000	-	-	-	520,000	146,523	216,555	363,078	156,922	70%
Pump Stations and Bores		**1,195,000**	**479,000**	**-**	**46,000**	**1,720,000**	**637,520**	**337,107**	**974,627**	**745,373**	**57%**

Goldenfields Water County Council CAPITAL WORKS PROGRESS AS AT 22 NOVEMBER 2022	W.O.	ORIGINAL BUDGET 2022/23	2021/2 CARRYOVERS & REVOTES	QBR SEP 2022	QBR DEC 2022	REVISED BUDGET 2022/23	ACTUAL YTD	COMMITTED YTD	TOTAL ACTUAL & COMMITTED YTD	VARIANCE YTD	% ACTUAL TO BUDGET
Reservoir Sites											
Oura Reservoirs and aerator	**3183**	3,000,000	300,000		(60,000)	3,240,000	166,472	164,801	331,273	2,908,727	10%
Wombat BT Renewal	**3203**	-				-	1,642	20,609	22,251	(22,251)	
Grong Grong Reservoir Switchboard Renewal	**3221**	-					-	17,081	17,081	(17,081)	
Coolamon South Reservoir Switchboard Renewal	**3222**	-				-	-	17,081	17,081	(17,081)	
Matong Reservoir Switchboard Renewal	**3231**	-				-	-	16,077	16,077	(16,077)	
Internal Adhoc Renewals	**3134**	50,000				50,000	49,496	99	49,595	405	
External Adhoc Renewals	**3135**	100,000	263,000			363,000	307,949	14,150	322,099	40,901	
Full Renewal	**3182**	1,000,000				1,000,000	-	-	-	1,000,000	
Switchboard Renewals	**3220**	75,000				75,000	-	-	-	75,000	
Storage Shed located at Oura Approx. 18 x 16m	**3249**	-			60,000	60,000	-	-	-	60,000	
Renewals Totals		1,225,000	263,000	-	-	1,488,000	359,087	85,098	444,184	1,043,816	30%
Reservoir Sites		**4,225,000**	**563,000**	**-**	**-**	**4,788,000**	**525,559**	**249,899**	**775,458**	**4,012,542**	**16%**
Treatment Plant											
Jugiong PLC Upgrade	**1653**	-				-	27,616	-	27,616	(27,616)	0%
Oura High Voltage	**1660**	-	650,000			650,000	517,922	-	517,922	132,078	80%
Jugiong Compressor	**1728**	-				-	1,093	-	1,093	(1,093)	0%
Jugiong High Voltage	**3137**	4,000,000	330,000			4,330,000	1,235,572	2,527,207	3,762,780	567,220	87%
Internal Adhoc Renewals	**3139**	30,000				30,000	69	-	69	29,931	0%
Jugiong WTP - Valve & Pneumatic Upgrade	**3186**	-				-	21,287	31,291	52,578	(52,578)	0%
Jugiong Raw Water Well Renewal	**3199**	-	40,000			40,000	-	-	-	40,000	0%
Treatment Plant		**4,030,000**	**1,020,000**	**-**	**-**	**5,050,000**	**1,803,560**	**2,558,498**	**4,362,059**	**687,941**	**86%**
Emergency Works											
Emergency Works - Budget	**3140**	200,000				200,000	(7,340)	90,509	83,169	116,831	42%
Emergency Works		**200,000**	**-**	**-**	**-**	**200,000**	**(7,340)**	**90,509**	**83,169**	**116,831**	**42%**
TOTAL RENEWALS ASSETS:		**19,540,000**	**2,242,000**	**-**	**46,000**	**21,828,000**	**4,479,538**	**4,731,331**	**9,210,869**	**12,542,210**	**42%**
TOTAL CAPITAL EXPENDITURE:		**22,915,000**	**2,903,000**	**3,320,750**	**46,000**	**29,184,750**	**5,774,087**	**9,945,796**	**15,719,883**	**13,389,945**	**54%**

GOLDENFIELDS WATER COUNTY COUNCIL – DECEMBER 2022

DEBT RECOVERY

Report prepared by Corporate Services Manager

COUNCIL OFFICER RECOMMENDATION

That the Board receives and notes the update on Debt Recovery.

ALIGNMENT WITH BUSINESS ACTIVITY STRATEGIC PLAN

09 Financially Sustainable

BACKGROUND

From March 2021, Goldenfields Water recommenced debt recovery processes to collect overdue monies owed for water accounts. Debt recovery processes include the restriction / disconnection of properties and referral to external debt recovery agents.

REPORT

Outstanding water debtors as at 9 November 2022:

	Arrears	Interest	Current	Total
Water Billing Debtors	$796,859	$70,607	$1,756,829	$2,624,295
Less:				
Bulk Councils				$167,878
Developer Charges				$254,137
Total Retail Customers				$2,202,280

Debt recovery action figures for the period June 2022 to mid-November 2022:

NOTICES ISSUED	No. Customers	Outstanding Account ($)
Final Notice (Bill period 2022 Q4)	1734	$1,071,894.94
Debt Recovery Action:		
Pending Restriction Notice	83	$198,946.59
Restriction Warning Card	21	$59,263.25
Physical Restriction / Disconnection	20	$26,196.14
Total Payments Received (following Debt Recovery Action)		$78,509.46
RESTRICTION DETAILS0		
Properties paid prior to restriction	42	$61,742.58
Properties Unrestricted	10	$18,410.56
Properties Remaining Restricted	10	$22,607.78
Properties Referred to Debt Recovery Agent	22	$87,254.46

FINANCIAL IMPACT STATEMENT

The recommendation does not impact on Council's financial position.

ATTACHMENTS: Nil

TABLED ITEMS: Nil

GOLDENFIELDS WATER COUNTY COUNCIL – DECEMBER 2022

AUDIT RISK AND IMPROVEMENT COMMITTEE

Report prepared by Corporate Services Manager

COUNCIL OFFICER RECOMMENDATION

That the Board receives and notes the minutes of the Audit, Risk and Improvement Committee meeting held on 18 November 2022

ALIGNMENT WITH BUSINESS ACTIVITY STRATEGIC PLAN

Priority 2 Customer Service Focus

BACKGROUND

Goldenfields Water County Council Audit, Risk and Improvement Committee is an advisory committee in accordance with section 355 of the Local Government Act 1993, and the Local Government Regulations 2012. The Committee was established by Council Res 17/008 on 23 February 2017. In accordance with the Audit, Risk and Improvement Committee Charter, the Committee will report regularly to Council.

REPORT

The Goldenfields Water County Council Audit, Risk and Improvement Committee met on 18 November 2022. Minutes of the meeting are attached for the information of the Board.

FINANCIAL IMPACT STATEMENT

The recommendation does not impact on Council's financial position.

ATTACHMENTS: Minutes of ARIC Meeting 18-11-2022

TABLED ITEMS: Nil.

Goldenfields Water

ARIC Meeting Minutes

Meeting Ref. ARIC		Minute taker: John Chapman
Date: 18 November 2022	Time: 2pm	Location: Teams Online Meeting OR 84 Parkes Street, Temora (Board Room)
Attendees: Peter McLean (Chairperson Via Teamviewer), Geoff Twomey, Cr Bob Callow (Via Teamviewer), Aaron Drenovski, John Chapman, Annie Coleman, Jason Gilbert (Crowe – via Teamviewer)		
Apologies: Cr Matthew Stadtmiller, Phil Swaffield (National Audits Group), Nirupama Mani (NSW Audit Office)		

1. Welcome and Apologies

The meeting was opened at 2:00pm. Apologies received from Cr Matthew Stadtmiller, Phil Swaffield (National Audits Group), Nirupama Mani (NSW Audit Office).

The Chairman acknowledged the Traditional Custodians of the land, and paid respects to their Elders past and present.

2. Declarations of Pecuniary and Non-Pecuniary Interests

No pecuniary or non-pecuniary interests were declared.

3. Confirmation of Previous Minutes

RECOMMENDATION on the motion of Cr Bob Callow and Geoff Twomey that the minutes of the meeting held 1 September 2022 having been circulated to members be confirmed as a true and accurate record.

4. Business Arising from Minutes

The matter of insurance claims after natural disasters was again raised, given the current situation with record floods eastern Australia. Future impacts on insurance cover and premiums was discussed. Reassessment of risk and insurance cover will be a major issue for local government authorities in the near future.

Goldenfields Water

5. Chairperson Report

RECOMMENDATION on the motion of Geoff Twomey and Cr Bob Callow that the Committee received and noted the Chairperson's verbal report.

- **Insurance Cover – Natural Disasters**
  - Reassessment of risk and insurance cover will be a major issue for local government authorities in the near future, given the current flooding issues.
- **ICAC reports:**
  - Current investigation into pork barreling (Operation Jersey)
  - IVAC investigating alleged conflict of interest at Dendenong Council
  - Victorian Audit Office undertaking project performance reviews
- **Federal Department of Home Affairs** - looking at management of assets from a risk perspective.
- **Staffing Issues** – many local and state government authorities experiencing difficulties in recruitment of suitable qualified staff (not evident at GWCC).

6. General Manager Report

RECOMMENDATION on the motion of Geoff Twomey and Cr Bob Callow that the Committee received and noted the General Manager's verbal report.

- **Staff** – Genevieve Taylor appointed to the position of Accountant.
- **Major Projects** - West Wyalong project going well – contractors experiencing issues with the cost of accommodation.
- **Wet weather** – continues to cause delays in progress with other projects.
- **Energy Contract** – staff currently monitoring markets and exploring the potential for an extension of the current contract (expiring on 31 December 2022).

7. Audited Financial Statements

RECOMMENDATION on the motion of Geoff Twomey and Cr Bob Callow that the committee Review the 2021/22 Financial Statements.

Jason Gilbert (Crowe) addressed the meeting with a focus on the Closing Report issued by the NSW Audit Office. Matters raised included:

- ICT policies and strategy scheduled for completion by December 2022
- Timing of capitalisation of assets
- Asset revaluations
- Acceptable operating result, consistent with last year
- Cash and investments adequate
- Own Source Revenue ratio above the Office of Local Government benchmark
- Debt Recovery Ratio can be misleading as utility billing for consumption for the quarter to June is processed in July with payments due in mid-August. Updated ratio for 31 August to be reported at next ARIC meeting.
- All other ratios generally within benchmark
- Significant capital investment continuing
- Interest on investments income affected by low interest rates
- Insurance rebates

Goldenfields Water

8. ARIC Meeting Dates 2023

RECOMMENDATION on the motion of Geoff Twomey and Cr Bob Callow that the committee endorse the following ARIC meeting dates for 2023:

- 10am Thursday 23 February 2023
- 10am Thursday 25 May 2023
- 10am Thursday 27 July 2023
- 10am Thursday 28 September 2023 – 2022/23 Financial Statements

9. Internal Audit 2022/23 Engagements

The internal audits included in the 2022/23 Annual Work Program are:

- New Connections
- Water Supply and Demand Monitoring
- Work Health and Safety

It is anticipated that the Work Health and Safety audit will be undertaken in early 2023, with a report to be presented to the February 2023 ARIC meeting.

NEXT MEETING: 10am Thursday 23 February 2023

There being no further matters requiring the attention of the committee the meeting was declared closed at 3:12pm.

GOLDENFIELDS WATER COUNTY COUNCIL – December 2022

WATER PRODUCTION REPORT

Report prepared by Production and Services Manager

COUNCIL OFFICER RECOMMENDATION

That the Water Production Report be received and noted.

ALIGNMENT WITH BUSINESS ACTIVITY STRATEGIC PLAN

Priority 3 A Healthy Natural Environment

BACKGROUND

Goldenfields Water provides the essential water requirements of about 40,000 people spread over an area in excess of 20,000 square kilometres between the Lachlan & Murrumbidgee Rivers in the South West of NSW.

Goldenfields Waters' supply system consists of five separate water schemes, Jugiong, Oura, Mt Arthur, Mt Daylight and Hylands Bridge. Goldenfields Water carries out water supply functions within the Local Government areas of Bland, Coolamon, Cootamundra, Hilltops, Junee, Temora, and parts of Narrandera and Wagga Wagga.

Hilltops Shire Council, Cootamundra Gundagai Shire Council and Riverina Water County Council are retailers, who purchase bulk water from Goldenfields and supply the water to retail customers in their respective local government areas.

REPORT

Jugiong drinking Water Scheme

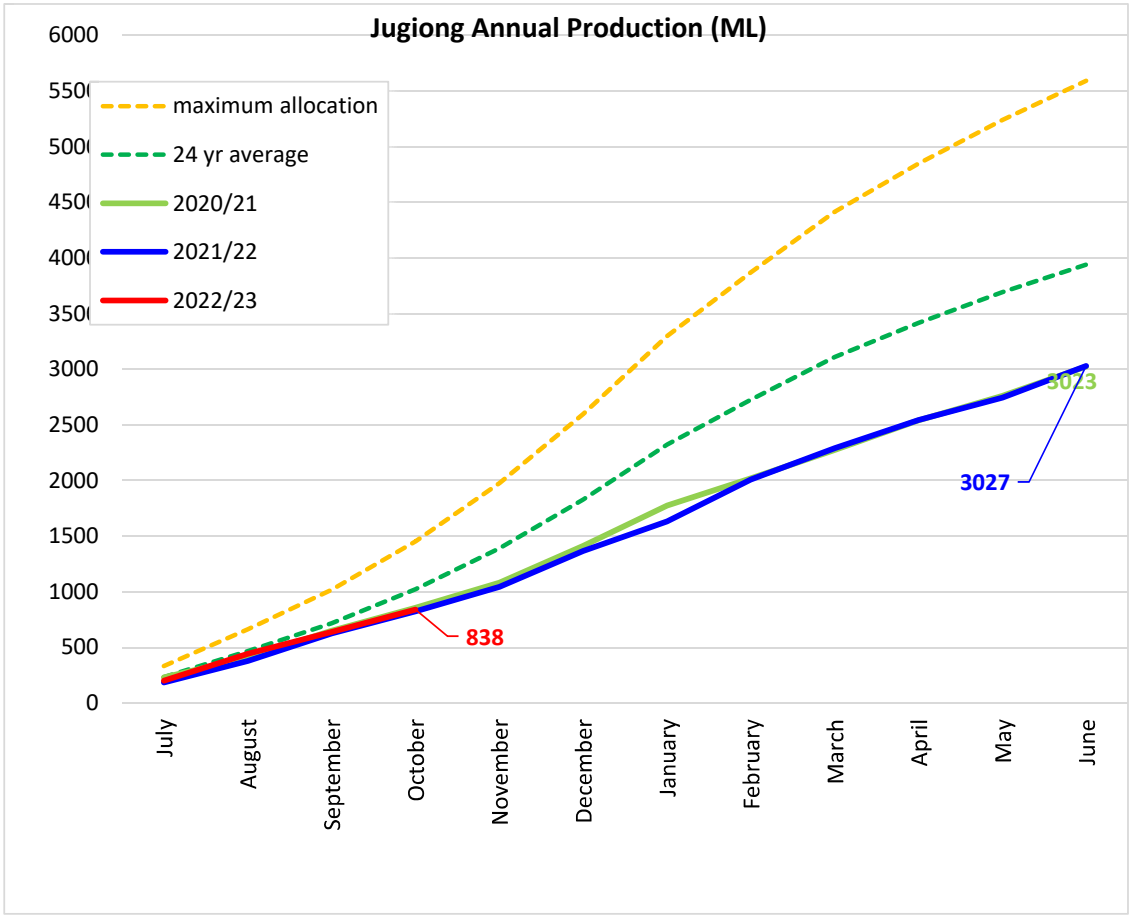
The Jugiong drinking water scheme sources water from the Murrumbidgee River and has an extraction licence entitlement of 5590ML per annum. Water from the Murrumbidgee River is treated through a 40ML/day, conventional Water Treatment Plant that consists of: Coagulation, Flocculation, Clarification, Filtration, Disinfection and Fluoridation.

The Jugiong Scheme has 14 sets of reservoirs and 8 pumping stations. The Jugiong Scheme supplies bulk water to the Hilltops and Cootamundra-Gundagai Regional Councils for supply to the townships of Cootamundra, Harden and Young with a population of approximately 6800, 2200 and 8000 respectively.

Goldenfields Water also provides additional retail supply to approximately 600 customers in the villages of Stockinbingal, Wallendbeen and Springdale.

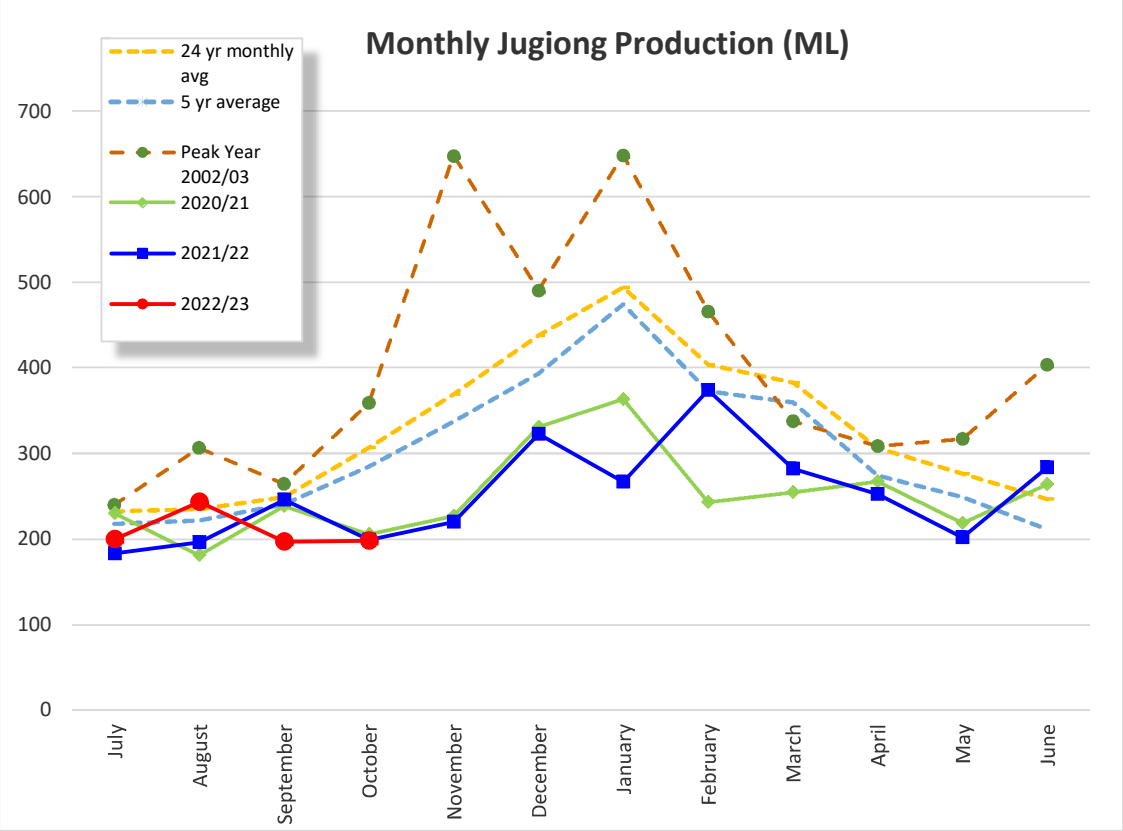
GOLDENFIELDS WATER COUNTY COUNCIL – December 2022

For the first 4 months of the 2022/23 financial year, 838ML of water had been extracted from the Murrumbidgee River and processed at the Jugiong Water Treatment plant. This is slightly higher than the same period in the 2021/22 FY where 823ML was extracted. An increase of 15ML. This is illustrated in the graph below.



GOLDENFIELDS WATER COUNTY COUNCIL – December 2022

Jugiong monthly production started slightly higher in July with 199ML extracted and treated for the month. August seen a further increase in production with 243ML extracted and treated before a decrease in production for September where only 197ML was extracted and treated. October 2021 and October 2022 seen an extraction of 198ML with no increase or decrease for October. This decrease in overall production for 2022/23 coincides with a very wet start to Spring.



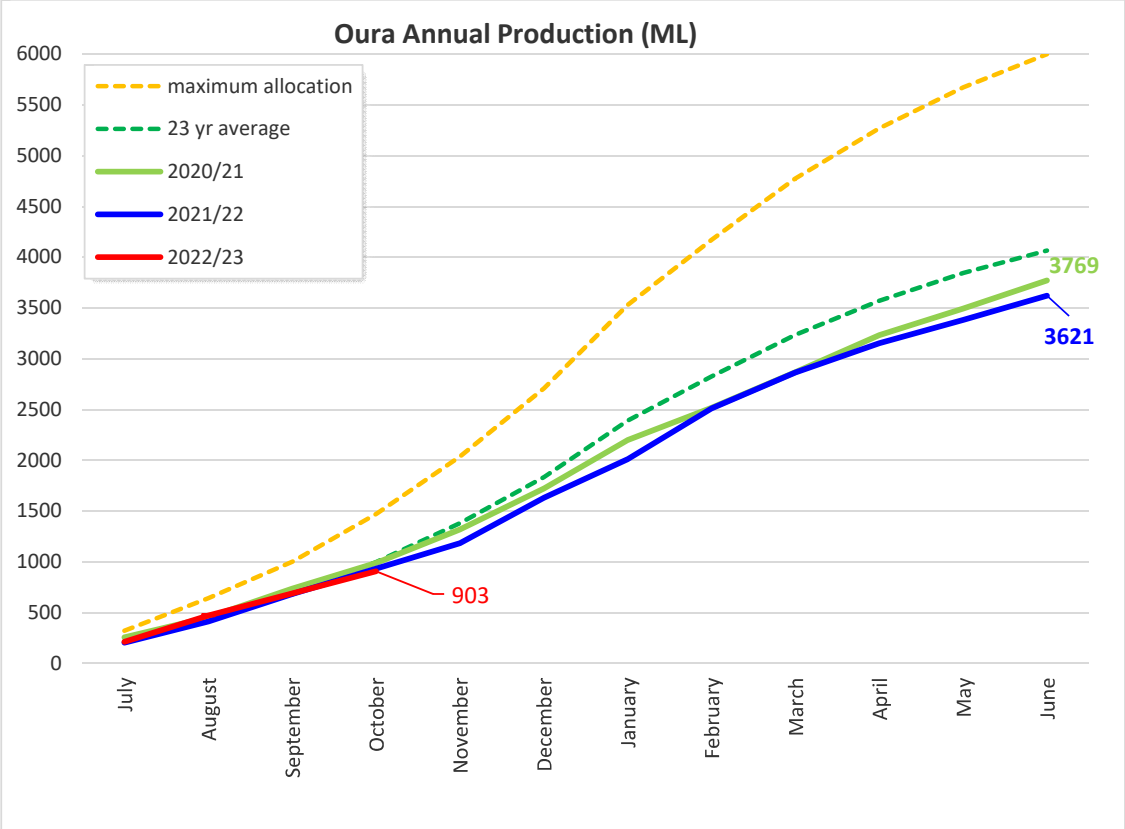
GOLDENFIELDS WATER COUNTY COUNCIL – December 2022

Oura Drinking Water Scheme

The water source at Oura is the Murrumbidgee inland alluvial aquifer, this water is extracted from 4 bores namely: Bores 2, 3, 4 and 6. The raw water then goes through a treatment process at the Oura Water Treatment Plant that includes Aeration, Disinfection and Fluoridation.

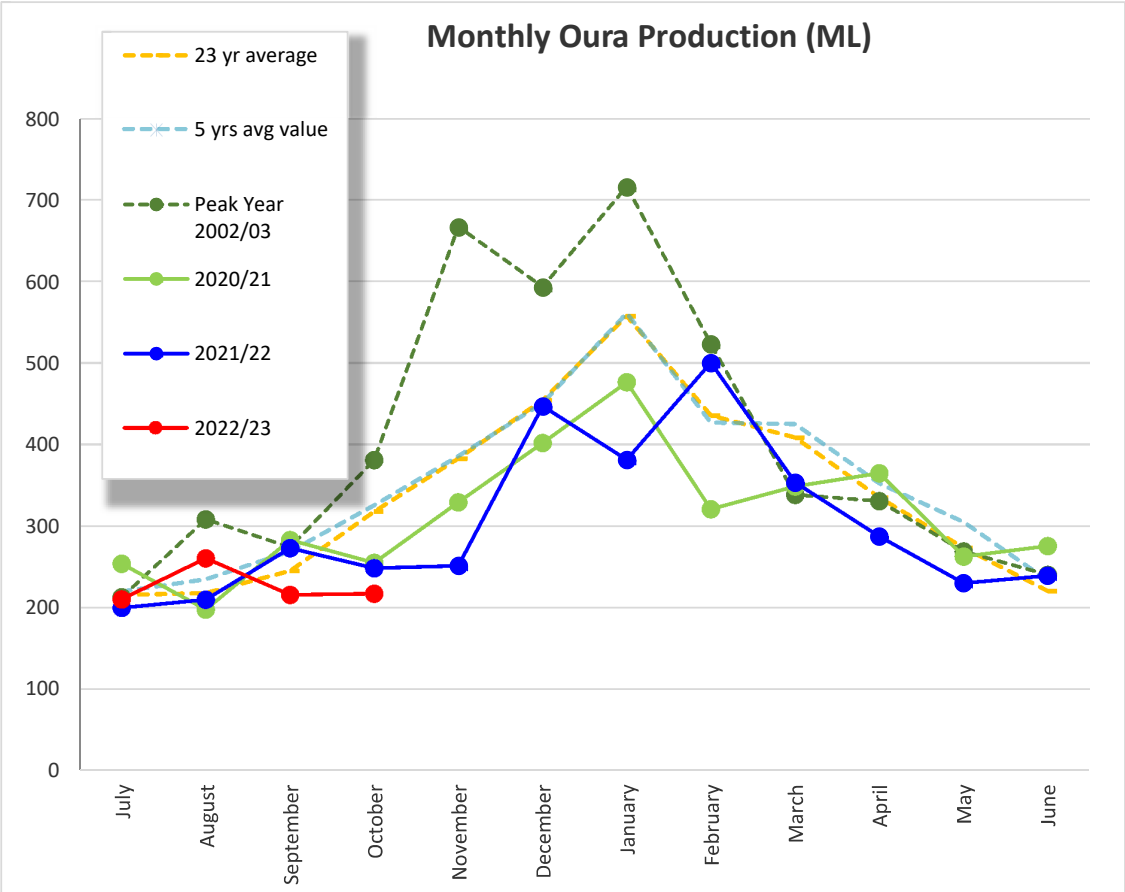
The Oura scheme has 33 sets of reservoirs and 19 pumping stations, produces drinking water for approximately 14,600 people in the Bland, Coolamon, Junee, Narrandera and Temora Shires. The Oura scheme can also supply water to the Northern side of the rural area of Wagga Wagga City when required.

For the first 4 months of the 2022/23 financial year, 903ML of water has been extracted from the Oura Borefield and processed at the Oura Water Treatment Plant. This is a slight decrease in production compared to last FY where 931ML was extracted for the same period. A decrease in production of 28ML. This is depicted in the graph below.



GOLDENFIELDS WATER COUNTY COUNCIL – December 2022

Oura monthly water production has started slightly higher in July where 200ML was extracted from the Oura bores in July. August seen an increase in production where 260ML was extracted before a decrease in production for September seen only 215ML extracted. October seen a further decrease where only 217ML was extratcted, this decrease can be attributed to a wet start to spring.

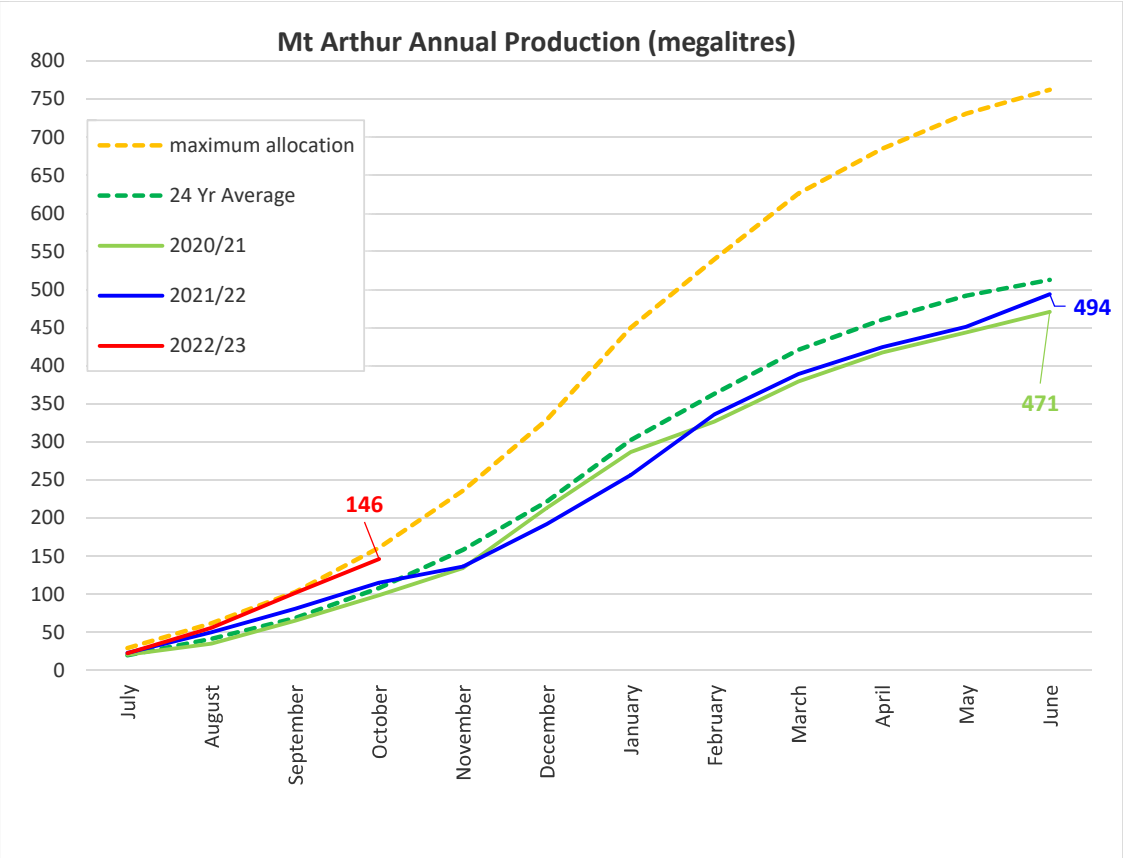


GOLDENFIELDS WATER COUNTY COUNCIL – December 2022

Mount Arthur Drinking Water Scheme

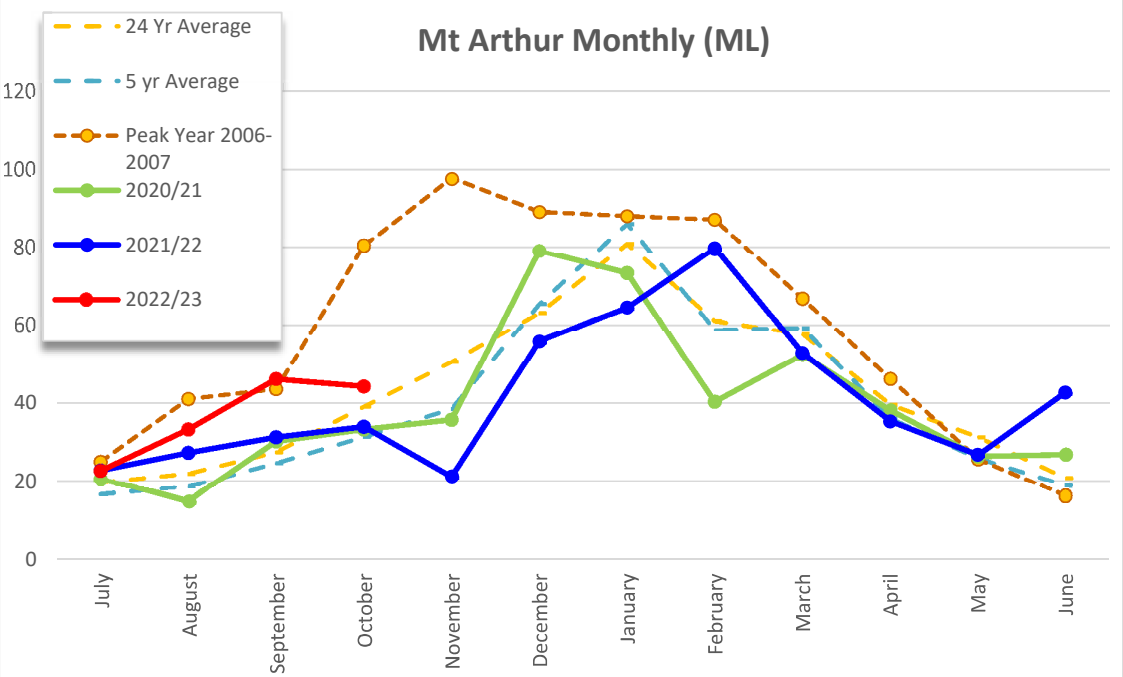
The Mount Arthur Water Source is from the Lachlan Fold belt Aquifer System. The water is extracted via two bores, bores 1 and 2 located in the Wagga Wagga City Council area South of Matong. The water is disinfected before distribution through 9 sets of reservoirs supplying approximately 2400 people with water in the Coolamon shire.

For the first 4 months of the 2022/23 financial year, 146ML of water has been extracted from the Mt Arthur Borefield. This is an increase compared to last FY where 115ML was extracted from the Mt Arthur bores for the same period. An increase of 31ML. As can be seen in the graph below trending slightly higher to previous years.



GOLDENFIELDS WATER COUNTY COUNCIL – December 2022

Mt Arthur monthly water production started very consistently to previous years with 23ML of water extracted from the bores in July before a significant increase in the following 2 months, August seen 33ML extracted and September a further increase to 46ML. This increase indicates a leak within the system however, finding it was difficult with the wet catchment which has exacerbated the production data until the leak was found and fixed. October seen a slight decrease with 44ML extracted from the Mt Arthur Bores.

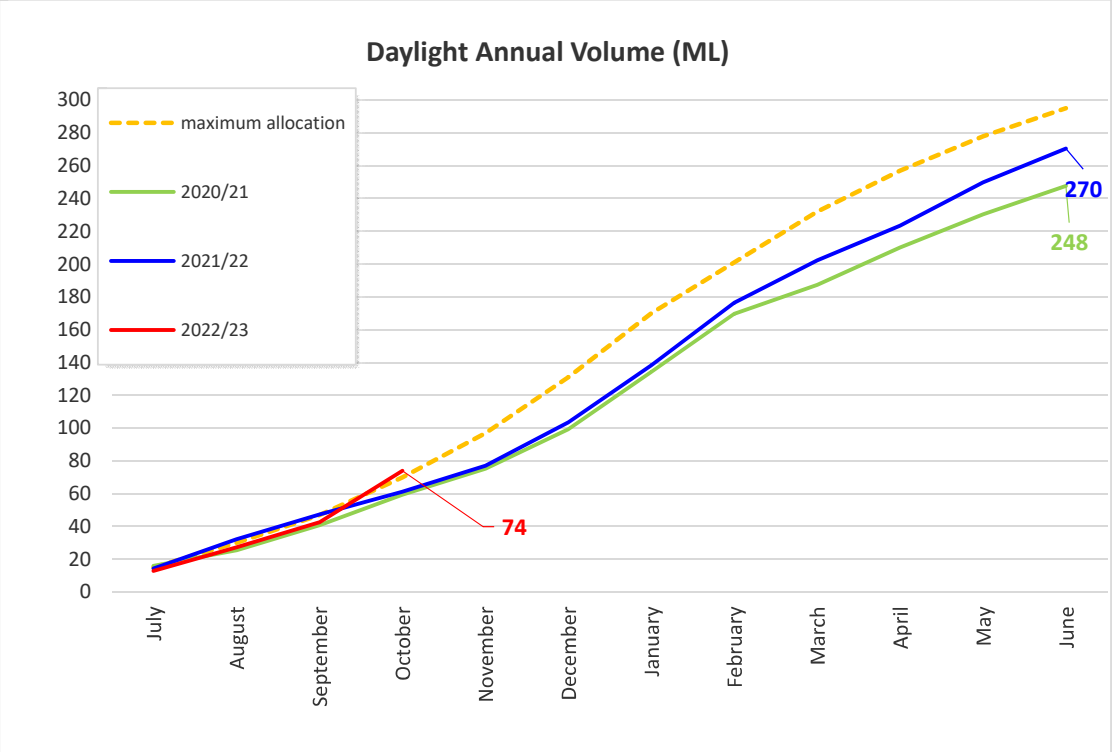


GOLDENFIELDS WATER COUNTY COUNCIL – December 2022

Mount Daylight Drinking Water Scheme

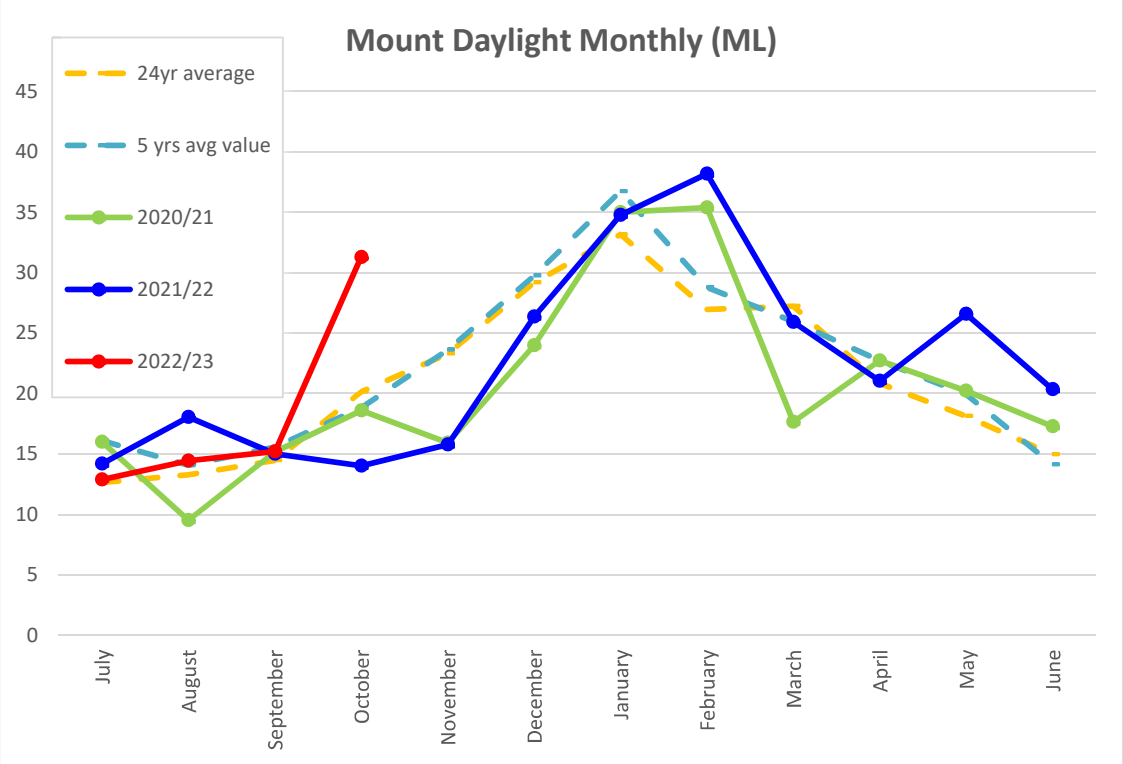
The Mount Daylight water source is from the Lower Lachlan alluvium aquifer. The Mount Daylight bores are jointly operated with Carathool Shire Council. Carathool Shire Council is responsible for bore management. There are 7 sets of reservoirs in the Mt Daylight scheme. Mt Daylight supplies water to approximately 125 people in the villages of Naradhan, Weethalle and Tallimba which is located within the Bland Shire.

For the first 4 months of the 2022/23 financial year, 74ML of water has been extracted from the Mt Daylight Borefield. This is an increase in volume of 13ML compared to the 2021/22 FY where 61ML was produced over the same period. This steep increase indicates that a burst was evident in the scheme, interrogation of ClearSCADA pump run times indicates a pump had run for a long period of time also indicating a burst in the scheme. The burst was located on Harts Lane within the Mt Daylight scheme, again prolonged wet weather mad it difficult to access and locate the burst.



GOLDENFIELDS WATER COUNTY COUNCIL – December 2022

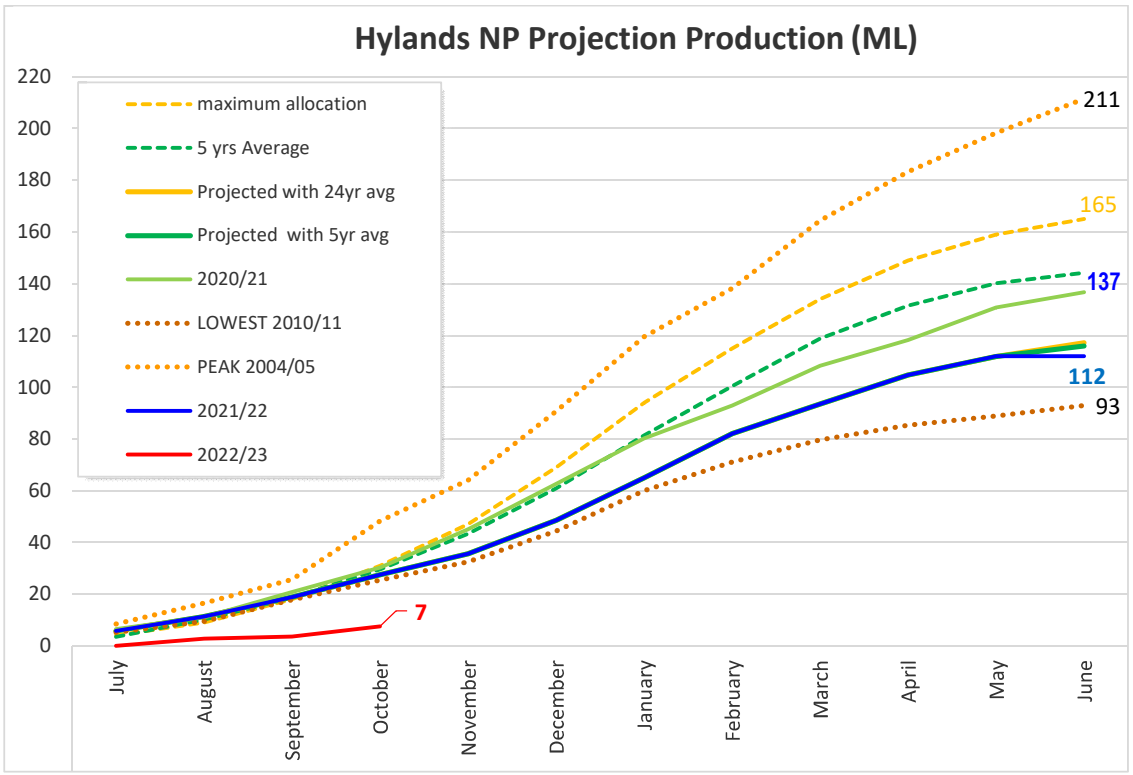
The monthly extraction totals for the Mt Daylight bores have started very consistently with July seeing 13ML extracted with slight increases in August 14ML, September was steady with15ML extracted before a dramatic increase for October where 31ML was extracted, as indicated this increases correlates to a burst in the system which has now been located and fixed.



Hylands Bridge - Non Potable

Hylands Bridge supplies Non Potable water to Barellan and Binya. The water is sourced through the Murrumbidgee Irrigation Area where Goldenfields Water holds 165ML shareholding for water entitlement.

For the first 4 months of the 2022/23 financial year only 7ML of water has been extracted from the Hylands Bridge Raw Water scheme. The reduction in production from Hylands Bridge was attributed to the channel undergoing maintenance and extraction not occurring. The system operates on storage during this time.



FINANCIAL IMPACT STATEMENT

The recommendation does not impact on Council's financial position.

ATTACHMENTS: Nil

TABLED ITEMS: Nil

GOLDENFIELDS WATER COUNTY COUNCIL – DECEMBER 2022

DRINKING WATER MANAGEMENT SYSTEM ANNUAL REPORT

Report prepared by Production & Services Manager

COUNCIL OFFICER RECOMMENDATION

a. That the Board note and adopt the updated Drinking Water Management System (DWMS).
b. That the Board note and adopt the DWMS Policy without changes
c. That the Board note and adopt the DWMS Annual Report for 2021/22 reporting year.

ALIGNMENT WITH BUSINESS ACTIVITY STRATEGIC PLAN

Priority 1 High Quality, Secure and Efficient Water Supplies

BACKGROUND

Goldenfields Water has developed and implemented a Drinking Water Management System (DWMS) and Policy since 2017. This report provides the community and Board with an annual review of that system.

REPORT

The purpose of the DWMS Annual Report is to inform and update New South Wales Department of Health (NSW Health) of Goldenfields Water County Councils (GWCC) implementation and ongoing assessment of its Drinking Water Management System. It also demonstrates that GWCC is compliant with requirement s25 Public Health Act 2010 to develop a Quality Assurance Program (QAP) in line with the framework for Drinking Water Quality Management in the Australian Drinking Water Guidelines.

Throughout the reporting period GWCC have undertaken numerous water samples for both operational and verification monitoring. These samples are tested at the GWCC laboratory or an external NATA accredited laboratory for operational monitoring or NSW Health's FASS lab for verification or compliance purposes. GWCC also conducted a number of onsite tests for operational purposes which are presented below.

Water samples are tested for Physical, Chemical and Microbial properties in the water.

Throughout the reporting period GWCC have conducted a total of 1296 microbial water samples to be either tested by NSW Health or tested 'in-house' by GWCC Water Quality staff.

The New South Wales Health Drinking Water Monitoring Program outlines the number and allocation of samples within a Drinking Water System. These numbers are based on population served and the complexity of the system. Currently GWCC have 438 water samples tested by FASS for E.coli and Faecal Coliforms across the entire drinking water scheme. These numbers can be further broken down into water supply systems:

- Jugiong Drinking Water Scheme 78 samples annually for E.coli and Faecal Coliforms
- Oura Drinking Water Scheme 270 samples annually for E.coli and Faecal Coliforms
- Mount Arthur Drinking Water Scheme 64 samples annually for E.coli and Faecal Coliforms
- Mount Daylight Drinking Water Scheme 26 samples annually for E.coli and Faecal Coliforms

There were 3 non-compliant samples for the reporting year which were resulted within the Jugiong scheme at our rural reservoirs located at the extremities of the system. These reservoirs do not provide town water supply however service rural connections. When non-conforming sample is identified, staff investigate, manually dose liquid chlorine and retest the system to ensure the system gets back under control. All retests for these breaches resulted in compliant tests.

The drinking water is also tested throughout the period for chemical elements which may be present in the water, a total of 186 water samples were carried out during the reporting period, and all were tested by NSW Health's FASS laboratory. From the 186 total samples collected and tested, 116 were treated water samples taken in the distribution system and 70 were raw or bore water samples.

GWCC also undertake pesticide sampling of the drinking water across the entire scheme. These samples are tested by a NATA accredited laboratory for the 2021/22 FY a total of 14 samples were tested for the presence of pesticides. All sample results were compliant with parameters set in the ADWGs.

It is also a requirement for GWCC to test for Radiological characteristics in the ground water supplies every 2 years, for the 2021/22 FY 4 Radiological samples were taken and tested by Australian Nuclear science and Technology Organisation (ANSTO).

Another initiative undertaken by GWCC is the monitoring of chlorine within the distribution system networks across the entire drinking water scheme. These tests are conducted routinely by the distribution staff and a total of 3165 chlorine test were conducted onsite throughout the year. These tests include both Total and Free chlorine. Since the implementation of councils water quality database, WaterOutlook, there has been 7375 chlorine test results uploaded into the database. The below table provides a list of exceedances with the ADWG from chemical sampling. Please note that fluoride results of exceedance are due to lower than required amounts which occur when dosing equipment fails. In addition to this the 7 results within the Mt Arthur scheme are simply due to the scheme not being a fluoridated system is found to have <1mg/l found.

Site	Indicator Non-Compliant							
	Selenium	Iron	Manganese	Colour	Turbidity	pH	Fluoride	Lead
Distribution – Oura Scheme			1			2	19	1
Distribution – Jugiong Scheme			1					
Distribution – Mt Arthur Scheme		1				1	7*	

The following tables provide the total number of Critical Control Point (CCP) exceedances registered throughout the 2021/22 financial year with the corresponding CCP number.

Jugiong	CCP1	CCP2	CCP3	CCP4	CCP5	CCP6
Number of CCP exceedances	0	0	0	7	0	0

Oura	CCP1	CCP2	CCP3	CCP4	CCP5	CCP6
Number of CCP exceedances	1	30	0	0	0	0

Mt Daylight	CCP1	CCP2	CCP3	CCP4	CCP5	CCP6
Number of CCP exceedances	3	0	0	0	0	0

The below table provides a definition as to what the CCP number correlates to in terms of indicates measured. As you will note a majority of these breaches are related to fluoride equipment failure and chlorine equipment failure. Validation monitoring is undertaken when a breach occurs providing staff confidence that the failed result was due to equipment failure/calibration issues rather than an actual serious breach.

CCP Number	Monitoring Parameter	Target Criterion	Adjustment Limit	Critical Limit
1 - Jugiong	Turbidity (Continuous online) Raw Water	Dependant on raw Water Quality		20% above set point for > 20minutes
2 - Jugiong	Turbidity (Continuous online) Filter Outlet	≤ 0.2 NTU	≥ 0.5 NTU	≥ 1.0 NTU
3 - Jugiong	Free Chlorine residual (Continuous online & alarmed) Finished Water	1.8mg/L	≤ 1.2mg/L or ≥ 2.0mg/L	**Summer**: ≤ 0.8mg/L for > 30min or ≥ 5.0mg/L **Winter**: ≤ 0.5mg/L for > 30min or ≥ 5.0mg/L
4 - Jugiong	Fluoride (Daily) Finished Water	1.0mg/L	< 0.95mg/L or > 1.05mg/L	< 0.9mg/L for > 72hrs or > 1.5mg/L
5 - Jugiong	System Integrity (monthly) Reservoir inspection	Secure, no evidence of break in or vermin	Visual identification of breach or vermin access to reservoir	Visual identification of vermin or containment in reservoir
6 - Jugiong	Free chlorine residual (continuous online & alarmed) Prunevale and Cootamundra	0.8mg/L	≤ 0.5mg/L or ≥ 2.0mg/L	≤ 0.2mg/L or ≥ 5.0mg/L
1 - Oura	Free Chlorine residual (Daily) Treated Water	0.5mg/L	≤ 0.3mg/L or ≥ 1.0mg/L	≤ 0.2mg/L or ≥ 5.0mg/L

2 – Oura	Fluoride (Daily) Treated Water	1.0mg/L	< 0.9mg/L or > 1.2mg/L	< 0.9mg/L for > 72hrs or ≥ 1.5mg/L
3 – Oura	System Integrity (monthly) Reservoir inspection	Secure, no evidence of break in or vermin	Visual identification of breach or vermin access to reservoir	Visual identification of vermin or containment in reservoir
4 - Oura	Chlorine Residual (weekly) Wyalong and Thanowring Rd	0.5mg/L	≤ 0.35mg/L	≤ 0.25mg/L
1 – Mt Arthur	Free Chlorine residual (3 x weekly) Tank 4 Outlet	0.8mg/L	≤ 0.5mg/L or ≥ 2.0mg/L	≤ 0.3mg/L or ≥ 5.0mg/L
2 – Mt Arthur	System Integrity (monthly) Reservoir inspection	Secure, no evidence of break in or vermin	Visual identification of breach or vermin access to reservoir	Visual identification of vermin or containment in reservoir
1 – Mt Daylight	Free Chlorine Residual (continuous Online) Naradhan Reservoir	0.8mg/L	≤ 0.5mg/L or ≥ 2.0mg/L	≤ 0.3mg/L or ≥ 5.0mg/L
2 – Mt Daylight	System Integrity (monthly) Reservoir Inspection	Secure, no evidence of break in or vermin	Visual identification of breach or vermin access to reservoir	Visual identification of vermin or containment in reservoir

The attached report provides greater details as to Goldenfields compliance under the ADHG and works undertake this reporting year which has been extensive.

The DWMS and the associate Policy has also been reviewed alongside developing this Annual Report and are recommended for noting and adoption without any significant changes. No changes were made to the Policy and the Action and Improvement plan attached to the DWMS was updated to reflect works completed to make the document current.

FINANCIAL IMPACT STATEMENT

The recommendation does not impact on Council's financial position.

ATTACHMENTS: DWMS, DWMS Annual Report 21/22 and DWMS Policy

TABLED ITEMS: Nil

Drinking Water Management System

Annual Report 2021/22

Goldenfields Water County Council

Date: October 2022

Version: 3.4

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Figures

Document Control

Date	Change made	Person
August 2020	Updated Annual Report to include relevant 2019/20 data and information	Chris Breen/Geoff Veneris
October 2019	Updated Annual Report Data	Chris Breen/Geoff Veneris
October 2020	Updated Annual report with relevant data	Chris Breen/Geoff Veneris
September 2021	Updated Annual report with relevant data for 2020/21 reporting period	Chris Breen/Geoff Veneris
October 2022	Updated Annual report with relevant data for 2021/22 reporting period	Chris Breen/Geoff Veneris

Guidance

This report is designed to address the reporting (Element 10), evaluation (Element 11) and review and continual improvement (Element 12) requirements of Goldenfields Water County Council Drinking Water Management System (DWMS).

The NSW Guidelines for Drinking Water Management Systems (2013) recommends review of the following areas:

- Performance of critical control points
- Water quality review (raw, treated and distribution water quality including verification monitoring in the NSW Health Drinking Water Database)
- Levels of Service (including consumer complaints)
- Incident and emergencies (including follow up)
- Drinking Water Management System implementation
- Continuous improvement plan implementation

Review of system performance should be against ADWG, levels of service, NSW Water Supply and Sewerage Performance Monitoring Reports and other regulatory requirements (Element 1).

Shortcomings should be captured in the Improvement Plan (Element 12).

Executive Summary

Critical Control Points

The following tables provide the total number of CCP exceedances registered throughout the 2021/22 financial year with the corresponding CCP number.

Jugiong	CCP1	CCP2	CCP3	CCP4	CCP5	CCP6
Number of CCP exceedances	0	0	0	7	0	0

Oura	CCP1	CCP2	CCP3	CCP4	CCP5	CCP6
Number of CCP exceedances	1	30	0	0	0	0

Mt Daylight	CCP1	CCP2	CCP3	CCP4	CCP5	CCP6
Number of CCP exceedances	3	0	0	0	0	0

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CCP Number	Monitoring Parameter	Target Criterion	Adjustment Limit	Critical Limit
1 - Jugiong	Turbidity (Continuous online) Raw Water	Dependant on raw Water Quality		20% above set point for > 20minutes
2 - Jugiong	Turbidity (Continuous online) Filter Outlet	≤ 0.2 NTU	≥ 0.5 NTU	≥ 1.0 NTU
3 - Jugiong	Free Chlorine residual (Continuous online & alarmed) Finished Water	1.8mg/L	≤ 1.2mg/L or ≥ 2.0mg/L	**Summer**: ≤ 0.8mg/L for > 30min or ≥ 5.0mg/L **Winter**: ≤ 0.5mg/L for > 30min or ≥ 5.0mg/L
4 - Jugiong	Fluoride (Daily) Finished Water	1.0mg/L	< 0.95mg/L or > 1.05mg/L	< 0.9mg/L for > 72hrs or > 1.5mg/L
5 - Jugiong	System Integrity (monthly) Reservoir inspection	Secure, no evidence of break in or vermin	Visual identification of breach or vermin access to reservoir	Visual identification of vermin or containment in reservoir
6 - Jugiong	Free chlorine residual (continuous online & alarmed) Prunevale and Cootamundra	0.8mg/L	≤ 0.5mg/L or ≥ 2.0mg/L	≤ 0.2mg/L or ≥ 5.0mg/L

1 - Oura	Free Chlorine residual (Daily) Treated Water	0.5mg/L	≤ 0.3mg/L or ≥ 1.0mg/L	≤ 0.2mg/L or ≥ 5.0mg/L
2 – Oura	Fluoride (Daily) Treated Water	1.0mg/L	< 0.9mg/L or > 1.2mg/L	< 0.9mg/L for > 72hrs or ≥ 1.5mg/L
3 – Oura	System Integrity (monthly) Reservoir inspection	Secure, no evidence of break in or vermin	Visual identification of breach or vermin access to reservoir	Visual identification of vermin or containment in reservoir
4 - Oura	Chlorine Residual (weekly) Wyalong and Thanowring Rd	0.5mg/L	≤ 0.35mg/L	≤ 0.25mg/L
1 – Mt Arthur	Free Chlorine residual (3 x weekly) Tank 4 Outlet	0.8mg/L	≤ 0.5mg/L or ≥ 2.0mg/L	≤ 0.3mg/L or ≥ 5.0mg/L
2 – Mt Arthur	System Integrity (monthly) Reservoir inspection	Secure, no evidence of break in or vermin	Visual identification of breach or vermin access to reservoir	Visual identification of vermin or containment in reservoir
1 – Mt Daylight	Free Chlorine Residual (continuous Online) Naradhan Reservoir	0.8mg/L	≤ 0.5mg/L or ≥ 2.0mg/L	≤ 0.3mg/L or ≥ 5.0mg/L
2 – Mt Daylight	System Integrity (monthly) Reservoir Inspection	Secure, no evidence of break in or vermin	Visual identification of breach or vermin access to reservoir	Visual identification of vermin or containment in reservoir

Water Quality

Verification monitoring has been undertaken over the entire GWCC scheme during the reporting period. All data is compliant with the Australian Drinking Water Guidelines and limits set by public Health (NSW Health).

Operational monitoring has also been conducted over the entire scheme with some non-compliances reported. These non-compliances have been summarised in Table 14. The non-compliances have been mainly for low residual chlorines in the furthest extremities in each of the water source systems. The 2021/2022 reporting year was the lowest demand period on record for our water supply schemes which has exacerbated existing chlorine decay problems documented around the extremities of our systems. Water age has increased significantly in our rural localities and has a direct effect on maintaining our chlorine residuals across the schemes.

Continuous Improvement Plan

GWCC review and update their Action and Implementation Plan as per Appendix B of this report. A summary of items that have been addressed or ongoing are detailed in the below table.

	Completed or closed	In progress	Not Started	Implemented/Ongoing	Items added
Number of actions	68	2	0	9	0

*Note that the 3 items that haven't been counted above have been rolled into other action item. Full Continuous Improvement Plan can be seen in Appendix B.

DWMS Reviews

The 2017/18 DWMS was the first to be undertaken by GWCC. The 2017/18 report was conducted using only the data available at the time. The dataset used was limited to only a few months' worth of information.

This DWMS report is our fourth annual review and has utilised the entire 2021/22 data for both the Jugiong, Oura and Mt Daylight water supply systems. This data was made available from the implementation of WaterOutlook and ClearSCADA. Data is also utilised from NSW Health's Drinking Water Database.

In addition to the general progression of the DWMS, GWCC engaged its internal Auditor (National Audits Group) in 2019 to review the DWMS and provide recommendations for improvement.

A key finding was that more transparency of data reported and adopted by the Board should occur. A full list of audit findings can be found in Appendix D.

Review	Scope	Findings	Actions taken
26/09/2019	*Internal Audit*	*Listed in Appendix D*	*Responses noted in Appendix D below and added to continuous improvement plan for GWCC to action*

Reservoir Inspections

A total of 126 reservoirs, 8 surge tanks and 2 Break Pressure tanks are visually inspected weekly via a 'drive by'. A more comprehensive inspection conducted on the above is conducted on a quarterly basis. The findings of the inspections are summarised in the section headed Reservoir Inspections (page 54). A more comprehensive reservoir inspection report has been downloaded from the ASAM website, this is the database that Aqualift provide when undertaking GWCC reservoir cleaning and maintenance, the report for reservoirs inspected during the 2021/22 FY is available in Appendix C of this report. Additional internal inspection reports are completed and submitted to the Engineering division for corrective action on prioritisation of issued works.

Report Purpose

The purpose of the report is to inform and keep up to date New South Wales Department of Health (NSW Health) of Goldenfields Water County Councils (GWCC) implementation and ongoing assessment of its Drinking Water Management System. It also demonstrates that GWCC is compliant with requirement s25 Public Health Act 2010 to develop a Quality Assurance Program (QAP) in line with the framework for Drinking Water Quality Management in the Australian Drinking Water Guidelines.

Scheme Summary

GWCC provides the essential water requirements of approximately 40,000 people spread over an area in excess of 22,000 sq. km, between the Lachlan & Murrumbidgee Rivers in the Southwest of NSW.

GWCC's water supply system consists of five separate water schemes, Jugiong, Oura, Mt Arthur, Mt Daylight and Hylands Bridge. GWCC carries out water supply functions within the Local Government areas of Bland, Coolamon, Cootamundra-Gundagai Regional Council, Junee, Temora, Hilltops Council previously (Harden, Young), parts of Narrandera and Wagga Wagga.

Harden and Young Councils, now Hilltops Council are retailers who purchase bulk water from GWCC and supply the water to retail customers in their respective local government areas. Cootamundra-Gundagai Regional Council receives bulk supply from GWCC and retails water to customers in the township of Cootamundra, with GWCC supplying water to retail customers in the Cootamundra Shire outside the urban centre. GWCC also supplies small quantities of bulk water to Riverina Water County Council to service their northern supply areas.

At the end of the 2021/22 reporting period there were 11719 water connections across the entire drinking water scheme. This is an increase of 74 new connections across the Goldenfields County Council Drinking Water scheme. It should be noted that the bulk connections are identified as single connection only.

A number of projects were also undertaken that encompassed the entirety of all Drinking Water schemes; these projects and current costings are summarised below:

- Microwave Link Sites for Scada $64,1147.96
- New Scada Communication Towers $369.97
- New Scada Communications $232,633.72

Jugiong Scheme

The Jugiong drinking water supply system is one of the largest water supply systems managed by Goldenfields Water. Most of the water produced in the Jugiong system supplies the bulk water Councils of Cootamundra Gundagai and Hilltops. Water is also delivered to a small number of retail customers in rural properties and the villages of Stockinbingal, Wallendbeen and Springdale. Approximately 18,000 people are supplied water from the Jugiong system.

Source Water

Goldenfields Water is licenced to extract water from the Murrumbidgee River via two submersible pumps operated in a duty / stand-by configuration. The submersible pumps are fixed speed; pump 1 operates at 185 L/s and pump 2 operates at 300 L/s.

The Jugiong source has been categorised as having a "Low" risk regarding Cryptosporidium. NSW Public Health's preliminary outcome assessment for Cryptosporidium for the Jugiong scheme was reported to GWCC on 27th November 2019. A listed action for the Jugiong Scheme was

> *'Maintaining the operation and monitoring (ideally continuously) of individual filters to consistently reduce turbidity to <0.2 NTU'*

Goldenfields can confirm that individual turbidity meters have now been installed during the 2021/22 financial year. Commissioning is still being undertaken further liaison with NSW Health and DPE regarding alarm set points and time delays is still required.

Water Treatment Process

The Jugiong Water Treatment Plant (WTP) is located on Waterworks Road in the township of Jugiong. The plant is a conventional WTP with a nominal capacity of 40 ML/day. It should be noted that the current pump arrangements at the plant can only produce around 23.8ML a day. Recent stress testing of the plant indicates that the plant is only capable of achieving an estimated 29ML of process whilst still maintain compliance with all CCP's for a 22 hour run time.

The treatment process at Jugiong WTP comprises of the following process steps:

- Water from the Murrumbidgee River is pumped via 120 m rising main to Jugiong WTP (capacity 23.8 ML/day) by two pumps in a duty/standby configuration
- Water passes through a flow meter, where a flow of greater than 101 L/s starts the chlorine and soda ash pre-dosing systems for oxidisation of metals and pH adjustment, respectively. The chlorine pre-dose is optional, and is switched on or off by the operator, depending on water quality conditions
- The pre-dosed water enters the rapid mix tank which consists of baffles and two mixers in series. Polymer and aluminium sulphate are dosed into the rapid mix tank to aid flocculation
- Water then flows into the two flocculation tanks which has three mixers in series operating at declining speeds to allow for floc formation
- Flocculated water then enters the two clarifiers and sludge is removed by a travelling sludge rake. Sludge is sent to the duty sludge lagoon
- Clarified water enters the filter block, where it is dosed with chlorine and subsequently distributed across six gravity sand filters
- Filtered water enters a common channel. When flow in the filtered water channel is above 101 L/s, post-dosing of soda ash and chlorine are activated for pH adjustment and increased disinfection capacity, respectively. Water is also dosed with fluoride in the filtered water channel
- Flow from the filtered water channel enters the 3 ML clear water tank through a mid-level inlet and bottom outlet configuration

- Water from the clear water tank proceeds to clear water pumping station 1 (CWPS1), which has two 680 kW pumps and a smaller 400 kW pump that operate in a duty/standby/standby mode. CWPS1 distributes water to Jugiong drinking water supply system
- Treated water is distributed through 14 reservoirs and by 8 pumping stations. There are 138 km of trunk mains and 182 km of reticulation mains in the Jugiong system

The Jugiong drinking Water scheme has 675 connections. The system also supplies GWCCs bulk customers, Hilltops and Coota-Gundagai. Jugiong GWCC retail Connections are broken down as follows:

- 20mm = 512
- 25mm = 155
- 32mm = 2
- 40mm = 2
- 50mm = 1

Included in this data are 3 stand pipe connections: 1 x 32mm, 1 x 40mm and 1 x 50mm.

For the Hilltops connections that are supplied via bulk service, the following breakdown of connections were available:

Supplied Connections	20mm	25mm	32mm	40mm	50mm	65mm	80mm	100mm	150mm	Sub total
	6058	347	30	38	48	2	5	9	0	6537

Cootamundra bulk services were inclusive of the following breakdown:

Supplied Connections	20mm	25mm	32mm	40mm	50mm	65mm	80mm	100mm	150mm	Sub total
	2899	82	33	30	32	0	2	4	0	3082

Upgrades to the System/System Improvements

GWCC staff have undertaken works to upgrade several assets within the Jugiong Drinking water scheme a summary of those works are provided below:

• Wombat BT Renewal	$6,297.11
• Jugiong Raw Water Pump #4 382(Large) Overhaul	$16,317.81
• Jugiong WPS 2 Motor 3 Overhaul	$27,900
• Jugiong WTP - Valve & Pneumatic Upgrade	$115,019.68
• Jugiong WPS 2 High Voltage Motor 1 Overhaul	$2,196.14
• Rosehill Pump 1 Overhaul Pump and Motor	$28,560.51
• Jugiong CWPS1 Pump No 2 Overhaul Pump	$53,294.53
• Jugiong Old Plant Demolition	$55,332.88
• Jugiong High Voltage	$165,9776.76
• Pump Station Valve Renewals - Jugiong	$24,875.06
• Rosehill Pump Station - Jugiong	$94,013.55
• Bulk Customer Water Quality Panels - Harden Offtake	$98,430

• Jugiong CWPS2 Pump No 2	$1,876.92
• Jugiong Compressor	$1,313.66
• Stockinbingal and Springdale PRV Replacement & Decommissioning of Bauroola PRV	$3,085.50
• Jugiong SAP	$8,513.36
• Jugiong PLC Upgrade (included connection of 6 new individual filter turbidity meters)	$1,190,022.58
• PRV Replacement - Jugiong	$31,969.61
• Rosehill Pipeline Replacement	$2,362,398.54
• New Non Residential Backflow - Jugiong	$18,341.61

A total of $5,799,535.81 has been spent on the Jugiong scheme for the 2021/22 Financial year.

Oura Scheme

The Oura drinking water supply system is one of the largest water supply systems managed by Goldenfields Water. The majority of water is delivered to retail customers; however, a small amount is supplied to Riverina Water in bulk to customers along the Goldenfields Water pipeline. Approximately 15,000 people are supplied water from the Oura system. The Oura drinking water supply system can be connected to Goldenfields Water's non-drinking water supply at Hylands Bridge.

Source Water

Water is sourced from the Oura Borefield, which is located at Gumly Gumly Island to the north of Murrumbidgee River. Goldenfields Water is licensed to draw from four groundwater bores: Bore 2, Bore 3, Bore 4 and Bore 6. Bores are located in bore huts.

Water in the Murrumbidgee Inland Alluvial Aquifer is recharged by the Murrumbidgee River and is managed by the Natural Resource Access Regulator in NSW. There are two alluvial formations in this region: the Lachlan formation is a confined aquifer system that is overlain by the semi-confined to unconfined Cowra formation (NSW Dept. of Water and Energy, 2007).

According to the DPI Water (NSW Office of Water, 2011), groundwater in the Oura system is fresh, with total dissolved solids (TDS) ranging from zero to 500 mg/L and is suitable for domestic stock, some irrigation purposes and municipal use. NSW Public Health has issued preliminary advice regarding the risk of the Gumly Gumly source which has been deemed "protected". The Oura source has been categorised as having a "Low" risk regarding Cryptosporidium. NSW Public Health's preliminary outcome assessment for Cryptosporidium for the Oura scheme was reported to GWCC on 27th November 2019.

Water Treatment Process

Water for the Oura drinking water supply system undergoes aeration, disinfection and fluoridation prior to distribution.

The treatment process for Oura drinking water supply system comprises of the following process steps:

- Groundwater is pumped from the Oura Borefield by line shaft bore pumps in each bore. The bores are operated in sequential mode where increased water demand will increase

the number of bores online. The order of bore start up is operator adjustable, with the current order of preference set as: Bore No. 4, 6 and 3. Bore 2 was placed into service in November 2020, however, less than desirable water quality was achieved and it was decided to remove the bore from production until such time as it can be cleaned and flushed properly. The bore was removed from service and cleaned by an external contractor in early 2021 with a substantial amount of sand removed. It has since been placed back into service and is currently only used as a secondary pump. It is unable to be utilised as the lead pump due to high iron, manganese which strips our chlorine. Similar issues have been noticed in bore 4, 6 and 3 with the recent wet weather period and high recharge rate of the aquifers.

- The groundwater is dosed with chlorine prior to entering a tray aerator. The aerator serves to oxidate dissolved iron and manganese from the raw water.
- After aeration, water is transferred to the Oura Contact Tank (2.2 ML), where chlorine contact time is achieved before being pumped by Oura pumping station to Marrar Pinnacle (Marrar Pinnacle 1.6 ML, 1 reservoir) or the Junee BT Reservoir (Junee 17 ML, 3 reservoirs).
- The Oura pumping station consists of two 605 kW pumps and a smaller 400 kW pump that operator on a duty/duty/standby configuration
- Fluoride is dosed on the outlet of the Oura pumping station

The Oura drinking water supply system is one of the largest distribution systems managed by Goldenfields Water.

Treated water is distributed through 35 reservoirs and by 19 pumping stations. There are 201 km of trunk mains and 1,055 km of reticulation mains in the Oura system. There are two chlorine booster pumping stations located at Thanowring Road and Reefton pumping stations to ensure adequate free chlorine residual is maintained throughout the system.

Connections

The Oura drinking water scheme has 8933 connections, this scheme also supplies bulk water to Riverina Water County Council. The Oura connections are broken down as follows:

- 20mm = 7912 connections
- 25mm = 805 connections
- 32mm = 76 connections
- 40mm = 56 connections
- 50mm = 54 connections
- 80mm = 4 connections
- 100mm = 5 connections

Included in this data are 19 standpipe connections: 8 x 32mm, 5 x 40mm, 4 x 50mm and 4 x 80mm.

Upgrade to the System/System Improvements

GWCC staff have undertaken works to upgrade several assets within the Oura Drinking water scheme a summary of those works are provided below:

• Talbingo Pump 1	$60.95
• Urban Meter & Taggle Replacement Program	$164,970
• Mirrool Town Mains Extension and Meter Relocation	$16,430.89
• Dustin Rose Estate - Developer Paid Mains	$64,897.36
• Oura WTP PRV to customer	$11,543.18
• Accommodation Village - Boundary Road - West Wyalong	$18,729.96
• Oura New Connections from Riv Water (50% Contribution)	$8,457.45
• Strathmore Lane Coursing Park (Via Junee)	$189,196.51
• Methul Via Coolamon 63mm Mains Replacement	$26,668.88
• Mirrool - Newell Highway Mains Replacement	$50,740.55
• Oura Bore 4 - Emergency Bore Reline, Pump Works and Pump Upgrade	$194,368.5
• Pine St - West Wyalong - Renewal	$88,695.97
• Oura Reservoir & Aerator	$130,686.84
• Ungarie - Main Relocation Humbug Creek	$4,894.96
• Oura Pump 1 Overhaul Pump and Motor	$16,150.08
• Junee Mains St, Cox St Intersection	$16,279.14
• Ariah Park Pump Station Design	$60,827.35
• Junee 50mm Gal Replacement	$18,598.41
• Junee and Weethalle Trunk Designs	$5,811.4
• Oura Bore 4 Renewal	$184,642.01
• Pump Station Valve Renewals - Oura	$5,014.03
• Oura Pump 2 Rebuild	$2,737.39
• Oura Bore 3 Elec SB Renewal	$121,144.09
• Wyalong Reliability Project Pre Work	$557,477.81
• Oura Bore 6 Renewal	$7,611.23
• Mandamah Stage 2 - 4	$301,051.91
• Temora WPS SB Upgrade	$93,910.18
• Oura HV Elec Upgrade	$4,533,152.05
• Oura Strategic Plan	$893.72
• PRV Replacement - Oura	$79,887.17
• Thanowring Road Temora Pipeline Upgrade	$959,631.59
• New Non Residential Backflow - Oura	$10,437.78
• Coolamon North High Level Recoating	$470,564.16

A total of $8,416,163.50 has been spent on the Oura scheme for the 2021/22 financial year.

Mt Arthur Scheme

The Mt Arthur drinking water supply system supplies approximately 2,300 people. The Mt Arthur System can be supplemented by the Oura drinking Water supply system through Coolamon and Ganmain, however this is not common practice.

Water for the Mt Arthur drinking water supply system is drawn from the Lachlan Fold Belt fractured rock aquifer system, near the Murrumbidgee River at Matong. According to the DPI Water (NSW Office of Water, 2011), groundwater in this region is of moderate quality with

TDS between 500 to 1500mg/L and is suitable for domestic stock and some irrigation purposes.

Source Water

Water is sourced from Mt Arthur Borefield, which is located near the Murrumbidgee River at Matong. GWCC is licenced to draw 762ML per annum from two groundwater bores. These bores are located in Bore Huts on the corner of Old Narrandera Rd and Matong rd.

The Mt Arthur source has been categorised as having a “Low” risk regarding Cryptosporidium. NSW Public Health’s preliminary outcome assessment for Cryptosporidium for the Mt Arthur scheme was reported to GWCC on 27th November 2019.

Water Treatment Process

The Water treatment of the Mt Arthur drinking water supply system comprises of the following steps:

- Groundwater is pumped to the surface by two 94kW bore pumps in a duty/standby configuration
- Water is injected with Chlorine prior to entering the four Ganmain Low Level Reservoirs where Iron and Manganese are settled out.
- The water is then distributed to retail customers in Coolamon, Ganmain, Matong and Grong Grong

The Mt Arthur Drinking Water Supply system distributes water to the areas of Ganmain, Coolamon, Grong Grong and Matong. Treated Water is distributed through 9 reservoirs and by 6 pumping stations. There are 76km of trunk mains and 67km of reticulation mains in the Mt Arthur system.

Connections

The Mount Arthur drinking water scheme has 1556 connections, the Mount Arthur connections are broken down as follows:

- 20mm = 1458 connections
- 25mm = 57 connections
- 32mm = 33 connections
- 40mm = 5 connections

Included in this data are 4 standpipe connections: 1 x 32mm, 1 x 40mm and 1 x 50mm

Upgrades to the System/System Improvements

GWCC staff have undertaken works to upgrade several assets within the Mt Arthur Drinking water scheme a summary of those works are provided below:

• Lonsdale Pump Overhaul Pump and Motor Replacement	$50,597.50
• Coolamon Industrial Subdivision	$48,388.57
• PRV Replacement - Mt Arthur	$291.20
• New Non Residential Backflow - Mt Arthur	$43.26

A total of $99,320.53 has been spent on the Mt Arthur scheme for the 2021/22 financial year

Mt Arthur Water Scheme – Periodic inspection

The Mt Arthur Drinking Water Scheme was inspected by the Department of Planning, Industry and Environment (DPIEs) Senior Inspector Pat Freeman. This inspection was in accordance with statutory requirements of the Local Government Act 1993. At the time of inspection (15th June 2021) the system was reported as 'performing satisfactorily" and was being "well managed". The onsite water quality results taken at time of inspection are as per the table below.

Table 1. Water quality results from Mt Arthur inspection by DPIE

Reticulation	pH	Colour NTU	Turbidity NTU	Free Chlorine mg/L	Total Chlorine mg/L
Coolamon	7.2	3.9	0.31	0.58	0.6
Ganmain	7.59	1.5	0.16	0.39	0.5
Matong	8.38	3.2	0.28	0.36	0.36
Grong Grong	7.72	3.1	0.2	0.22	0.34

These results indicate that the treatment process was being managed well and the quality of the water complies with ADWG. (For parameters tested).

Mt Daylight System

The Mt Daylight drinking water is a water supply system that supplies approximately 125 people in the villages and surrounds of Naradhan, Weethalle and Tallimba.

The Mt Daylight drinking water supply system draws its ground water from the lower Lachlan alluvium, located in the Lachlan River Catchment. The aquifers surrounding Lake Ballyrogan (Lake Brewster) from which the Mt Daylight system draws its water. This is hydraulically connected to surface waters. Meaning, that ground water quality in the daylight system is connected to surface water quality, although it is expected that the ground water turbidity would be much better due to filtration through subsurface flows. Both DPI Water (NSW Office of Water 2011) and Natural Resources Commission (2006) report that the groundwater in the Mt daylight scheme is relatively fresh with low salinity, making it suitable for municipal use.

Source Water

Water is sourced from the Daylight Borefield which consists of two bores located in the Carathool Shire local government area, between Lake Brewster and the Lachlan River. The bores are jointly owned and operated by Carathool Shire Council and GWCC. GWCC owns 71% of the assets in value and Carathool owns 29%. Carathool is responsible for the maintenance, repair, and replacement of all bores. Additionally, Carathool is the water entitlement licence holder without having GWCC listed as an entitled party. GWCC is the only provider of municipal potable water supply from this scheme.

The Mt Daylight source has been categorised as having a "Low" risk regarding Cryptosporidium. NSW Public Health's preliminary outcome assessment for Cryptosporidium for the Mt Daylight scheme was reported to GWCC on 27th November 2019.

Water Treatment Process

The treatment of the water in the Mt Daylight System comprises of the following:

- Groundwater is pumped to the surface by two 30kW pumps in a duty/standby configuration to the daylight reservoirs
- Water is injected with Chlorine at the inlet to the Mt daylight reservoirs
- Water is distributed to retail customers in Naradhan, Weethalle and Tallimba.

Treated Water is distributed through 7 reservoirs and by 5 pumping stations. There are 308km of trunk mains and 8 km of reticulation mains in the Mt Daylight system.

Connections

The Mount Daylight Drinking water supply has 264 connections, these connections are broken down as follows:

- 20mm = 137 connections
- 25mm = 123 connections
- 32mm = 1 connection
- 40mm = 1 connection
- 50mm = 1 Connection

Included in this data are 2 standpipe connections: 1 x 32mm and 1 x 50mm.

Upgrades to the System/System Improvements

GWCC staff have undertaken works to upgrade several assets within the Mt Daylight Drinking water scheme a summary of those works are provided below:

• Talleeban Rd Weethalle Mains Replacement	$87,979.47
• North Weethalle WPS Electrical and Pump Upgrade	$21,953.27
• Weethalle WPS Electrical and Pump Upgrade	$24,898.73
• PRV Replacement - Daylight	$962.15

A total of $135,793.62 has been spent on the Mt daylight scheme for the 2021/22 financial year.

Rural Backflow Prevention Program

GWCC rural Backflow prevention Program sees a Reduced Pressure Zone Device (RPZD) installed on rural water connections to prevent the cross contamination of water supply.

An RPZD is a device that stops the reverse flow of contaminated water in rural areas from entering our rural water supply system.

All rural connections have been classified as high risk of cross contamination due to the use of hazardous chemicals and livestock on rural properties. Cross contamination caused by

these factors can travel back into rural customers' water mains which can potentially harm health or cause death. Due to the risk, the installation of a testable RPZD is required to ensure compliance in accordance with the Australian Standard (AS3500 Part 1: Plumbing and Drainage Section 4).

GWCC adopted the Backflow Prevention policy (PP06) in August 2016 and works began in May 2017 to install backflow devices on all rural properties. To date a total of 1347 RPZD have been installed within the GWCC area. GWCC have installed 119 RPZDs for Hilltops Council during the 2021/22 FY making it a total of 1466 installations. There are currently approximately 120 installations outstanding, or no certificate has been found and/or completed for their install.

DWMS Document Control

The Drinking Water Management System for GWCC was issued to NSW Health and DPI Water in March 2017 and adopted and approved by Council in early 2018. Only minor modifications have been undertaken to the DWMS with nothing relevant to report to the NSW Health for updating.

Document	Version	Updates	Submitted to NSW Health and date submitted?
Drinking Water Management System	2.0	Continuous Improvement Plan Appendix B	Yes, March 2017
Drinking Water Management System		Continuous Improvement Plan Appendix B	Yes, October 2019
Drinking Water Management System		Reservoir Inspection Report	Yes, October 2020
Drinking Water Management System		Continuous Improvement Plan Appendix B	Yes, October 2020
Drinking Water Management System		Continuous Improvement Plan Appendix B, Reservoir Inspection Report	Yes, September 2021
Drinking Water Management System		Continuous Improvement Plan Appendix B, Reservoir Inspection Report	Yes, November 2022

Critical Control Points

No Changes have been made to the CCP's during the 2021/22 reporting period.

Table 2. Summary of critical control points.

CCP Number	Monitoring Parameter	Target Criterion	Adjustment Limit	Critical Limit
1 - Jugiong	Turbidity (Continuous online) Raw Water	Dependant on raw Water Quality		20% above set point for > 20minutes
2 - Jugiong	Turbidity (Continuous online) Filter Outlet	≤ 0.2 NTU	≥ 0.5 NTU	≥ 1.0 NTU
3 - Jugiong	Free Chlorine residual (Continuous online & alarmed) Finished Water	1.8mg/L	≤ 1.2mg/L or ≥ 2.0mg/L	**Summer**: ≤ 0.8mg/L for > 30min or ≥ 5.0mg/L **Winter**: ≤ 0.5mg/L for > 30min or ≥ 5.0mg/L
4 - Jugiong	Fluoride (Daily) Finished Water	1.0mg/L	< 0.95mg/L or > 1.05mg/L	< 0.9mg/L for > 72hrs or > 1.5mg/L
5 - Jugiong	System Integrity (monthly) Reservoir inspection	Secure, no evidence of break in or vermin	Visual identification of breach or vermin access to reservoir	Visual identification of vermin or containment in reservoir
6 - Jugiong	Free chlorine residual (continuous online & alarmed) Prunevale and Cootamundra	0.8mg/L	≤ 0.5mg/L or ≥ 2.0mg/L	≤ 0.2mg/L or ≥ 5.0mg/L
1 - Oura	Free Chlorine residual (Daily) Treated Water	0.5mg/L	≤ 0.3mg/L or ≥ 1.0mg/L	≤ 0.2mg/L or ≥ 5.0mg/L
2 – Oura	Fluoride (Daily) Treated Water	1.0mg/L	< 0.9mg/L or > 1.2mg/L	< 0.9mg/L for > 72hrs or ≥ 1.5mg/L
3 – Oura	System Integrity (monthly) Reservoir inspection	Secure, no evidence of break in or vermin	Visual identification of breach or vermin access to reservoir	Visual identification of vermin or containment in reservoir
4 - Oura	Chlorine Residual (weekly) Wyalong and Thanowring Rd	0.5mg/L	≤ 0.35mg/L	≤ 0.25mg/L
1 – Mt Arthur	Free Chlorine residual (3 x weekly) Tank 4 Outlet	0.8mg/L	≤ 0.5mg/L or ≥ 2.0mg/L	≤ 0.3mg/L or ≥ 5.0mg/L
2 – Mt Arthur	System Integrity (monthly) Reservoir inspection	Secure, no evidence of break in or vermin	Visual identification of breach or vermin access to reservoir	Visual identification of vermin or containment in reservoir
1 – Mt Daylight	Free Chlorine Residual (continuous Online) Naradhan Reservoir	0.8mg/L	≤ 0.5mg/L or ≥ 2.0mg/L	≤ 0.3mg/L or ≥ 5.0mg/L

2 – Mt Daylight	System Integrity (monthly) Inspection	Reservoir	Secure, no evidence of break in or vermin	Visual identification of breach or vermin access to reservoir	Visual identification of vermin or containment in reservoir

Critical Limit Exceedance

A breakdown of what each CCP represents can be seen in Table 1 above. Summary of Critical Control points. Note that OCP1 relates to pH which is an operational control point with associated critical limits (<7 and >8) and is not a critical control point. However, exceedances related to this operational control point have been included in Table 3 Critical Limit Exceedances.

Table 3. Critical limit exceedances - Jugiong

Date	CCP1	CCP 2	CCP 3	CCP 4	CCP 5	CCP 6	OCP 1	Water Quality Issue	Reason	Immediate Correction	Preventive Action
10/7/2021				0.85					Fluoride blockage in Hopper	Clear Blockage	Replace Heater
19/7/2021				0.62					Fluoride Flow Solution Fault	-3 degree day, warm up	Replace Heater
11/9/2021			0.02						Plant shut down and instrument fault	Recalibrate/clean instrument and start plant	
27/9/2021				0.85							
2/12/2021				0.76					Ball Float filled with water	Replace Ball Float	
1/5/2022				0.84					Float failure		
2/5/2022				0.05							
8/6/2022							8.1				
24/6/2022				0.46							

Table 4. Critical limit exceedances - Oura

Date	CCP 1	CCP2	CCP3	CCP4	Water Quality Issue	Reason	Immediate Correction	Preventative Action
5/7/2021		0.24						
19/7/2021		0.28				Fluoride Dosing Pump fault	Changed to pump 2	
20/7/2021		0.25				Fluoride Tank Solution Fault		
6/8/2021		0.26				Fluoride plant did not run due to a cable coming loose	Reconnect cable	Have cable hard wired
26/9/2021		0.29				Fluoride fault pump stopped working	Change to second standby pump	
27/9/2021		0.33				Fluoride solution tank low level fault	Electrician to fix	Have a spare pump on shelf in case of breakdown
28/9/2021		0.3				Continued from past couple days low fluoride level	Mechanical indicates that its an electrical fault	Electrician to fix/replace

30/9/2021		0.4				Electrical fault	Waiting electricians	
2/10/2021		0.44				Fluoride not dosing	Waiting on electricians	
3/10/2021		0.41				Fluoride Not dosing	Waiting on electricians	
4/10/2021		0.24				Fluoride not dosing	Waiting on electricians	
5/10/2021		0.29				Fluoride not dosing		
6/10/2021		0.39				Fluoride not dosing		
7/10/2021		0.37				Fluoride not dosing		
8/10/2021		0.36				Fluoride not dosing		
9/10/2021		0.34				Fluoride not dosing		
10/10/2021		0.24				Fluoride not dosing		
11/10/2021		0.24				Fluoride not dosing		
12/10/2021		0.28				Fluoride not dosing		
13/10/2021		0.28				Fluoride not dosing		
14/10/2021		0.3				Fluoride not dosing		
15/10/2021		0.28				Fluoride not dosing		
16/10/2021		0.27				Fluoride not dosing		
17/10/2021		0.27				Fluoride not dosing		
18/10/2021		0.24				Fluoride not dosing		
19/10/2021		0.23				Fluoride not dosing		
20/10/2021		0.24				Fluoride not dosing		
7/10/2021		0.37				Fluoride Feeder fault	Electricians to investigate	
7/3/2022		0.26				Feeder faulted	Fitters inspected need electricians	
21/4/2022		0.82				Fluoride feeder fault		

Table 5. Critical Limit Exceedances for Mt Daylight

Date	CCP1	CCP2	Water Quality Issue	Reason	Immediate Correction	Preventative Action
31/5/2022	0.27			Chlorine regulator miss calibrated		
1/6/2022	0.14			Chlorine regulator miss calibrated		
2/6/2022	0.14			Chlorine regulator miss calibrated	Recalibrate and increase dose rate	Add SCADA Alarms

Goldenfields Water

Critical Control Point Graphs

Figure 1. Jugiong water treatment plant - free chlorine.

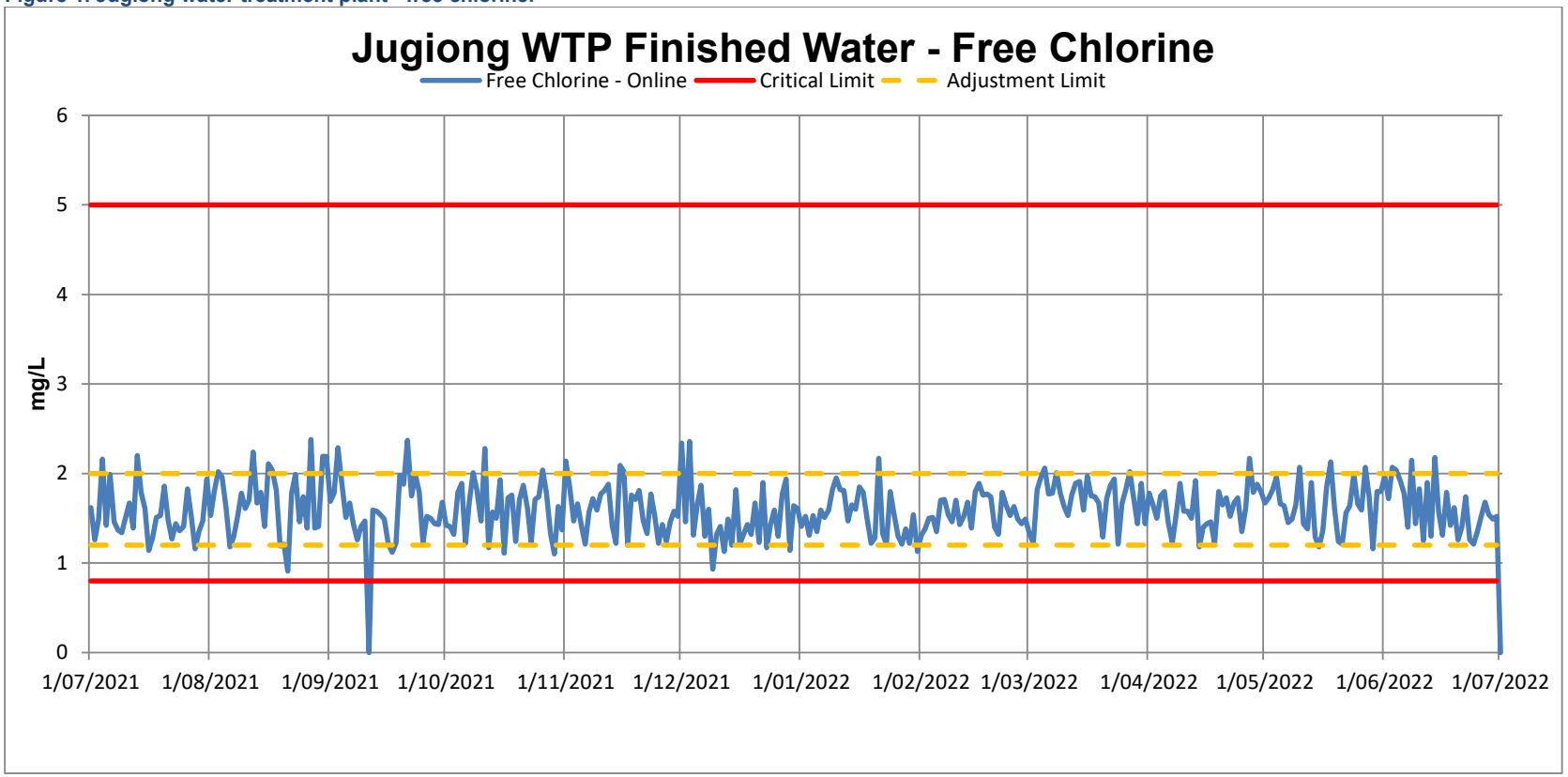

Figure 1 above is a representation of Free Chlorine in the water leaving the Jugiong Water Treatment Plant. The red lines are our Critical Control Points (CCP) for the concentration of chlorine in the water and the orange lines are our Operational control points. As is indicated above, GWCC is consistently within the CCP throughout the year with the exception of 1 exceedance. This exceedance is explained in Table 3 above as failed instrumentation.

Figure 2. Jugiong water treatment plant - finished fluoride.

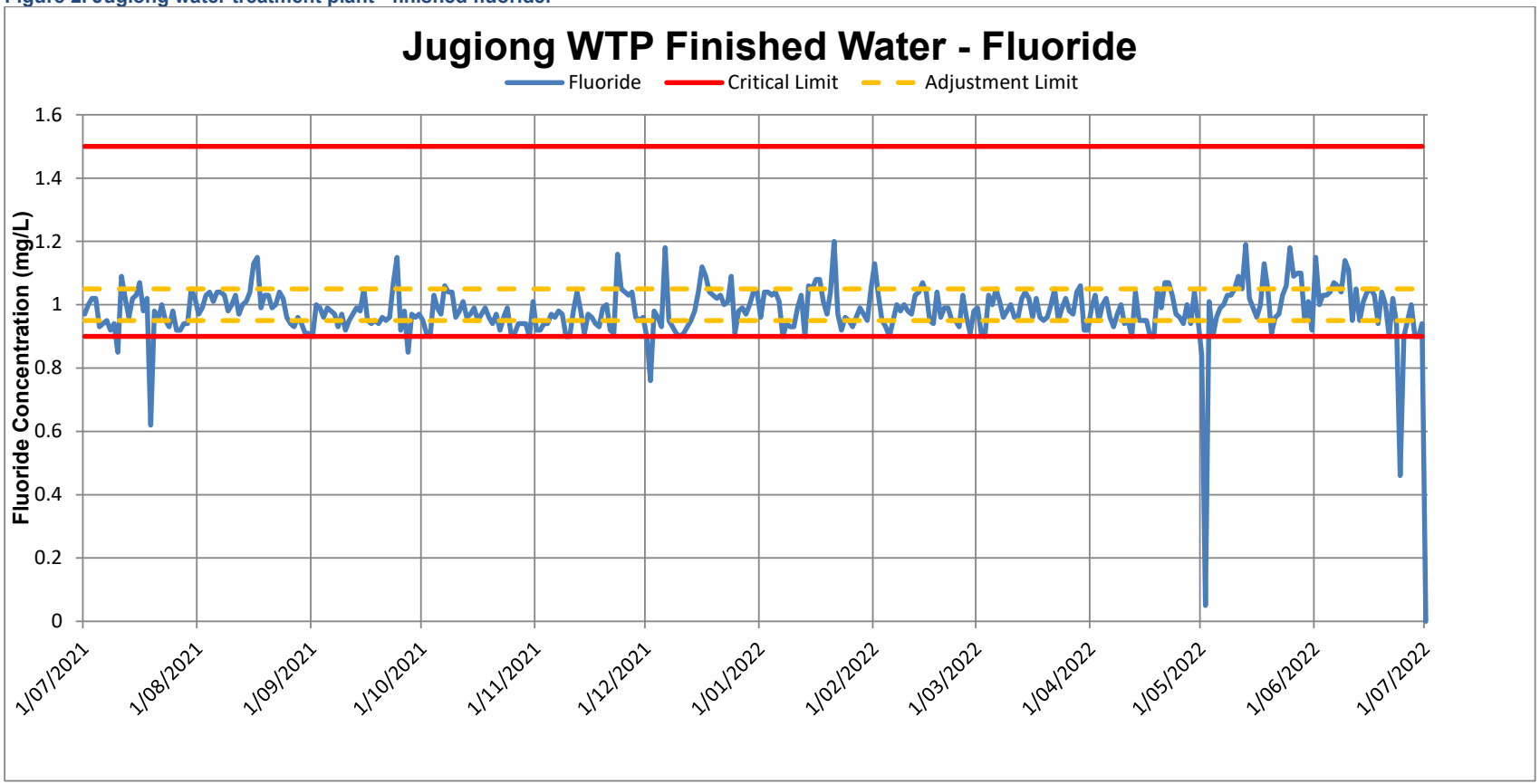

Figure 2 is a representation of the Finished Water Fluoride in the water leaving the Jugiong Water Treatment Plant. The red lines are our Critical Control Points (CCP) limits for the concentration of Fluoride in the water and the orange lines are our Operational control points. As is indicated above, GWCC is generally within the CCP throughout the year with the exception of 7 exceedances as indicated above. These exceedances are explained in Table 3 above, Critical Limit exceedances. Fluoride dosing equipment has been recently audited by Atom Consulting in 2020 with an estimated price for replacement of equipment to be $190,000.

Figure 3. Oura water treatment plant - finished water free chlorine.

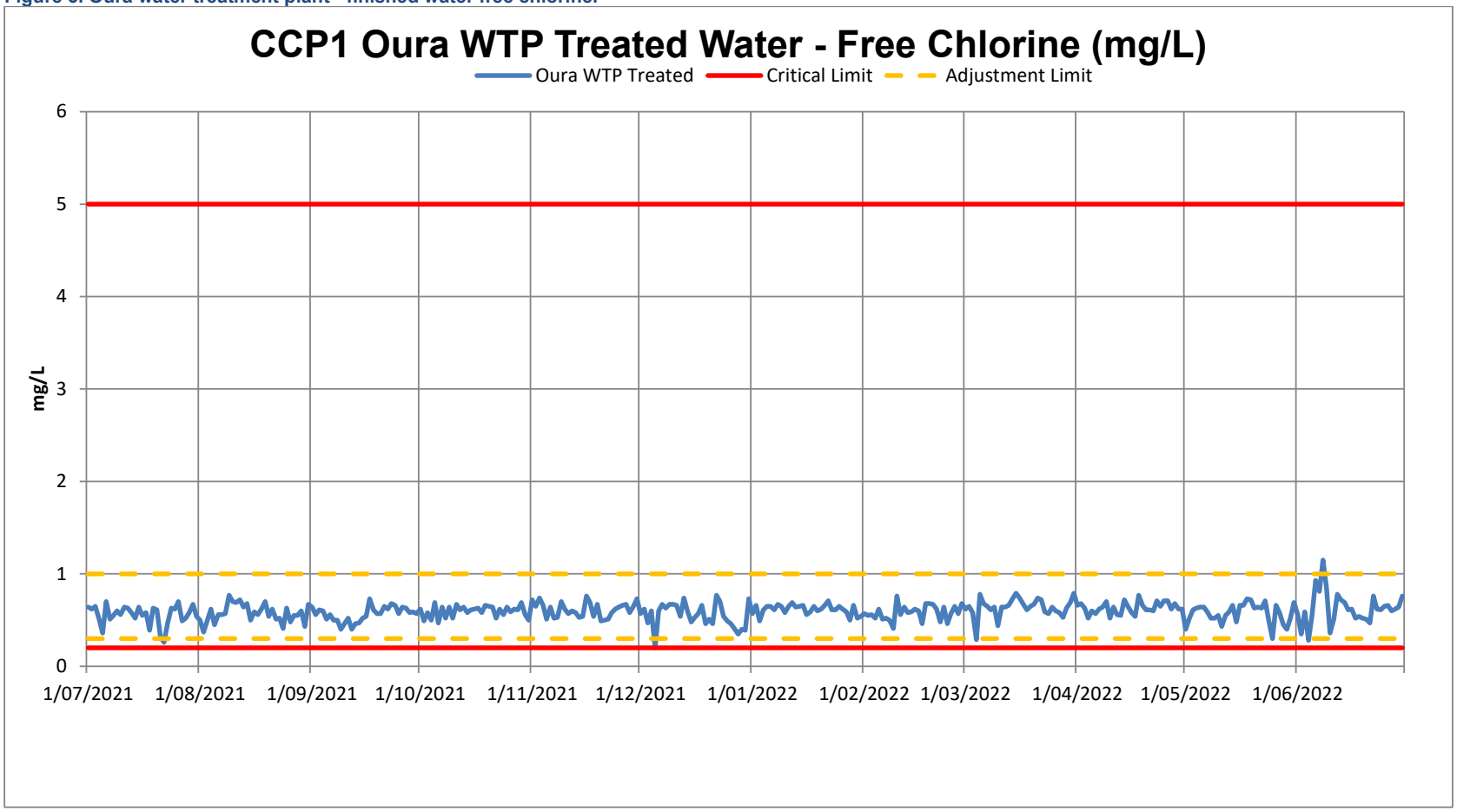

Figure 3 above is a representation of Free Chlorine in the water leaving the Oura Water Treatment Plant which employs a logarithmic scale on vertical axis. The red lines are our Critical Control Points (CCP) for the concentration of chlorine in the water and the orange lines are our Operational control points. As is indicated above, GWCC is consistently within the CCP throughout the year with no exceedances.

Figure 4. Oura water treatment plant - treated water fluoride.

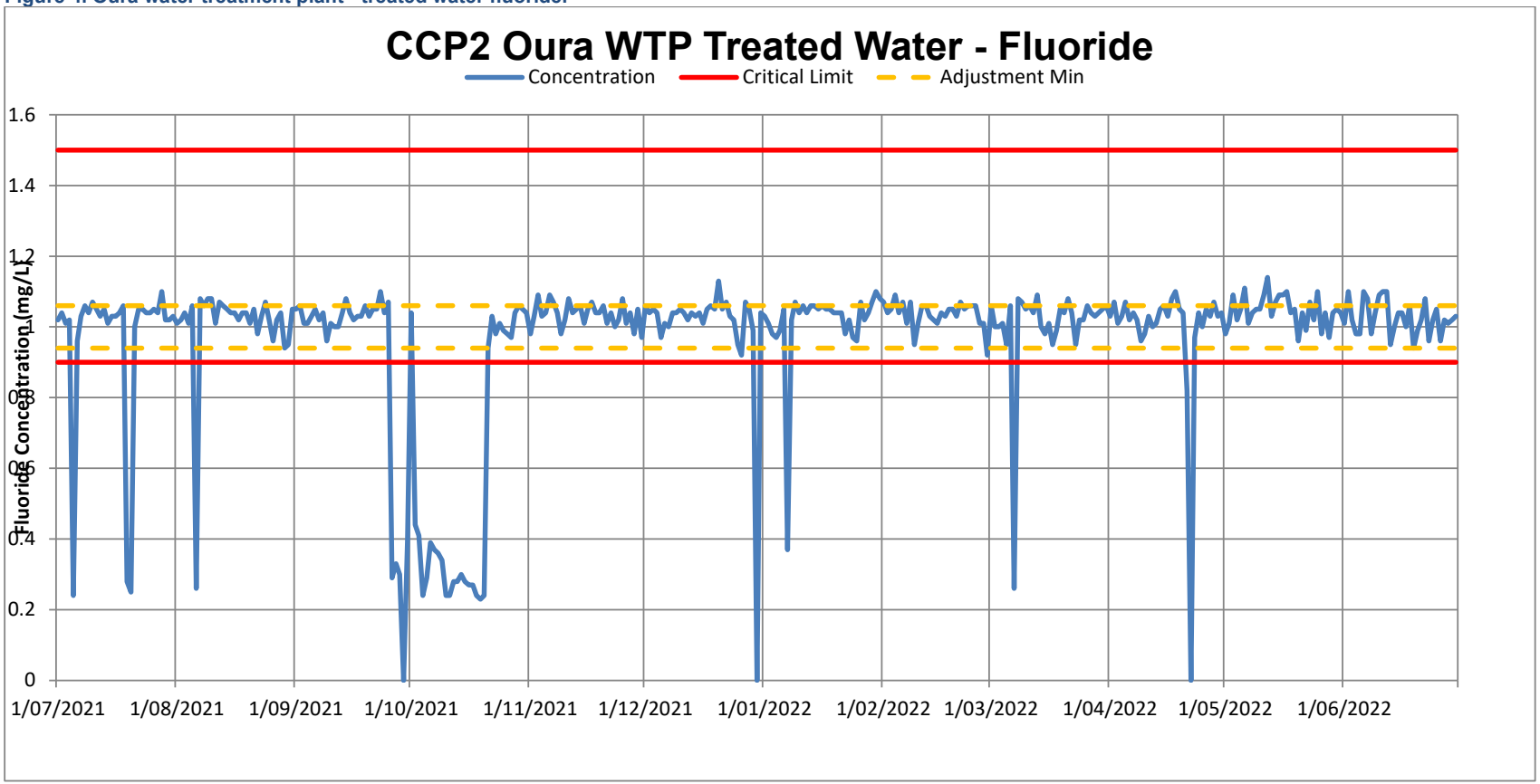

Figure 4 above is a representation of the Finished Water Fluoride in the water leaving the Oura Water Treatment Plant. The red lines are our Critical Control Points (CCP) limits for the concentration of Fluoride in the water and the orange lines are our Operational control points. As is indicated above, there has been multiple exceedances throughout the reporting period, these exceedances have been explained in table 4 above. New Fluoride assets are recommended by GWCC and will be considered for replacement in 2024 in conjunction with the development of a new pump station and dosing facility.

Figure 5: Mt Daylight finished water Free Chlorine

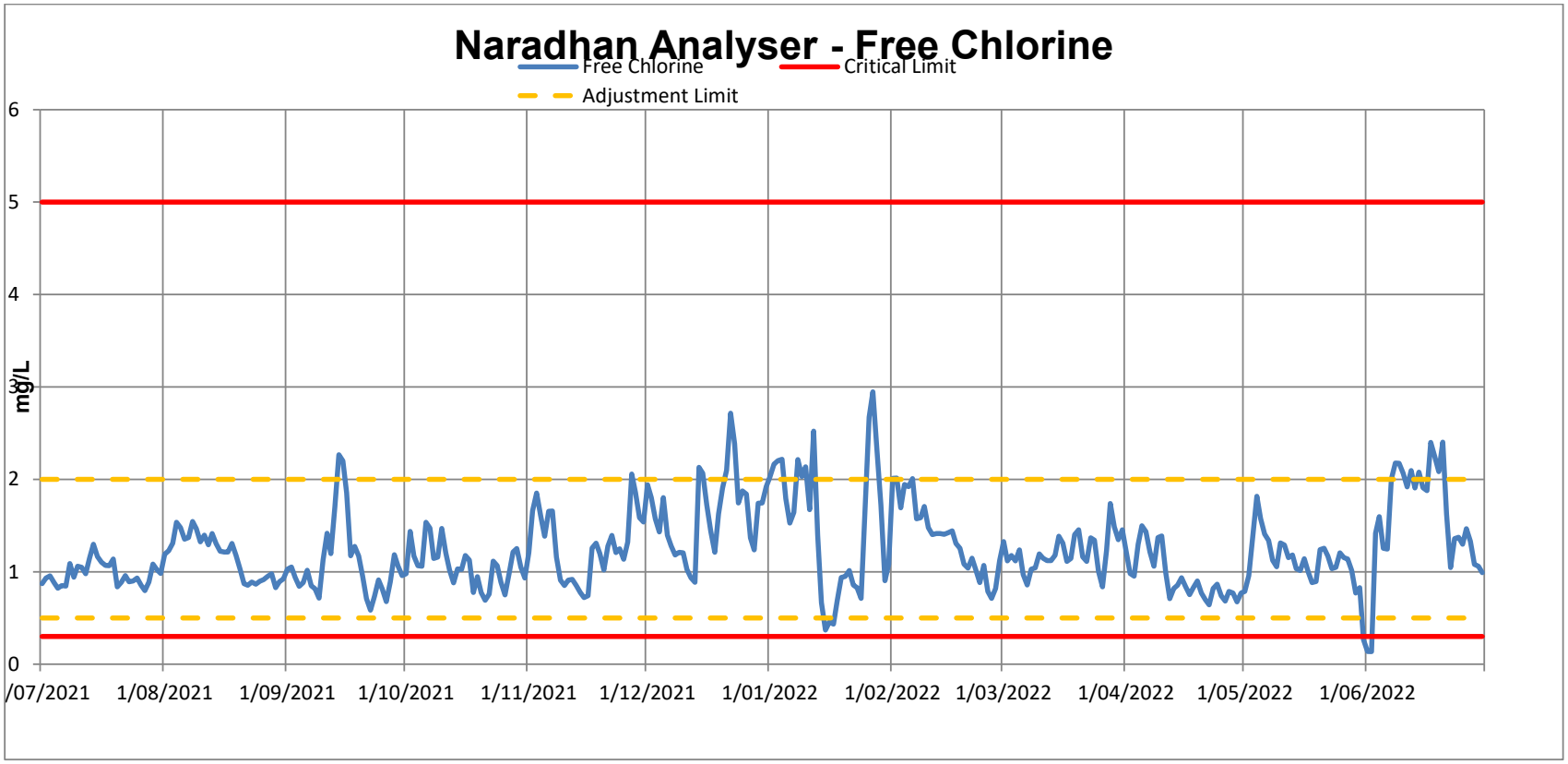

Figure 5 above is representative of the finished water Free Chlorine for the Mt Daylight system. The red lines are our CCPs and the orange lines are the operational limits. It has been a very consistent throughout the year, however, there were three exceedances reported due to failed calibrations.

These exceedances have been explained in table 5 above.

Fluoride Critical Limit exceedance

See Table 3. Critical limit exceedances - Jugiong and Table 4. Critical limit exceedances - Oura.

Table 6. Fluoride critical limit exceedances – Summary all results in (mg/L)

Date	Scheme	Recorded Concentration (mg/L)	Amount Exceeded By (mg/L)
10/7/2021	Jugiong	0.85	0.1
19/7/2021	Jugiong	0.62	0.33
27/9/2021	Jugiong	0.85	0.1
2/12/2021	Jugiong	0.76	0.19
1/5/2022	Jugiong	0.84	0.11
2/5/2022	Jugiong	0.05	0.9
24/6/2022	Jugiong	0.46	0.51
5/7/2021	Oura	0.24	0.71
19/7/2021	Oura	0.26	0.69
20/7/2021	Oura	0.25	0.7
6/8/2021	Oura	0.26	0.69
26/9/2021	Oura	0.29	0.66
27/9/2021	Oura	0.33	0.62
28/9/2022	Oura	0.3	0.65
30/9/2021	Oura	0.4	0.55
2/10/2021	Oura	0.44	0.51
3/10/2021	Oura	0.41	0.54
4/10/2021	Oura	0.24	0.71
5/10/2021	Oura	0.29	0.66
6/10/2021	Oura	0.39	0.56
7/10/2021	Oura	0.37	0.58
8/10/2021	Oura	0.36	0.59
9/10/2021	Oura	0.34	0.61
10/10/2021	Oura	0.24	0.71
11/10/2021	Oura	0.24	0.71
12/10/2021	Oura	0.28	0.67
13/10/2021	Oura	0.28	0.67
14/10/2021	Oura	0.3	0.65
15/10/2021	Oura	0.28	0.67
16/10/2021	Oura	0.27	0.68
17/10/2021	Oura	0.27	0.68
18/10/2021	Oura	0.24	0.71
19/10/2021	Oura	0.23	0.72
20/10/2021	Oura	0.24	0.71
7/1/2022	Oura	0.37	0.58
7/3/2022	Oura	0.26	0.69
21/4/2022	Oura	0.82	0.13

Water Quality

Throughout the reporting period GWCC have undertaken numerous water samples for both operational and verification monitoring. These samples are tested at the GWCC laboratory or an external NATA accredited laboratory for operational monitoring or NSW Health's FASS lab for

verification or compliance purposes. GWCC also conducted a number of onsite tests for operational purposes which are presented below.

Water samples are tested for Physical, Chemical and Microbial properties in the water.

Throughout the reporting period GWCC have conducted a total of 1296 microbial water samples to be either tested by NSW Health or tested 'in-house' by GWCC Water Quality staff.

The drinking water is also tested throughout the period for chemical elements which may be present in the water, a total of 186 water samples were carried out during the reporting period, and all were tested by NSW Health's FASS laboratory. From the 186 total samples collected and tested, 116 were treated water samples taken in the distribution system and 70 were raw or bore water samples.

GWCC also undertake pesticide sampling of the drinking water across the entire scheme. These samples are tested by a NATA accredited laboratory for the 2021/22 FY a total of 14 samples were tested for the presence of pesticides. All sample results were compliant with parameters set in the ADWGs.

It is also a requirement for GWCC to test for Radiological characteristics in the ground water supplies every 2 years, for the 2021/22 FY 4 Radiological samples were taken and tested by Australian Nuclear science and Technology Organisation (ANSTO). Results and locations can be seen in table 11.

Another initiative undertaken by GWCC is the monitoring of chlorine within the distribution system networks across the entire drinking water scheme. These tests are conducted routinely by the distribution staff and a total of 3165 chlorine test were conducted onsite throughout the year. These tests include both Total and Free chlorine. A running spreadsheet of results was previously updated by office staff once data was received by the distribution staff and is now located in GWCC new database Content Manager (doc 18/1344). Water outlook has since been rolled out to the distribution staff to upload the results of the chlorine tests. Since this implementation of WO to staff there has been 7375 chlorine test results uploaded into the database. See table 8 below, 'GWCC entire distribution system chlorine management'.

Data Collection

GWCC have conducted numerous monitoring samples throughout the distribution system as well as a number of verification samples that are tested by independent Forensic Analytical Science Services (FASS) laboratories. Below is a summary of Micro samples taken and tested throughout GWCC distribution system as well as tests conducted onsite and at GWCC Water Treatment plants.

Table 7. Micro sampling summary

Microorganisms Summary					
Tests conducted	**Tested by Pathology**	**Non-compliant samples**	**Tested In House**	**Non-compliant samples**	**(Total)**
Jugiong	78	0	208	3	286
Oura	270	0	481	0	751
Mt Arthur	64	0	91	0	155
Mt Daylight	26	0	78	0	104
Total	438	0	858	3	1296

New South Wales Health – Micro Monitoring

New South Wales Health Drinking Water Monitoring Program outlines the number and allocation of samples within a Drinking Water System. These numbers are based on population served and the complexity of the system. Currently GWCC have 438 water samples tested by FASS for E.coli and Faecal Coliforms across the entire drinking water scheme. These numbers can be further broken down into water supply systems:

- Jugiong Drinking Water Scheme 78 samples annually for E.coli and Faecal Coliforms
- Oura Drinking Water Scheme 270 samples annually for E.coli and Faecal Coliforms
- Mount Arthur Drinking Water Scheme 64 samples annually for E.coli and Faecal Coliforms
- Mount Daylight Drinking Water Scheme 26 samples annually for E.coli and Faecal Coliforms

Comprehensive Chemical Sample Summary

Table 8. Comprehensive chemical sample results - summary

	Tested by FASS (Verification and Operational)	Non-compliant samples	Samples with an indicator not compliant with ADWG e.g. Iron or Manganese or pH	Reason/Notes:
Comprehensive chemical Samples Treated Water	67	See Table 14	6	See list below Some samples are Non-Compliant for more than 1 parameter
Comprehensive Chemical for Raw and/or Bore Data	69			

GWCC conduct both Verification and Operational monitoring of potential chemicals in the drinking water over all of the drinking water scheme. Raw water or untreated water samples are taken from all duty bores from Mt Arthur, Mt Daylight and Oura on a monthly basis. Treated water samples are also taken in the distribution system of all of these schemes. As can be seen from table 6 above GWCC has conducted 67 comprehensive chemical samples for our treated water and 69 samples for our raw and/or bore water. A breakdown of how many samples were taken and tested by the FASS lab for each drinking water scheme is presented below:

- **Oura** – 17 raw water samples were taken from the duty bores each month and 35 Treated water samples taken from the distribution system.
- **Jugiong** – 24 raw water samples taken from the Murrumbidgee River and 12 Treated water samples were taken from the distribution system.
- **Mt Daylight** – 16 Raw water samples were taken from the bores and 2 Treated water samples taken from the distribution system.
- **Mt Arthur** - Raw water samples were taken from the duty bore each month, a total of 12 samples for the reporting period and 7 Treated water samples taken from the distribution system.

Table 9. Breakdown of number of samples with parameters exceeding ADWG values – Treated Water only.

Site	Indicator Non-Compliant							
	Selenium	Iron	Manganese	Colour	Turbidity	pH	Fluoride	Lead
Distribution – Oura Scheme			1			2	19	1
Distribution – Jugiong Scheme			1					
Distribution – Mt Arthur Scheme		1				1	7*	

Note: Only shows treated water samples taken from the distribution systems. **Non Fluoridated system*

Source water (Ground Water) monitoring has also been increased during the reporting period. All 'on duty' bores are sampled every month and samples sent to FASS for testing. A total of 45 samples were taken during the reporting period from a combination of Oura Bores, Mt Arthur Bores and Mt Daylight bores.

Chlorine Distribution Summary

Table 10. GWCC entire distribution system chlorine management

Chlorine Distribution System Monitoring	in Situ tests for Chlorine from spreadsheet and Water Outlook for (2020/21)	in Situ test results for Chlorine - since implementation of Water Outlook
Entire Scheme	3165	4210

Every week GWCC distribution staff conduct Chlorine Analysis of the water distribution system at GWCC. Above is a summary of how many samples are tested for Free, Total Chlorine as well as Temperature and soon Turbidity and pH throughout the entire distribution system.

Radiological Sampling

NSW Health Drinking Water Monitoring Program indicates that Ground water supplies are to be tested every 2 years for Radiological characteristics. Table 11 below shows the results of these tests. All samples are within ADWG guidelines. Note: these samples are from 2018/19 and are GWCCs most recent results, Radiological testing will be undertaken in November 2020.

Table 11. Results of radiological sampling

Sample description	Client ID	Ansto ID	Gross Alpha (Bq/L)	Gross Beta (Bq/L)
Oura Bore 2	Bore 2	C0887	0.03 ± 0.01	0.03 ± 0.01
Oura Bore 6	Bore 6	C0888	0.034 ± 0.015	0.03 ± 0.01
Mt Arthur Bore 1	Bore 1	C0889	<0.03	<0.03
Jugiong River	River	C0890	0.09 ± 0.01	0.08 ± 0.01

Water Treatment Plants

GWCC have two main Water Treatment Plants (WTPs) located at Jugiong and Oura. A number of operational water sample results are taken and used on daily basis to help with the operation of the plants and to determine correct amounts of chlorine and fluoride that need to be injected into the water to make it suitable for consumption. Below is a list of the tests conducted and where within the treatment process they are taken.

Along with the operational monitoring conducted at the WTPs, verification monitoring is also undertaken, specifically for Fluoride. A fluoride sample is taken from both WTPs every month and sent to FASS for testing. Results can be seen in the Fluoride Compliance Summary report in appendix C.

Table 12. Jugiong water treatment plant in-house testing

Raw Water	Dosed Water	Settled Water	Finished Water
Fluoride	pH	Turbidity	Turbidity - online
Turbidity - online		Colour	Turbidity - Offline
Turbidity - Offline		pH	Colour
Colour			pH
pH			Alkalinity
Alkalinity			Hardness
Hardness			Temperature
Temperature			Free Chlorine
			Total Chlorine
			Fluoride

Table 13. Oura water treatment plant in-house testing

Raw Water	Treated Water	Oura Collection tank
Temperature	Free Chlorine	Turbidity
Fluoride	Total Chlorine	
pH	Temperature	
	Fluoride	
	pH	

Non-Compliant Data

Operational monitoring indicates there have been some incidences of high pH and low residual chlorine in the extremities of the Jugiong, Oura, Mt Daylight and Mt Arthur drinking water schemes. Results are indicated in Table 14 below.

Table 14. Summary of non-compliant water quality data from operational monitoring

Date	Location	Parameter	Exceedance	Correction	Preventive action	Notes
Jugiong Scheme						
2/8, 10/8, 16/8, 23/8, 19/10, 16/11, 6/12, 7/12, 12/1, 20/1, 9/2, 8/2, 8/3, 27/4, 10/5,	**Young Storage Outlet**	Free Chlorine	0.2, 0.07, 0.09, 0.17, 0.02, 0.15, 0.02, 0.07, 0.02, 0.02, 0.02, 0.07, 0.18, 0.02, 0.12, 0.07,	Upstream Dosing	More monitoring	
10/5, 7/12	**Young Storage Outlet**	Turbidity (NTU)	1.13, 1.7			
12/1, 8/3,	**Young Storage Inlet**	Free Chlorine	0.08, 0.02			
7/12, 12/1,	**Young Storage Inlet**	Turbidity (NTU)	1.08, 1.36			
27/4	**Young Storage Outlet**	pH	9.22	Recalibrate analyser		
16/9, 9/2, 29/3,	**Young Terminal Inlet**	Free Cl	0.02, 0.03, 0.16			
16/8, 16/9	**Young Terminal Inlet**	Turbidity (NTU)	1.72, 1.34			
7/12	**Black Range**	Turbidity(NTU)	1.56			
19/10, 12/1, 8/2, 8/3	**Harden Town offtake**	Free Cl	0.06, 0.02, 0.02, 0.02	Manually Dose harden Town res	Extra Monitoring Upstream	
19/10, 8/2	**Cowangs reservoir Inlet**	Free Cl	0.11, 0.02, (mg/L)	Manual Dose	Monitor Cl coming out of plant, run sample water longer	
7/12	**Cowangs reservoir Inlet**	Turbidity (NTU)	1.12			

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Date	Location	Parameter	Exceedance	Correction	Preventive action	Notes
12/1, 20/1, 9/2, 8/2, 16/2, 8/3, 22/3, 29/3, 27/4, 10/5,	**Cowangs reservoir Outlet**	Free Cl	0.02, 0.05, 0.09, 0.02, 0.02, 0.02, 0.1, 0.13, 0.05, 0.18			
18/8, 15/9, 13/10, 7/12, 8/12, 12/1, 30/3, 2/5, 10/5	**New Horizon Gundagai Rd**	Free Cl	0.11, 0.1, 0.02, 0.02, 0.16, 0.02, 0.02, 0.02, 0.05	Manual Dose upstream	Monitor Cl in distribution	
12/1, 2/5	**New Horizon Gundagai Rd**	Colifroms	11, 22			
10/8, 6/9, 20/9, 27/9, 13/10, 7/12, 12/1, 1/3,	**Stockinbingal Bowling Club**	Free Cl	0.14, 0.12, 0.15, 0.13, 0.09, 0.03, 0.02, 0.02 (mg/L)	Manual Dose	Monitor Cl in Distribution System	
7/12	**Stockinbingal Bowling Club**	Turbidity (NTU)	1.07			
6/12, 7/12, 12/1, 20/1, 9/2, 1/3, 22/3, 29/3, 9/5, 10/5	**Bauloora Res**	Free Cl	0.16, 0.03, 0.02, 0.02, 0.08, 0.02, 0.02, 0.02, 0.02, 0.02(mg/L)	Manual Dose	Monitor Cl in Distribution system	
7/12	**Bauloora Res**	Turbidity (NTU)	1.07			
10/8, 16/8, 23/8, 6/9, 15/9, 20/9, 12/10, 25/10, 3/11, 23/11, 6/1, 20/1, 1/3, 2/3, 22/3, 29/3, 27/4, 2/5,	**Dirnaseer reservoir**	Free Cl	0.08, 0.03, 0.08, 0.16, 0.02, 0.02, 0.05, 0.02, 0.02, 0.17, 0.15, 0.05, 0.02, 0.02, 0.02, 0.11, 0.02, 0.19, (mg/L)	Manual Dose	Monitor Cl in Distribution system	
1/3	**Dirnaseer reservoir**	Temperature	25.4			
18/8, 13/10, 7/12, 12/1, 1/3, 30/3, 2/5	**Town offtake Springdale**	Free Cl	0.02, 0.02, 0.02, 0.02, 0.02, 0.02, 0.02, (mg/L)	Manual dose	Monitor cl in Distribution system	Near the end of the line for the Jugiong system

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Date	Location	Parameter	Exceedance	Correction	Preventive action	Notes
7/12, 1/3, 2/5	**Town offtake Springdale**	pH	8.65, 8.72, 8.58			
18/8	**Town offtake Springdale**	Turbidity (NTU)	1.27			
15/9, 7/12, 2/5	**Wallendbeen School**	Free Cl	0.17, 0.06, 0.11 mg/L	Manual Dose Upstream	Monitor Cl in distribution	
7/12, 23/6	**Wallendbeen School**	Turbidity (NTU)	1.08, 1.06			
2/5	**Wallendbeen School**	pH	8.58			
20/9, 20/1	**Rosehill Pump Station**	Free Cl	0.14, 0.02 (mg/L)	Manual Dose	Monitor Cl in distribution	
13/9, 25/10, 6/12, 6/1, 20/1, 16/1, 1/3, 11/3, 29/3, 27/4, 9/5,	**Wallendbeen res**	Free Cl	0.1, 0.02, 0.02, 0.09, 0.14, 0.02, 0.04, 0.02, 0.07, 0.02, 0.1			
10/8, 16/8, 23/8, 27/9, 3/11, 6/1, 11/3, 22/3, 9/5, 26/5, 16/6,	**Brawlin Res**	Free Cl	0.04, 0.11, 0.03, 0.02, 0.02, 0.02, 0.03, 0.02, 0.07, 0.02, 0.07			
12/10, 25/10, 3/11, 6/12, 20/1, 1/3, 11/3, 22/3, 29/3, 26/5,	**Frampton Res**	Free Cl	0.07, 0.02, 0.15, 0.08, 0.05, 0.02, 0.04, 0.09, 0.02, 0.02			
16/8, 11/3, 22/3	**Stockinbingal Res**	Free Cl	0.02, 0.05, 0.02			
28/5	**Temora East**	Free Cl	0.18			
Oura Scheme						
12/1, 23/2, 22/3	**Tara Pump Station Discharge**	Temperature	26.1, 28.7, 27			

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1/12, 12/1, 22/3, 20/4, 18/5	**Tara Pump Station Discharge**	pH	8.57, 8.52, 8.53, 8.62, 8.97			
23/2,	**Ariah Park Res**	Temperature	26.3			
23/2	**Ariah Park Res**	Turbidity (NTU)	1.17			
22/10, 22/3, 20/4, 18/5	**Ariah Park Res**	pH	8.62, 8.53, 8.53, 8.56			
12/1	**Wellmans St, Ariah Park**	Temperature	27.7			
11/8, 12/1	**Wellmans St, Ariah Park**	pH	8.73, 8.73			
12/1, 23/2	**Beckom Hotel**	Temperature	25.6, 25.9			
11/8, 22/10, 2/2, 22/3, 20/4, 18/5	**Beckom Hotel**	pH	8.73, 8.68, 8.56, 8.69, 8.71, 8.71			
22/10, 1/12, 12/1, 20/4, 18/5	**Ardlethan**	pH	8.79, 8.63, 8.69, 8.75, 8.88		Mains Flushing/ Cleaning, pH correction	
12/1, 23/2	**Ardlethan**	Temperature	26.2, 25.9			
26/11, 11/2, 14/3,	**Barellan Res**	Free Cl	0.16, 0.11, 0.19			
12/1, 24/1, 31/1, 23/2, 7/3, 11/3	**Barellan Res**	Temperature	26.4, 26, 27, 27.4, 26.5, 26.2			
3/11, 1/12, 22/3, 20,4	**Barellan Res**	pH	8.61, 8.57, 8.61, 8.69			
21/3	**Temora BT inlet**	Temperature	25.8			
18/1, 14/6	**Temora BT inlet**	Turbidity (NTU)	1.26, 13.9			
4/6, 5/6	**Temora town res outlet**	Free Cl	0.11, 0.12			
18/1, 7/2, 21/3	**Temora town res outlet**	Temperature	26.4, 26, 26.1			
14/6,	**Temora High School**	Free Cl	0.17			
18/1, 7/2	**Temora High School**	Temperature	26, 26.4			

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Date	Location	Parameter	Exceedance	Correction	Preventive action	Notes
6/4, 14/6	**Beattie St Temora**	Free Cl	0.09, 0.09			
18/1, 7/2, 6/4	**Beattie St Temora**	Temperature	28.2, 28.5, 25.1			
6/4	**Beattie St Temora**	pH	8.69			
22/9	**Beattie St Temora**	Turbidity (NTU)	1.18			
22/9, 14/6	**Temora West School**	Free Cl	0.19, 0.12			
18/1, 7/2	**Temora West School**	Temperature	28.5, 27			
25/8, 22/9, 18/1	**Temora West School**	pH	8.72, 8.6, 8.55			
8/12, 18/1, 7/2, 6/4	**Temora Caravan Park**	Temperature	26.1, 29.4, 28, 26.4			
27/8, 22/10	**Temora Caravan Park**	Turbidity (NTU)	1.02, 19.8			
6/4	**Temora Caravan Park**	pH	8.56			
21/3	**Cartwrights Hill reservoir**	Temperature	26.3			
17/9	**Marrar**	Free Cl	0.09			
22/10	**Marrar**	Turbidity (NTU)	3.38			
18/1	**Marrar**	Temperature	25.6			
19/1	**Junee Balance tank inlet**	Turbidity (NTU)	1.75			
23/8, 18/11, 19/1, 2/6	**Junee Balance tank outlet**	Turbidity (NTU)	1.28, 1.18, 1.75, 1.22			
23/8, 23/9, 23/9, 2/6	**Junee Public School**	Turbidity (NTU)	1.86, 2.1, 3.05,1.15	Flushing	NO DES	
19/1,	**Junee High School**	Free Cl	0.02			
19/1	**Junee High School**	Temperature	25.8			
23/8, 19/1	**Junee High School**	Turbidity (NTU)	1.4, 1.97			
23/8, 18/11, 2/6	**Prince St Junee**	Turbidity (NTU)	1.5, 1.5, 1.05		NO DES	
23/9	**Marinna**	Free Cl	0.04			
23/9, 19/10, 18/11, 29/6	**Illabo Hotel**	Free Cl	0.0.12, 0.12, 0.02, 0.04 (mg/L)	Manual Dose	Monitor Distribution	

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Date	Location	Parameter	Exceedance	Correction	Preventive action	Notes
19/1, 8/3	**Illabo Hotel**	Temperature	25.7, 26			
23/9, 19/10, 8/3, 29/6	**Illabo Hotel**	pH	8.6, 8.51, 8.58, 8.67			
23/9, 7/12	**Eurongilly Res**	Free Cl	0.04, 0.16			
23/8, 23/9, 19/10, 18/11, 7/12, 9/2, 29/6	**Wantabadgery Hall**	Free Cl	0.19, 0.1, 0.19, 0.15, 0.1, 0.16, 0.18	Manual Dose	Monitor Distribution	
29/6	**Wantabadgery Hall**	Turbidty (NTU)	1.78			
29/6	**Wantabadgery Hall**	pH	8.58			
18/5	**Ariah Park Central School**	Free Cl	0.17			
18/5	**Ariah Park Central School**	Turbidity (NTU)	1.1			
18/5	**Ariah Park Central School**	pH	9.07			
18/5	**Palace Hotel Ardlethan**	pH	9.05			
22/9	**Marrar Public School**	Free Cl	0.03			
1/12, 2/2, 23/2	**Ariah Park Golf Club**	Temperature	25.3, 26, 27.8			
8/10, 23/2	**Ariah Park Golf Club**	Turbidity (NTU)	2.4, 1.2			
9/9, 3/11, 1/12, 20/4	**Ariah Park Golf Club**	pH	8.79, 8.57, 8.72, 9.05			
2/2, 23/2, 22/3	**Ardlethan (Bygoo St)**	Temperature	27, 28.6, 28			
12/1	**Barmedman Town reservoir**	Temperature	25.3			
4/1, 12/1, 25/1, 24/1, 31/1, 4/2, 15/2, 21/2, 9/3, 17/3	**Barmedman Park**	Temperature	25.1, 26.2, 25.5, 26, 28.1, 26, 25.1, 26.3, 25.6, 25.4			Hot Summer

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Date	Location	Parameter	Exceedance	Correction	Preventive action	Notes
26/11,	**Barellan Low Level**	Free Cl	0.16			
7/3	**Barellan Club**	Temperature	25.9			
9/9, 3/11, 1/12, 20/4	**Ariah Park Golf Club**	pH	8.79, 8.57, 8.72, 9.05		Flushing, pH correction	
1/12, 2/2, 23/2	**Ariah Park Golf Club**	Temperature	25.3, 26, 27.8			
8/10, 23/2	**Ariah Park Golf Club**	Turbidity	2.4, 1.2			
5/8, 22/10, 26/10, 23/11, 24/1, 15/2, 14/3, 10/5, 7/6	**Wyalong Pump Station Meter**	pH	8.59, 8.8, 8.61, 8.63, 8.57, 8.53, 8.59, 8.95, 8.9		Mains Flushing/ Cleaning, pH correction	
24/1, 15/2	**Wyalong Pump Station Meter**	Temperature	26, 27			
5/8, 26/10, 23/11, 24/1, 15/2, 10/5, 7/6	**Wyalong School, George Bland Ave**	pH	8.63, 8.56, 8.6, 8.55, 8.51, 8.95, 9.11		Mains Flushing, pH correction	
24/1, 15/2	**Wyalong School, George Bland Ave**	Temperature	26, 26			
5/8, 2/9, 26/10, 23/11, 13/12, 24/1, 15/2, 14/3, 10/5, 7/6	**Perseverance St west Wyalong**	pH	8.77, 8.6, 8.6, 8.53, 8.67, 8.8, 8.53, 8.65, 9.09, 9.09		Mains Flushing, pH correction	
24/1, 15/2, 14/3	**Perseverance St west Wyalong**	Temperature	30.3, 26, 27			
5/8, 2/9, 26/10, 23/11, 24/1, 15/2, 14/3, 10/5	**West Wyalong Public School**	pH	8.67, 8.6, 8.79, 8.74, 8.67, 8.54, 8.65, 8.9,		Mains Flushing/ Cleaning, pH correction	Near end of the line of Oura
24/1, 15/2, 14/3	**West Wyalong Public School**	Temperature	27, 29.5, 27			
5/8, 2/9, 26/10, 23/11, 24/1, 15/2,	**West Wyalong Terminal Storage**	pH	8.7, 8.7, 8.71, 8.6, 8.77, 8.63, 8.64, 8.95, 8.87		Mains Flushing, pH correction	Near end of line of Oura

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Date	Location	Parameter	Exceedance	Correction	Preventive action	Notes
14/3, 10/5, 7/6						
15/2, 15/2, 18/2, 21/2, 5/3, 9/3, 14/3	**West Wyalong Terminal Storage**	Temperature	26.6, 27, 26.4, 25.9, 26.2, 25.7, 26			
5/8, 2/9, 26/10, 23/11, 13/12, 24/1, 15/2, 14/3, 10/5,	**Calleen reservoir Outlet**	pH	8.91, 8.7, 8.91, 8.92, 8.87, 8.83, 8.97, 8.88, 9.12,		Mains Flushing/ Cleaning, pH correction	Near end of line of the Oura system
15/2	**Calleen reservoir Outlet**	Temperature	26.6			
5/8, 2/9, 26/10, 23/11, 13/12, 24/1, 15/2, 14/3, 10/5,	**Ungarie town res**	pH	9.01, 8.95, 8.91, 9.12, 9.05, 9.09, 9.18, 9.22, 9.35		Mains Flushing/ Cleaning, pH correction	Ungarie is the end of a long distribution system
5/1, 10/1, 17/1, 25/1, 24/1, 11/2, 15/2, 18/2, 21/2, 25/3	**Ungarie town res**	Temperature	25.9, 25.4, 25.5, 25.4, 26.5, 25.3, 27.6, 25.1, 25.5, 25.3			
14/12, 23/12, 5/1, 7/1, 10/1, 17/1, 25/1, 31/1, 3/2, 9/2, 11/2, 16/2, 18/2, 21/2, 1/3, 5/3, 7/3, 14/3, 21/3, 25/3, 29/3, 1/4, 4/4	**Bing Waller Park, Ungarie**	Temperature	27.2, 28.9, 30.1, 30.8, 30.3, 31.8, 26.2, 31, 26.8, 26.4, 27.8, 32.3, 31.3, 28.5, 31.1, 29.6, 28.2, 25.8, 28.5, 27.8, 25.8, 26.5, 25.1			
5/8, 26/10, 23/11, 13/12, 24/1, 15/2, 14/3	**Ungarie central School**	pH	8.97, 8.91, 8.97, 8.99, 9, 9.05, 9		Mains Flushing/ Cleaning, pH correction	End of a long system

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13/12, 24/1, 15/2, 14/3	**Ungarie central School**	Temperature	28.5, 31, 27, 28			
25/8, 3/9, 18/10, 12/11, 16/11, 8/12, 10/1, 18/1, 25/1, 14/3, 6/4, 8/4, 14/4, 2/5, 16/5, 25/5, 28/5, 29/5, 4/6, 5/6, 6/6,	**Temora East res**	Free Cl	0.12, 0.06, 0.14, 0.08, 0.11, 0.02, 0.13, 0.02, 0.07, 0.06, 0.02, 0.05, 0.12, 0.19, 0.14, 0.14, 0.18, 0.13, 0.18, 0.17, 0.15,			Water can be from either Oura or Jugiong or both (end of Jugiong scheme)
8/7, 29/7, 27/8, 24/9, 22/10, 10/3, 7/4, 11/5	**Temora East res**	pH	8.7, 8.7, 8.66, 8.84, 8.79, 8.7, 8.55, 8.68			
Mt Arthur Scheme						
21/12, 13/1, 3/2, 24/3, 24/3,	**Matong School**	Free Cl	0.11, 0.14, 0.02, 0.15, 0.07, 0.08	Manual Dose	Monitor	
16/7, 9/10, 5/11, 24/3, 24/3	**Matong School**	pH	9.2, 9.25, 8.79, 9, 9.19			
17/12, 13/1, 3/2, 23/2	**Matong School**	Temperature	28.1, 29, 25.1, 25.9			
22/4,	**Ganmain High Level**	Free Cl	0.11			
17/12, 14/1, 13/1	**Ganmain High Level**	Temperature	26.1, 28, 27.5			
17/12, 13/1, 3/2,	**Hay Industry display Centre Ganmain**	Temperature	29.3, 29.4, 27.3			

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Date	Location	Parameter	Exceedance	Correction	Preventive action	Notes
9/10, 5/11, 3/2, 23/2, 24/3, 28/6	**Coolamon (Allawah Lodge)**	Free Cl	0.08, 0.02, 0.09, 0.02, 0.12, 0.14	Manual Dose	Monitor	
17/12, 13/1	**Coolamon (Allawah Lodge)**	Temperature	26.5, 29			
9/10, 5/11, 3/2, 23/2, 28/6	**Coolamon Central School**	Free Cl	0.08, 0.02, 0.09, 0.02, 0.12, 0.14			
9/10	**Coolamon Central School**	pH	8.68			
17/12, 20/12, 13/1, 3/2	**Coolamon Central School**	Temperature	28.8, 25.7, 27.2, 25.1			
5/11, 16/3,	**High Level North Coolamon**	Free Cl				
17/12, 14/1, 13/1, 22/1, 28/1	**High Level North Coolamon**	Temperature	26.2, 25.8, 27.2, 25.8, 25.4			
13/1	**"Tolmie" Wagga rd Coolamon**	Temperature	27.5			
17/12	**Ganmain Pre School**	Temperature	26.2			
17/2	**Ganmain Public School**	Temperature	29.2			
6/7 – 28/6 (whole of reporting period)	**Grong Grong Park**	Free Cl	0.02 – 0.42 all samples with exception of 2 were all under 0.2 mg/L			
17/12, 15/1, 13/1, 3/2, 4/2, 23/2	**Grong Grong Park**	Temperature	29.2, 31.5, 31.5, 26.9, 28, 26.9			
22/4, 7/5, 27/5, 28/6,	**Matong Low Level**	Free Cl	0.19, 0.17, 0.18, 0.04			
14/12, 14/1	**Matong Low Level**	Temperature	26.5, 27.5			
9/2,	**Matong Public Toilets**	0.05				
6/7, 12/8, 29/9, 3/11, 25/11, 11/12,	**Grong Grong (town res)**	Free Cl	0.03, 0.1, 0.02, 0.02, 0.02, 0.02, 0.02, 0.02, 0.02,	Manual Dose	Monitor	

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21/12, 4/1, 14/1, 11/5, 31/5, 18/6, 28/6			0.02, 0.02, 0.02, 0.03			
25/11, 21/12, 14/1	**Grong Grong (town res)**	Temperature	25.3, 26.3, 29.2			
16/3, 2/2, 1/3, 16/3	**Coolamon South res**	Free Cl	0.17, 0.18, 0.13, 0.13,			
14/1, 28/1	**Coolamon South res**	Temperature	25.9, 25.8			
9/2,	**Matong High res**	Free Cl	0.15			
14/1, 15/1	**Matong High res**	temperature	28, 26.8			
Mt Daylight Scheme						
24/11, 26/11, 3/12, 7/12, 18/12, 21/12, 22/12, 24/12, 29/12, 4/1, 12/1, 20/1, 21/1, 15/2, 19/2, 22/2, 23/2, 1/3, 5/3, 9/3, 12/3, 15/3,	**Hannan Res**	Temperature	25.1, 26.5, 25.8, 25.2, 26.4, 26.2, 25.6, 26, 26.3, 26.1, 27.8, 26.3, 27.7, 26.5, 27.5, 28.7, 25.6, 27, 26.6, 26.9, 26.8, 25.4			
24/11, 26/11, 3/12, 18/12, 21/12, 24/12, 29/12, 4/1, 9/1, 12/1, 20/1, 21/1, 27/1, 12/2, 15/2, 19/2, 22/2, 23/2, 1/3, 9/3, 12/3	**Naradhan res Outlet**	Temperature	25.1, 27, 25.3, 25.3, 26.3, 25.5, 25.8, 25.9, 25.1, 26.6, 26.7, 27.8, 28.1, 25.9, 25.7,25.7, 27.1, 26.7, 26			
8/7, 7/10, 7/12, 17/3, 26/3, 1/6,	**North Weethalle Res**	Free Cl	0.17, 0.16, 0.18, 0.17, 0.13,	Manual Dose	Monitor	

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25/11, 21/12, 24/12, 29/12, 4/1, 12/1, 18/1, 20/1, 21/1, 27/1, 15/2, 22/2, 23/2, 1/3, 5/3, 9/3, 12/3	**North Weethalle Res**	Temperature	25.3, 25.5, 25.5, 25.8, 25.5, 26.2, 26.9, 27.2, 26.7, 29.2, 26.1, 27.7, 25.4, 26.5, 25.9, 26, 26.1			
8/7, 7/10, 29/10, 29/10, 2/11, 9/11, 24/11, 3/12, 7/12, 22/12, 24/12, 12/1, 21/1, 23/2, 12/3, 26/3, 8/4, 13/4, 21/5, 24/5, 1/6, 28/6	**Russell trading Weethalle**	Free Cl	0.11, 0.1, 0.12, 0.19, 0.18, 0.16, 0.1, 0.1, 0.07, 0.1, 0.15, 0.15, 0.1, 0.14, 0.18, 0.13, 0.18, 0.11, 0.12, 0.15, 0.1, 0.15	Manual Dose	Monitor	
16/11, 24/11, 25/11, 3/12, 7/12, 11/12, 18/12, 21/12, 22/12, 24/12, 29/12, 4/1, 9/1, 12/1, 21/1, 27/1, 12/2, 15/2, 19/2, 22/2, 23/2, 1/3, 5/3, 9/3, 12/3, 15/3, 17/3, 22/3,	**Russell trading Weethalle**	Temperature	25.8, 27.7, 28.3, 27.8, 28.1, 25.3, 26.8, 27.8, 27, 27.6, 29.1, 28.8, 27.8, 28.8, 30.7, 31.1, 26.9, 28.3, 29.2, 30.6, 26.1, 28.5, 26, 28.8, 28.8, 26.5, 25.6, 25.8			
3/12, 26/3, 21/5, 1/6,	**Nariah Res**	Free Cl	0.15, 0.05, 0.1, 0.05	Manual Dose	Monitor	
16/1, 21/1, 27/1, 22/2, 1/3, 9/3	**Nariah Res**	Temperature	26, 25.8, 27.7, 26.1, 26.5, 25.2			

Goldenfields Water

Drinking Water Management System

Annual Report 2021/22

Date	Location	Parameter	Exceedance	Correction	Preventive action	Notes
7/10, 29/10, 2/11, 24/11, 7/12, 11/12, 4/1, 12/1, 12/3, 15/6	**Tallimba Park**	Free Cl	0.18, 0.18, 0.15, 0.17, 0.15, 0.12, 0.15, 0.1, 0.1	Manual Dose	Monitor	
16/11, 24/11, 25/11, 3/12, 7/12, 11/12, 18/12, 21/12, 24/12, 9/1, 12/1, 20/1, 27/1, 12/2, 15/2, 19/2, 22/2, 23/2, 1/3, 8/3	**Tallimba Park**	Temperature	25.2, 25.2, 25.4, 25.3, 25.7, 25.3, 25.7, 25.9, 26, 26.1, 27.5, 27.2, 30.3, 27.5, 26, 27.5, 28.8, 25.9, 26.9, 26			
17/3	**Tallimba School**	Free Cl	0.09			
22/12, 21/1	**Tallimba School**	Temperature	27.2, 26.5			
2/9	**Tallimba Inn**	Free Cl	0.18			
21/9, 16/11, 7/12, 4/1, 20/1, 9/3, 26/3, 21/5,	**Nobbies Res**	Free Cl	0.09, 0.18, 0.05, 0.1, 0.19, 0.19, 0.05, 0.1			
3/12, 18/12, 29/12, 4/1, 12/1, 20/1, 27/1, 27/1, 12/2, 22/2, 22/2, 1/3, 5/3, 9/3, 15/3,	**Nobbies Res**	Temperature	25.3, 25.1, 25.9, 25.4, 26.3, 26.6, 25.8, 29.4, 25.9, 27.8, 27.8, 28, 25.9, 25.8, 25.7	Manual Dose	Monitor	
24/9, 7/10, 7/12, 12/3, 21/5, 1/6,	**Weethalle Res**	Free Cl	0.1, 0.19, 0.18, 0.15, 0.15, 0.09	Manual Dose	Monitor	
3/12, 18/12, 21/12, 24/12, 29/12, 4/1, 12/1, 20/1, 27/1, 12/2,	**Naradhan Steel res**	Temperature	25.6, 25.4, 26.2, 25.5, 25.3, 26, 26.6, 26.7, 28.1, 25.9, 25.7, 26.2, 27.1, 26.7, 25.3, 26.7, 26			

Goldenfields Water

Drinking Water Management System

Annual Report 2021/22

Date	Location	Parameter	Exceedance	Correction	Preventive action	Notes
15/2, 19/5, 22/2, 1/3, 5/3, 9/3, 12/3						
16/11, 24/11, 3/12, 18/12, 21/12, 24/12, 29/12, 9/1, 20/1, 27/1, 15/2, 19/2, 22/2, 1/3, 5/3, 9/3, 12/3, 15/3, 6/4, 8/4	**Naradhan Park**	Temperature	25.1, 26.2, 28.9, 27.5, 28.2, 26.8, 26.6, 26.3, 30.1, 26.9, 27.2, 30.1, 27.5, 26.9, 27.2, 30.1, 27.5, 26.9, 27.2, 26.2, 27.3, 25.6, 25.3			
3/12, 18/12, 21/12, 24/12, 29/12, 20/1, 22/2, 1/3, 9/3, 12/3, 15/3	**Naradhan Pump Station**	Temperature	25.1, 25.6, 25.2, 26, 25.5, 26.2, 26.1, 25.7, 25.9, 26.1, 25.4			

Water Quality Discussion

Throughout the reporting period GWCC have conducted a total of 1296 microbial water samples to be either tested by NSW Health or tested ‘in-house’ by GWCC Water Quality staff.

The water is also tested throughout the reporting period for chemicals which may be present in the water, a total of 186 water samples were collected and tested for chemicals during the reporting period all were tested by NSW Health FASS Lab, Not all samples were compliant and within Australian Drinking Water Guideline limits (AWDG). See table 12 for a summary of the non-compliant parameters and from what scheme the sample were undertaken.

Another initiative undertaken by GWCC in the monitoring of chlorine within the distribution system across the entire scheme. These tests are conducted routinely by the distribution staff and a total of 3165 chlorine test were conducted onsite. These tests include both Total and Free chlorine.

*Results are now entered into WaterOutlook and no longer manually entered into the chlorine history spreadsheet.

A review of the water quality monitoring was conducted by Atom consulting in 2018 and the recommendations were adopted and implemented by GWCC.

Additional works with Atom Consulting regarding the facilitation of service level agreements with our Bulk Councils has been undertaken and we have Draft water quality parameters identified for final agreement. A Draft SLA has been developed by a legal advisor with amendments required. It is intended that the Draft document will be presented to both CGRC and Hilltops Councils by December 2022.

The 2021/22 reporting year has seen unprecedented low demand periods. This has significantly impacted our water age across the extremities of our schemes and has resulted in lower, than normal chlorine residuals and an increase in discoloured water complaints, due to precipitated iron and manganese and chlorine decay.

Customer Complaints

Table 15. Customer complaints registered in the 2020/21 reporting period.

Month	Total Complaints	Discoloured Water	Burst Main	Taste/Odour Related	No Supply/Low Pressure	Leaking Meter	Messy or unsafe jobsite	Unable to Isolate meter	Other
Jul-21	8	5			1	1			1
Aug-21	42	42							
Sep-21	29	27			1	1			
Oct-21	30	27			1				2
Nov-21	14	8	2		3				1
Dec-21	43	40			2	1			
Jan-22	39	37					1		1
Feb-22	36	32			4				
Mar-22	19	16	1		1	1			
Apr-22	10	10							
May-22	33	21	2	2	2	4	1		1
Jun-22	36	33	1		1	1			

There was a total of 339 complaints made during the reporting period 2021/22. The majority of complaints that were made pertained to dirty or discoloured water totalling 298 this is an increase of 129 compared to 169 complaints recorded in 2020/21. These complaints allowed staff to determine that certain areas in the Coolamon and Junee areas required attention and from this GWCC has had reservoirs cleaned and dead ends flushed on numerous occasions. GWCC also conducted a study into the Coolamon and related townships to better handle the issue causing customer complaints. It has also allowed GWCC to eliminate the dirty water by eliminating dead ends in certain areas.

In previous years (2019) GWCC has procured the services of No-Des, a contractor that has the ability to clear water mains with no loss of water to the environment. These contractors cleaned approximately 65 km of water mains in the Coolamon and related townships. Whilst undertaking this flushing/cleaning turbidity's throughout the town were recorded as high as 171 NTU, with an average of approximately 25 NTU. Comparing against historical records of the number of complaints, this method has drastically reduced the number of customer complaints received from these areas.

Further to the implementation of automated flushing system on the notorious dead end Kingdom Drive in February 2019, GWCC has received no complaints from customers serviced on this pipeline. As such, the flushing system installed is assisting with handling of customer complaints. The study into discoloured water events found iron and manganese to be the primary cause of complaints in the Coolamon Township whereby investigating into the economic feasibility of installing a treatment plant will next be explored.

Water Quality Incidents

Table 16. Summary of incidents and emergencies, recommendations and preventative actions

Details of Incident/Emergency	Investigation Recommendations	Preventive Action Undertaken
No Water Quality Incidents have been reported for the report period 2021/22	*0*	*NA*

Staff Development and Training

Incident and Emergency Response Training

GWCC have implemented and completed Incident and Emergency response training. This training has been undertaken by relevant staff and stakeholders. GWCC Management have issued a request to NSW Health for funding for scenario training. If funded and facilitated by health GWCC will seek to undertake the training as soon as possible. NOTE: currently internal training is undertaken by Water Quality staff at the Jugiong Water Treatment plant for emergency response management as part of the Pollution Incident Response Management Plan requirements (PIRMP).

Table 17 below indicates all of the training that GWCC staff have undertaken during the reporting period of 2020/21.

Table 17. Full list of staff training for the 2020/21 reporting period.

Name	Course	Completion date	Expiry date	Training Provider
Adam Ryall	Liquefied Chlorine Gas - Level 1	25/06/2021		IXOM
Blake Hingerty	Liquefied Chlorine Gas - Level 1	25/06/2021		IXOM
Dean Wiggins	Liquefied Chlorine Gas - Level 1	25/06/2021		IXOM
Dilrosh Jayawardene	Liquefied Chlorine Gas - Level 1	25/06/2021		IXOM
Jack Fuller	Liquefied Chlorine Gas - Level 1	25/06/2021		IXOM
James Butler	Liquefied Chlorine Gas - Level 1	25/06/2021		IXOM
Jeremy Coleman	Liquefied Chlorine Gas - Level 1	25/06/2021		IXOM
Liam Moston	Liquefied Chlorine Gas - Level 1	25/06/2021		IXOM
Liam Welch	Liquefied Chlorine Gas - Level 1	25/06/2021		IXOM
Matthew Bett	Liquefied Chlorine Gas - Level 1	25/06/2021		IXOM
Ray McCarthy	Liquefied Chlorine Gas - Level 1	25/06/2021		IXOM
Shane Baldry	Liquefied Chlorine Gas - Level 1	25/06/2021		IXOM
Brad Moye	Traffic Controller	21/07/2021	21/07/2023	SafeWork NSW
Brad Moye	Implement Traffic Control Plans	21/07/2021	21/07/2023	SafeWork NSW

Brad Moye	Prepare a work zone	21/07/2021	21/07/2023	SafeWork NSW
Chris Fealy	Liquefied Chlorine Gas - Level 2	16/08/2021	16/08/2024	IXOM
Liam Welch	Liquefied Chlorine Gas - Level 2	16/08/2021	16/08/2024	IXOM
Robin Davis	Liquefied Chlorine Gas - Level 2	16/08/2021	16/08/2024	IXOM
Aaron Burnett	Remove Non Friable Asbestos	16/09/2021		TAFE NSW
Daniel Flack	Remove Non Friable Asbestos	16/09/2021		TAFE NSW
David Chandler	Remove Non Friable Asbestos	16/09/2021		TAFE NSW
Dean Wiggins	Remove Non Friable Asbestos	16/09/2021		TAFE NSW
Jeremy Coleman	Remove Non Friable Asbestos	16/09/2021		TAFE NSW
Justin Kerry	Remove Non Friable Asbestos	16/09/2021		TAFE NSW
Liam Moston	Remove Non Friable Asbestos	16/09/2021		TAFE NSW
Liam Welch	Remove Non Friable Asbestos	16/09/2021		TAFE NSW
Mark New	Remove Non Friable Asbestos	16/09/2021		TAFE NSW
Matthew Cooper	Remove Non Friable Asbestos	16/09/2021		TAFE NSW
Raymond McCarthy	Remove Non Friable Asbestos	16/09/2021		TAFE NSW
Sean Tiernan	Remove Non Friable Asbestos	16/09/2021		TAFE NSW
Geoff Veneris	Creating High Performance Habits	9/11/2021		LG Professionals
Ali Wood	Creating High Performance Habits	9/11/2021		LG Professionals
Annie Coleman	Creating High Performance Habits	9/11/2021		LG Professionals
Nicol Kelly	Creating High Performance Habits	9/11/2021		LG Professionals
Gerard Carr	Creating High Performance Habits	9/11/2021		LG Professionals
Rahul Patil	Creating High Performance Habits	9/11/2021		LG Professionals
Shane Baldry	Creating High Performance Habits	9/11/2021		LG Professionals
Tony Corby	Creating High Performance Habits	9/11/2021		LG Professionals
Tony Goodyer	Creating High Performance Habits	9/11/2021		LG Professionals
Sean Tiernan	Creating High Performance Habits	9/11/2021		LG Professionals
Ian Basham	Creating High Performance Habits	9/11/2021		LG Professionals
Aaron Drenovski	Creating High Performance Habits	9/11/2021		LG Professionals

Ray Graham	Creating High Performance Habits	9/11/2021		LG Professionals
Sammy Jung	Creating High Performance Habits	9/11/2021		LG Professionals
Ian Basham	CPR	10/11/2021	10/11/2022	JB Hunter
Aaron Burnett	CPR	10/11/2021	10/11/2022	JB Hunter
James Butler	CPR	10/11/2021	10/11/2022	JB Hunter
James Butler	CPR	10/11/2021	10/11/2022	JB Hunter
Annie Coleman	CPR	10/11/2021	10/11/2022	JB Hunter
Jeremy Coleman	CPR	10/11/2021	10/11/2022	JB Hunter
Matthew Cooper	CPR	10/11/2021	10/11/2022	JB Hunter
Andrew Derrick	CPR	10/11/2021	10/11/2022	JB Hunter
Mick Diggins	CPR	10/11/2021	10/11/2022	JB Hunter
Rob Drummond	CPR	10/11/2021	10/11/2022	JB Hunter
Daniel Flack	CPR	10/11/2021	10/11/2022	JB Hunter
Chris Fealy	CPR	10/11/2021	10/11/2022	JB Hunter
Brendon Ford	CPR	10/11/2021	10/11/2022	JB Hunter
Shane Hartshorn	CPR	10/11/2021	10/11/2022	JB Hunter
Michael Lewis	CPR	10/11/2021	10/11/2022	JB Hunter
Jeremy Coleman	LVR	10/11/2021	10/11/2022	JB Hunter
Ian Basham	Work Safely Near Powerlines	10/11/2021	10/11/2022	JB Hunter
Aaron Burnett	Work Safely Near Powerlines	10/11/2021	10/11/2022	JB Hunter
James Butler	Work Safely Near Powerlines	10/11/2021	10/11/2022	JB Hunter
David Chandler	Work Safely Near Powerlines	10/11/2021	10/11/2022	JB Hunter
Jeremy Coleman	Work Safely Near Powerlines	10/11/2021	10/11/2022	JB Hunter
Matthew Cooper	Work Safely Near Powerlines	10/11/2021	10/11/2022	JB Hunter
Andrew Derrick	Work Safely Near Powerlines	10/11/2021	10/11/2022	JB Hunter
Mick Diggins	Work Safely Near Powerlines	10/11/2021	10/11/2022	JB Hunter
Rob Drummond	Work Safely Near Powerlines	10/11/2021	10/11/2022	JB Hunter
Daniel Flack	Work Safely Near Powerlines	10/11/2021	10/11/2022	JB Hunter
Chris Fealy	Work Safely Near Powerlines	10/11/2021	10/11/2022	JB Hunter
Shane Hartshorn	Work Safely Near Powerlines	10/11/2021	10/11/2022	JB Hunter
Michael Lewis	Work Safely Near Powerlines	10/11/2021	10/11/2022	JB Hunter
Shane Bladry	CPR	11/11/2021	11/11/2022	JB Hunter
Shane Barrett	CPR	11/11/2021	11/11/2022	JB Hunter
Dilrosh Jayawardene	CPR	11/11/2021	11/11/2022	JB Hunter

Ray McCarthy	CPR	11/11/2021	11/11/2022	JB Hunter
Liam Moston	CPR	11/11/2021	11/11/2022	JB Hunter
Rod Ryan	CPR	11/11/2021	11/11/2022	JB Hunter
Les Scott	CPR	11/11/2021	11/11/2022	JB Hunter
Chris Scott	CPR	11/11/2021	11/11/2022	JB Hunter
Barry Shepherd	CPR	11/11/2021	11/11/2022	JB Hunter
Sean Tiernan	CPR	11/11/2021	11/11/2022	JB Hunter
Liam Welch	CPR	11/11/2021	11/11/2022	JB Hunter
Dean Wiggins	CPR	11/11/2021	11/11/2022	JB Hunter
Shane Baldry	LVR	11/11/2021	11/11/2022	JB Hunter
Dilrosh Jayawardene	LVR	11/11/2021	11/11/2022	JB Hunter
Ray McCarthy	LVR	11/11/2021	11/11/2022	JB Hunter
Liam Moston	LVR	11/11/2021	11/11/2022	JB Hunter
Rod Ryan	LVR	11/11/2021	11/11/2022	JB Hunter
Les Scott	LVR	11/11/2021	11/11/2022	JB Hunter
Dean Wiggins	LVR	11/11/2021	11/11/2022	JB Hunter
Shane Bladry	Work Safely Near Powerlines	11/11/2021	11/11/2022	JB Hunter
Shane Barrett	Work Safely Near Powerlines	11/11/2021	11/11/2022	JB Hunter
Dilrosh Jayawardene	Work Safely Near Powerlines	11/11/2021	11/11/2022	JB Hunter
Ray McCarthy	Work Safely Near Powerlines	11/11/2021	11/11/2022	JB Hunter
Liam Moston	Work Safely Near Powerlines	11/11/2021	11/11/2022	JB Hunter
Rod Ryan	Work Safely Near Powerlines	11/11/2021	11/11/2022	JB Hunter
Les Scott	Work Safely Near Powerlines	11/11/2021	11/11/2022	JB Hunter
Chris Scott	Work Safely Near Powerlines	11/11/2021	11/11/2022	JB Hunter
Barry Shepherd	Work Safely Near Powerlines	11/11/2021	11/11/2022	JB Hunter
Sean Tiernan	Work Safely Near Powerlines	11/11/2021	11/11/2022	JB Hunter
Liam Welch	Work Safely Near Powerlines	11/11/2021	11/11/2022	JB Hunter
Dean Wiggins	Work Safely Near Powerlines	11/11/2021	11/11/2022	JB Hunter
Blake Hingerty	CPR	12/11/2021	12/11/2022	JB Hunter
Blake Hingerty	LVR	12/11/2021	12/11/2022	JB Hunter
Blake Hingerty	Work Safely Near Powerlines	12/11/2021	12/11/2022	JB Hunter
Mike Read	Aeronautical Radio Operator Certificate	17/11/2021		Global Drone Solutions
Chris Breen	CPR	30/11/2021	30/11/2022	JB Hunter
Robin Davis	CPR	30/11/2021	30/11/2022	JB Hunter
Nicol Kelly	CPR	30/11/2021	30/11/2022	JB Hunter

Justin Kerry	CPR	30/11/2021	30/11/2022	JB Hunter
Justin Kerry	Work Safely Near Powerlines	30/11/2021	30/11/2022	JB Hunter
Christine Roberts	Emergency Procedures For Temora	2/12/2021		Goldenfields Water
Libby Kite	Emergency Procedures For Temora	2/12/2021		Goldenfields Water
Ray Graham	Emergency Procedures For Temora	2/12/2021		Goldenfields Water
Michael Annetts	CPR	3/12/2021	3/12/2022	JB Hunter
Michael Annetts	Work Safely Near Powerlines	3/12/2021	3/12/2022	JB Hunter
Kylie Crouch	Provide First Aid	15/12/2021	15/12/2024	TAFE NSW
Jeremy Coleman	Provide First Aid	15/12/2021	15/12/2024	TAFE NSW
Tony Corby	Provide First Aid	15/12/2021	15/12/2024	TAFE NSW
Michele Curran	Provide First Aid	15/12/2021	15/12/2024	TAFE NSW
Libby Kite	Provide First Aid	15/12/2021	15/12/2024	TAFE NSW
Les Scott	Provide First Aid	15/12/2021	15/12/2024	TAFE NSW
Andrew Haley	Provide First Aid	15/12/2021	15/12/2024	TAFE NSW
Dean Wiggins	Provide First Aid	15/12/2021	15/12/2024	TAFE NSW
David Chandler	Provide First Aid	15/12/2021	15/12/2024	TAFE NSW
Mitchell Farlow	Provide First Aid	15/12/2021	15/12/2024	TAFE NSW
Kate Lowe	Provide First Aid	15/12/2021	15/12/2024	TAFE NSW
Nigel Marion	Remote Pilot Licence	21/03/2022		Global Drone Solutions
Nigel Marion	Aeronautical Radio Operator Certificate	21/03/2022		Global Drone Solutions
Sonya Kovacevic	Working at Heights	30/03/2022	30/03/2024	Just Careers Training
Mitchell Farlow	Working at Heights	30/03/2022	30/03/2024	Just Careers Training
Sonya Kovacevic	Confined Spaces	31/03/2022	31/03/2024	Just Careers Training
Michell Farlow	Confined Spaces	31/03/2022	31/03/2024	Just Careers Training
Chris Fealy	Working at Heights	12/04/2022	12/04/2024	Raise Training
Jack Fuller	Working at Heights	12/04/2022	12/04/2024	Raise Training
Shane Hartshorn	Working at Heights	12/04/2022	12/04/2024	Raise Training
Bailey Lowes	Working at Heights	12/04/2022	12/04/2024	Raise Training
Liam Moston	Working at Heights	12/04/2022	12/04/2024	Raise Training
Liam Pattison	Working at Heights	12/04/2022	12/04/2024	Raise Training
Michael Read	Working at Heights	12/04/2022	12/04/2024	Raise Training
Shane Baldry	Working at Heights	13/04/2022	13/04/2024	Raise Training
James Butler	Working at Heights	13/04/2022	13/04/2024	Raise Training
Matthew Cooper	Working at Heights	13/04/2022	13/04/2024	Raise Training
Blake Hingerty	Working at Heights	13/04/2022	13/04/2024	Raise Training
Stephen Ledgard	Working at Heights	13/04/2022	13/04/2024	Raise Training
Bradley Moye	Working at Heights	13/04/2022	13/04/2024	Raise Training
Adam Ryall	Working at Heights	13/04/2022	13/04/2024	Raise Training
Rod Ryan	Working at Heights	13/04/2022	13/04/2024	Raise Training

Shane Barrett	Working at Heights	14/04/2022	14/04/2024	Raise Training
David Chandler	Working at Heights	14/04/2022	14/04/2024	Raise Training
Andrew Derrick	Working at Heights	14/04/2022	14/04/2024	Raise Training
Daniel Flack	Working at Heights	14/04/2022	14/04/2024	Raise Training
Dilrosh Jayawardene	Working at Heights	14/04/2022	14/04/2024	Raise Training
Nigel Marion	Working at Heights	14/04/2022	14/04/2024	Raise Training
Ray McCarthy	Working at Heights	14/04/2022	14/04/2024	Raise Training
Liam Welch	Working at Heights	14/04/2022	14/04/2024	Raise Training
Chris Fealy	AQF3	31/05/2022	31/05/2027	ChemCert
Chris Scott	AQF3	31/05/2022	31/05/2027	ChemCert
David Chandler	AQF3	31/05/2022	31/05/2027	ChemCert
Stephen Ledgard	AQF3	31/05/2022	31/05/2027	ChemCert
Barry Shepherd	AQF3	31/05/2022	31/05/2027	ChemCert
Rob Davis	AQF3	31/05/2022	31/05/2027	ChemCert
Matthew Cooper	AQF3	31/05/2022	31/05/2027	ChemCert
Chris Breen	Safety Trailer Familiarisation Session	16/06/2022		Mick Humphries Training Group
Dilrosh Jayawardene	Safety Trailer Familiarisation Session	16/06/2022		Mick Humphries Training Group
Dean Wiggins	Safety Trailer Familiarisation Session	16/06/2022		Mick Humphries Training Group
Jack Fuller	Safety Trailer Familiarisation Session	16/06/2022		Mick Humphries Training Group
Rod Ryan	Safety Trailer Familiarisation Session	16/06/2022		Mick Humphries Training Group
Blake Hingerty	Safety Trailer Familiarisation Session	16/06/2022		Mick Humphries Training Group
Tony Corby	Safety Trailer Familiarisation Session	16/06/2022		Mick Humphries Training Group
Mitch Farlow	Safety Trailer Familiarisation Session	16/06/2022		Mick Humphries Training Group
Ian Basham	Safety Trailer Familiarisation Session	16/06/2022		Mick Humphries Training Group
Chris Fealy	Safety Trailer Familiarisation Session	16/06/2022		Mick Humphries Training Group
Ray McCarthy	Safety Trailer Familiarisation Session	16/06/2022		Mick Humphries Training Group
Jeremy Coleman	Safety Trailer Familiarisation Session	16/06/2022		Mick Humphries Training Group
James Butler	Safety Trailer Familiarisation Session	21/06/2022		Mick Humphries Training Group
Les Scott	Safety Trailer Familiarisation Session	21/06/2022		Mick Humphries Training Group
Bailey Lowes	Safety Trailer Familiarisation Session	21/06/2022		Mick Humphries Training Group
Mike Read	Safety Trailer Familiarisation Session	21/06/2022		Mick Humphries Training Group
Sonya Kovacevic	Safety Trailer Familiarisation Session	21/06/2022		Mick Humphries Training Group
Andrew Derrick	Safety Trailer Familiarisation Session	21/06/2022		Mick Humphries Training Group

Liam Welch	Safety Trailer Familiarisation Session	21/06/2022		Mick Humphries Training Group
David Chandler	Safety Trailer Familiarisation Session	21/06/2022		Mick Humphries Training Group
Mick Diggins	Safety Trailer Familiarisation Session	21/06/2022		Mick Humphries Training Group
Brad Moye	Safety Trailer Familiarisation Session	21/06/2022		Mick Humphries Training Group
Barry Shepherd	Safety Trailer Familiarisation Session	21/06/2022		Mick Humphries Training Group
Isaac Reardon	Safety Trailer Familiarisation Session	21/06/2022		Mick Humphries Training Group
Robin Davis	Safety Trailer Familiarisation Session	29/06/2022		Mick Humphries Training Group
Stehpen Ledgard	Safety Trailer Familiarisation Session	29/06/2022		Mick Humphries Training Group
Rod Brummond	Safety Trailer Familiarisation Session	29/06/2022		Mick Humphries Training Group
Liam Pattison	Safety Trailer Familiarisation Session	29/06/2022		Mick Humphries Training Group
Sean Tiernan	Safety Trailer Familiarisation Session	29/06/2022		Mick Humphries Training Group
Shane Hartshorn	Safety Trailer Familiarisation Session	29/06/2022		Mick Humphries Training Group
Matthew Cooper	Safety Trailer Familiarisation Session	29/06/2022		Mick Humphries Training Group
Chris Scott	Safety Trailer Familiarisation Session	29/06/2022		Mick Humphries Training Group
Shane Baldry	Safety Trailer Familiarisation Session	29/06/2022		Mick Humphries Training Group
Mark Carroll	Safety Trailer Familiarisation Session	29/06/2022		Mick Humphries Training Group

Continuous Improvement Plan

Table 18 below is a summary of all items in the Continuous Improvement plan that have been completed or actioned during the 2021/22 reporting period.

Table 18. Continuous improvement plan activities that have progressed, been completed, or been added during the period 2021/22

Action no.	Item	Progress	Date for completion	Who is responsible
16	*GWCC to consider and investigate and install the most suitable Back Flow prevention device on the connection between Oura and Hylands Bridge (e.g.RPZD, Break tank with air gap)*	*A stop valve and non return valve has been put in place to reduce any risk of backflow - Complete*	*November 22*	*Manager Engineering*
29	*GWCC to consider installing online chlorine residual analyser at outlet of settling tanks to ensure*	*magflow and analysers installed however not connected to clearscada system – Mt Arthur SCADA/Telemetry network to commence upgrade in 2022/23 financial year. Connection of*	*July 2023*	*Manager Engineering*

Action no.	Item	Progress	Date for completion	Who is responsible
	30 minutes contact time (Mt Arthur system)	*water quality instrumentation to be completed after this. In progress*		
76	*Bulk Service Level Agreements (SLA)*	*Draft SLA completed and currently under review. Change in staff at Bulk councils has made it difficult to resolve outstanding items for agreement – In progress*	*July 23*	*Manager Production and Services*

Review of DWMS Implementation

Adoption of the Drinking water Management System occurred in February 2018 and the implementation has been reviewed annually. In addition to our regular annual reviews, GWCC engaged their Internal Auditor, National Audits Group to undertake a review of Councils DWMS and its associated governance and reporting requirements. Results of this Audit are provided in Appendix D below.

Table 19. Summary of internal reviews

Date	Reviewer	Scope	Findings	Actions
3/10/2019	*Geoff Veneris and Chris Breen*	*Drinking Water Policy*	*Fully Compliant – Council reviewed and endorsed the water policy on 23/08/19.*	*No Action required*
FY 2019/20	*Geoff Veneris and Chris Breen*	*Verification Monitoring*	*Council has undertaken all required verification monitoring*	*Continual compliance with NSW Health*
FY 2020/21	*Geoff Veneris and Chris Breen*	*Operational Monitoring*	*GWCC has conducted extensive Operational Monitoring of all Water Source schemes (see Water Quality Section for breakdown of monitoring)*	*Continued Monitoring of all water source scheme Review of current sampling runs are needed*
FY 2021/22	*Geoff Veneris and Chris Breen*	*Operational Monitoring*	*GWCC has conducted extensive Operational Monitoring of all Water Source schemes (see Water Quality Section for breakdown of monitoring)*	*Continued Monitoring of all water source scheme Review of current sampling runs are needed*

Table 20. Summary of external reviews.

Date	Reviewer	Scope	Findings	Actions
June 2019	*National Audits Group*	*To review the effectiveness of Council's water quality systems and monitoring procedures and to assess compliance with the ADWG*	*Table 39*	*Complete*

Reservoir inspections

GWCC conducted regular reservoir inspections throughout the reporting period. They have a schedule for weekly 'drive by' inspections, as well as a more detailed inspection regime that is carried out on a quarterly basis. Any issues found with the weekly or quarterly inspections are entered into a spreadsheet/database (CM9 doc number, 20/4023) and the appropriate section is notified of the works that will need to be carried out.

Reservoir inspections are given a priority ranking between 1 and 5, a ranking of 1 being the worst and needing immediate attention, a ranking of 5 being not so important. (At this point an electronic database has not been kept for all inspections). GWCC is currently working to implement the reservoir inspections in WaterOutlook so that all information can be gathered electronically and acted on accordingly.

Reservoir Inspections were also conducted by Aqualift (Councils contracted divers for cleaning and inspection) during the reporting period. A full report of their findings is located in Appendix. C, below is a summary of their report.

Table 21. Summary of reservoir inspections and outcomes

Date	Reservoirs inspected	Findings	Corrective actions
8/11/2021	Bethungra No 1	-There is no effective platform area present to work or rescue off if required - There are no guard rails around the edge of the roof	-Platform and guardrails need to be installed
		- The galvanised post base is corroded and the post is also deteriorated on the water line area.	-An Aquapost is an easy solution to fix the problem
8/11/2021	Bethungra No 2	-There is no effective platform area present to work or rescue off if required - There are no guard rails around the edge of the roof	-Platform and guardrails need to be installed
		- The galvanised post base is corroded and the post is also deteriorated on the water line area.	-An Aquapost is an easy solution to fix the problem

6/11/2021	Black Range	-There is calcification on the walls and significant spalling internally, so the external areas must also be suspect -The entry hatch cover is not sealed around the edges and where the ladder stiles extend through - The platform is not sealed around the entry hatch area - The hatch covers are not sealed around the edges - The level indicator is non functional and should be removed. The roof pulley is creating an entry point for contamination events - There is severe concrete spalling on the upper wall area at 5 oclock. The horizontal reinforcing steel is exposed and heavily corroded. - The overflow riser is corroded - The internal ladder is heavily corroded and is not safe to use if the tank is empty. It should be replaced with a Nextep vertical FRP system 11600mm long - The entry hatch and rescue hatch covers are not sealed around the edges. - There is severe concrete spalling on the upper wall area at 5 oclock. The horizontal reinforcing steel is exposed and heavily corroded. This issue should be addressed ASAP before further structural damage develops. -The internal ladder is heavily corroded and is not safe to use if the tank is empty	-All areas need to be inspected and sealed - It should be replaced with a Nextep vertical FRP system 11600mm long.
8/11/2021	Dirnaseer No 1	- There is no effective platform area present to work or rescue off if required - There are no guard rails around the edge of the roof - One turbine vent is missing, but the opening is closed off	-Platform and guardrails need to be installed

8/11/2021	Dirnaseer No 2	- There is no effective platform area present to work or rescue off if required - There are no guard rails around the edge of the roof - The concrete mound around the post base is breaking up	- Platform and guardrails need to be installed
7/11/2021	Frampton No 1	- There are significant cracks present, particularly around the base areas, where weepage may be occurring - The entry hatch cover is lightweight and could be bent upwards when locked, It is also unsealed around the edges - There is no effective platform area present to work or rescue off if required - There is no ventilation system in place, but the roof edge ridge caps are allowing air flow to occur - The external cracks will be mirrored internally - The post base has corroded through and is only sitting on the floor area - The roof framing has significant corrosion present	-replace with heavier cover -Install platform and guard rails -Investigate ventilation -investigate replacement with new roof -will need to be replaced soon, before the roof fails
7/11/2021	Frampton No2	- There are significant cracks present, particularly around the base areas, where weepage may be occurring - The entry hatch cover is lightweight and could be bent upwards when locked, It is also unsealed around the edges - There is no effective platform area present to work or rescue off if required - There is no ventilation system in place, but the roof edge ridge caps are allowing air flow to occur - The external cracks will be mirrored internally - The post base has corroded through and is only sitting on the floor area - The framing has surface corrosion and is lightweight	-replace with heavier cover -Install platform and guard rails -Investigate ventilation -investigate replacement with new roof
9/11/2021	Illabo No 1	- There are a few minor weeps around the external wall base area - The roof framing has significant corrosion present on the main	-will need to be replaced soon, before the roof fails

		rafters and the wall connection areas, which are uncoated	
9/11/2021	Illabo No 2	- There are a few minor weeps around the external wall base area - The roof framing has significant corrosion present on the main rafters and the wall connection areas, which are uncoated	-will need to be replaced soon, before the roof fails
21/3/2022	Jugiong BT	- The galvanised coating is deteriorated - The existing ladders, platform and upper cage section need to be replaced	-replace with an FRP vertical ladder system when the tank is re-coated
21/3/2022	Jugiong CWT	- The galvanised ladder and platform have corrosion present.	It should be replaced with a Nextep FRP vertical ladder 9300mm long
7/11/2021	Mannings Rd No 1	- The concrete walls have cracks present, but nothing is evident internally. One turbine roof vent appears to have frozen	-replace turbine vent
7/1/2021	Mannings Rd No2	- There is no safe working area on the roof	-investigate platform installation
9/11/2021	Marrar Pinnacle No 1	- The entry hatch is small for a safe diver entry or rescue situation. -An improved guard rail system is also required to upgrade personnel safety around the platform area. - The two main roof beams are un-coated and have heavy surface corrosion present - The galvanised ladder has surface corrosion present.	- It should be enlarged when the platform is upgraded -Upgrade rail system - This should not present a structural issue in the short term (5 years), but they should be monitored for future deterioration - It needs to be replaced with a Nextep FRP ladder 4300mm long.
20/3/2022	Wantabadgery No 1	- The small entry hatch is neither secure against unauthorised access or sealed against contamination ingress. -There are some significant weeping horizontal cracks in the walls which are mirrored internally. The cracks are too numerous to repair - The centre roof support post is heavily corroded	-an internal liner may be a good medium term solution to extend the life of the tank -should be replaced with an Aquapost. The corroded base plate is 400mm square.
20/3/2022	Wantabadgery No 2	- The small entry hatch is neither secure against unauthorised access or sealed against contamination ingress.	

		- The centre roof support post is heavily corroded	-should be replaced with an Aquapost. The corroded base plate is 400mm square.
12/7/2021	West Wyalong Terminal 112	- The external areas appear to be OK - There have been a significant number of patch repairs carried out across the floor, some better than others. There is no obvious corrosion present and CP has been upgraded to a more effective impressed system.	
11/7/2021	Young Terminal 115	- Padlocks are required on both the entry hatch and roof hatch to secure them from unauthorised access. - The upper section of the asbestos cement overflow riser is delaminating	-Place padlocks at both points

Appendix A – Water quality data

Water Quality Graphs

Jugiong Water Treatment Plan

Jugiong Water Treatment Plant data has been represented in the following graphs and commentary. The following data has been taken from the new Water outlook Database that GWCC is currently building with an external party, Safegroup.

Data relevant to Critical Control and operational control is reported as follows:

Chlorine is the main Critical Control Point of the Jugiong WTP used to eliminate chlorine sensitive pathogens, Disinfection.

- The chlorine target leaving the WTP is 1.8mg/L with amber alerts sent if chlorine drops below 1.2mg/L or goes over 2mg/L.
- The alert becomes critical with DWMS protocols implemented when chlorine levels drop below 0.8mg/L in summer and 0.5mg/L in winter. Figure 5 below represents the Finished water chlorine at the Jugiong WTP, both Free and Total. As can be seen GWCC has only exceeded its lower critical limit (<0.5mg/L, winter, <0.8mg/L summer) or its upper critical limit (>5.0mg/L) for Free Chlorine 4 times throughout the reporting period.
- A free/residual chlorine of 0.91mg/L was the lowest recorded result on the 21/8/2021. The highest total cl recorded was on the 15/11/2021 with a value of 2.82mg/L.
- The average Free Chlorine for the reporting year was 1.6mg/L and average Total chlorine reading was 2.0mg/L.

Figure 5. Jugiong chlorine levels for the 2021/22 reporting period

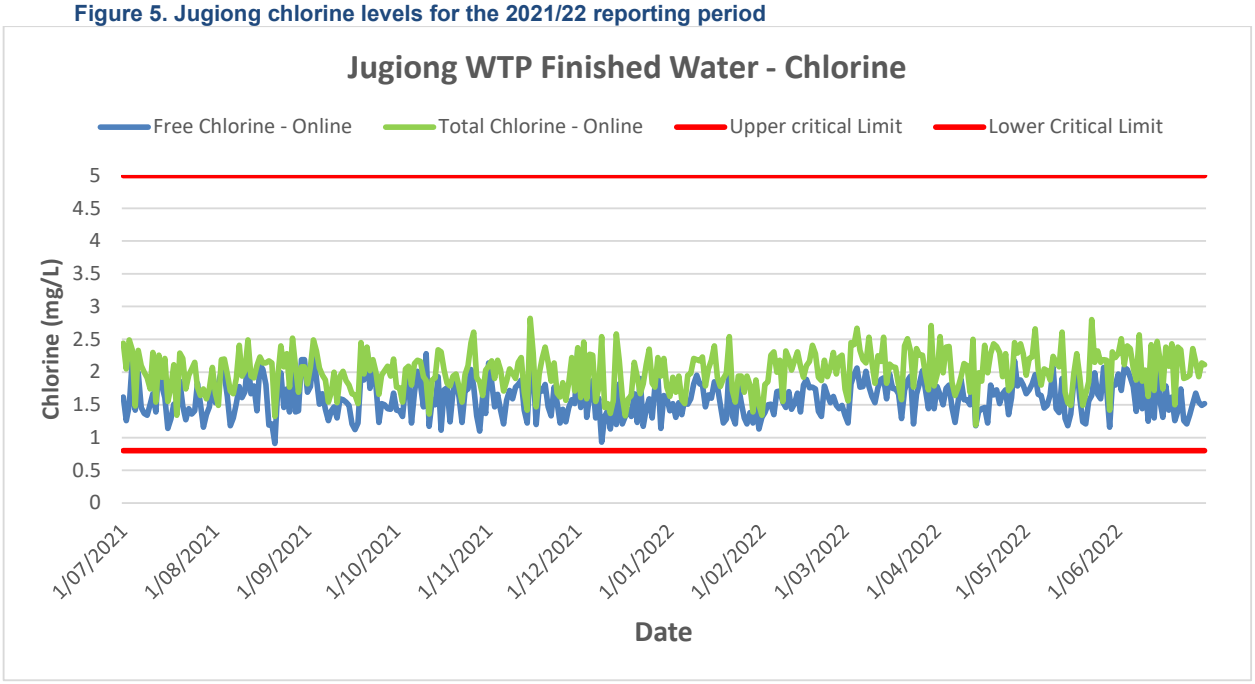


Figure 5 represents the finished water fluoride (Blue line) and Raw Water Fluoride (Green Line) for the Jugiong water treatment plant. Fluoride levels both Raw and Finished has remained consistent throughout the reporting period with a minimum value of 0.15 mg/L (Raw Water concentration) and a maximum value of 1.15 mg/L (Finished water Concentration). The Finished water Fluoride at the Jugiong Water Treatment Plant has exceeded its minimum value of 0.95mg/L on several occasions throughout the reporting period. These exceedances were due to equipment failure or breakdown.

Figure 6. Jugiong fluoride levels for the 2021/22 reporting period

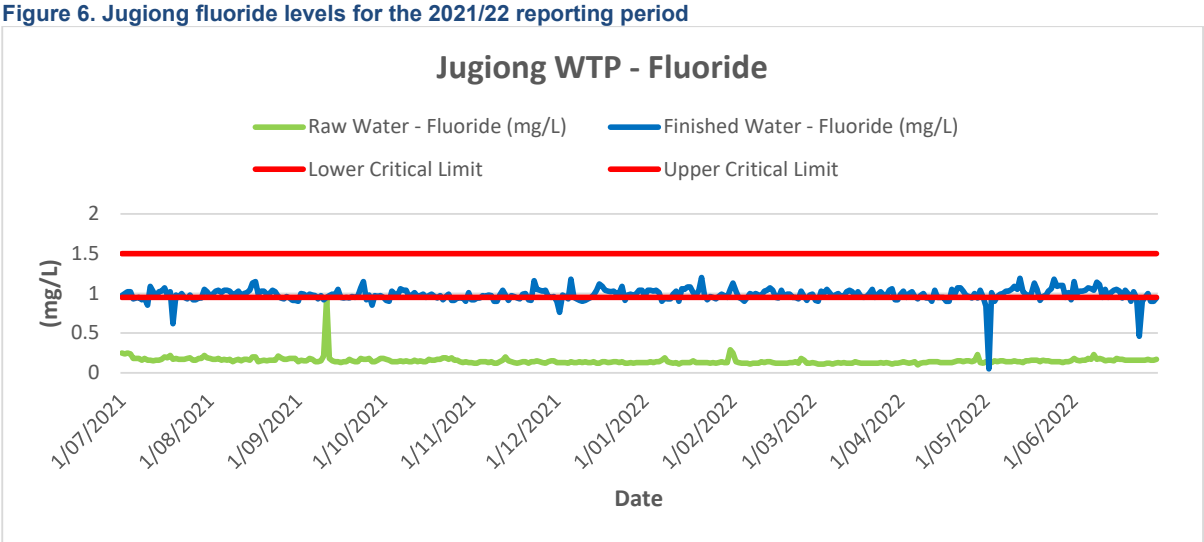


Figure 7. Jugiong raw water turbidity for the 2021/22 reporting period

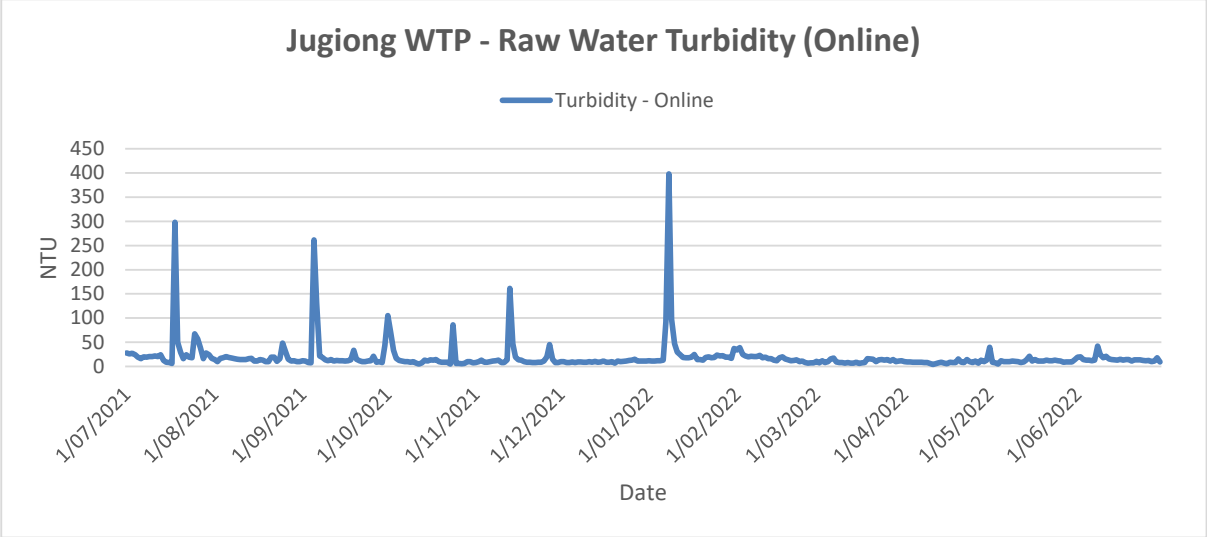


Figure 8. Jugiong finished water turbidity for the 2021/22 reporting period

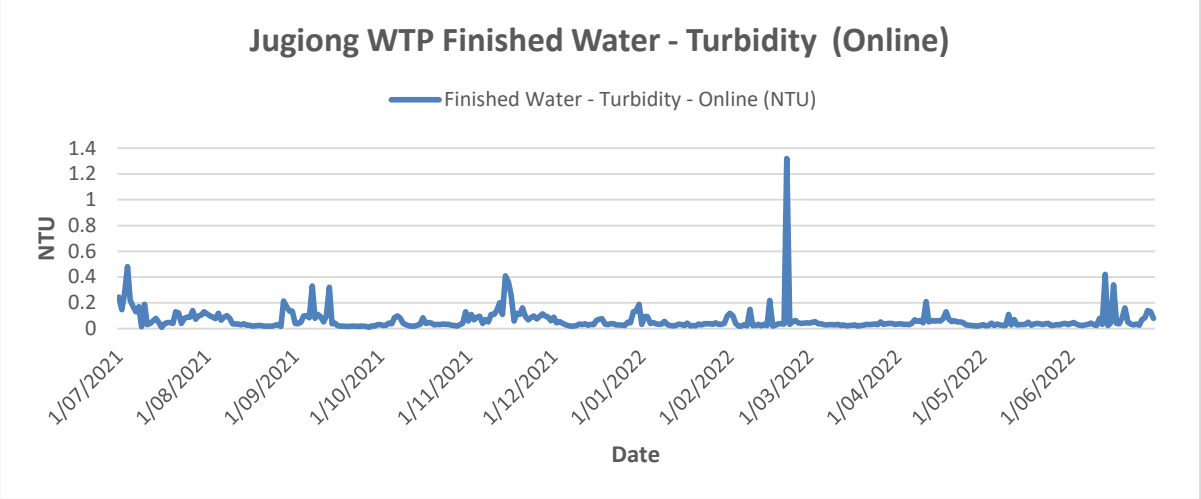
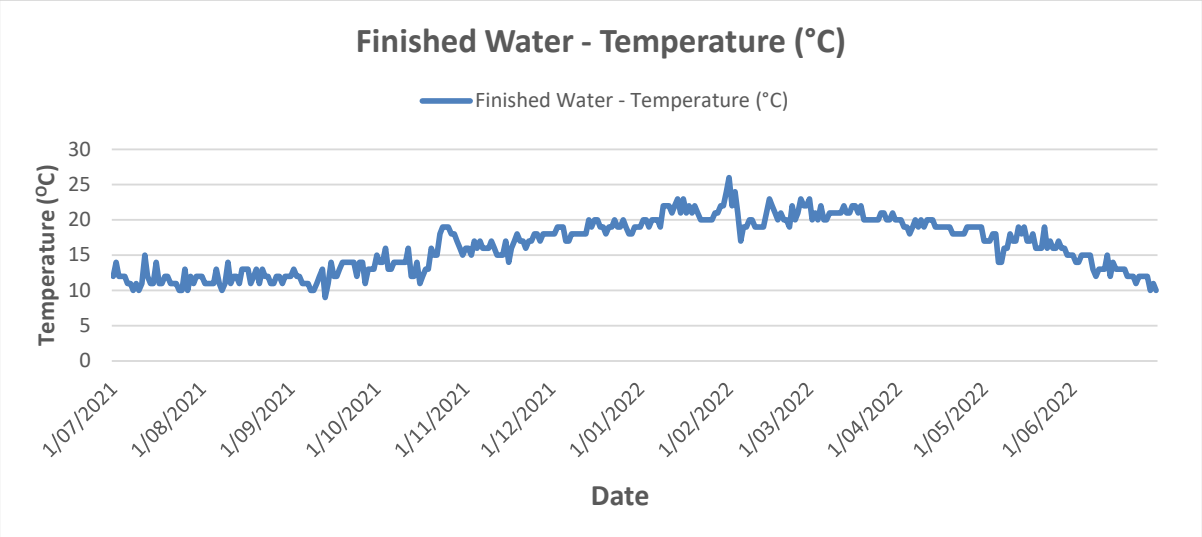


Figure 9. Jugiong finished water temperature for the 2021/22 reporting period



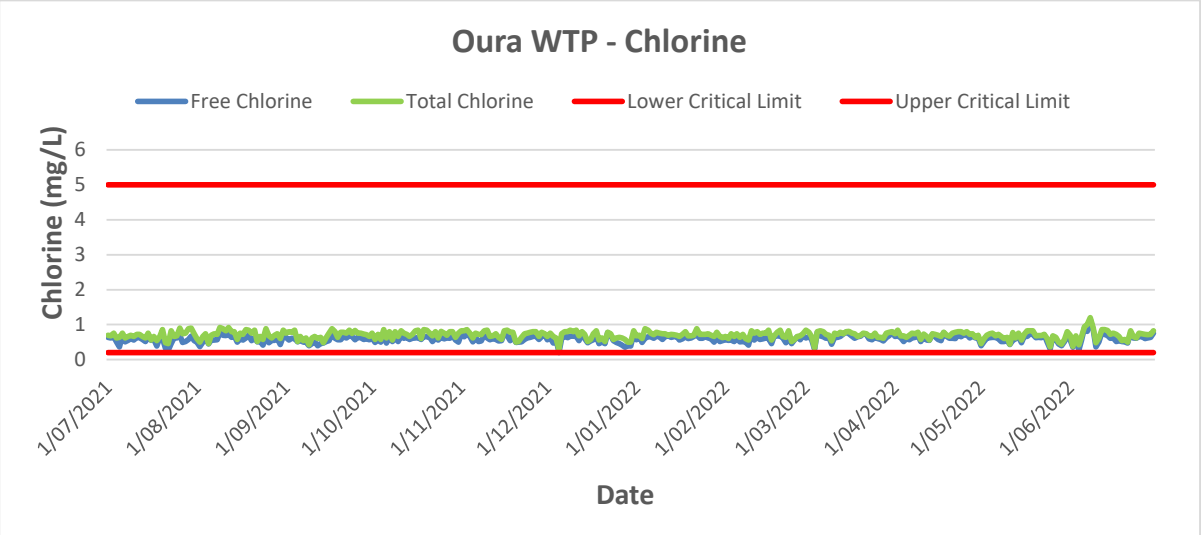
Oura Treatment Plant

Since the implementation of Water Outlook at the Oura WTP some valuable data has been produced. This data is represented in the following graphs produced for the WTP's CCP's.

Chlorine is used at the Oura WTP for disinfection of the ground water extracted from bores in Gumly Borefield. It is used to eliminate chlorine sensitive pathogens, disinfection. The chlorine target for GWCC coming out of the Oura WTP is 0.5 mg/L. An amber alert is issued through WaterOutlook when chlorine level drop below 0.3 mg/L and when they rise above 1.0 mg/L. A critical alarm is issued when chlorine levels drop below 0.2 mg/L and rise above 5mg/L.

Fluoride is also added to the water at the Oura WTP. There is natural Fluoride detected in the water, therefore more is added to meet the NSW Health target range of 0.95mg/L to 1.05mg/L. this information is represented in the graphs below.

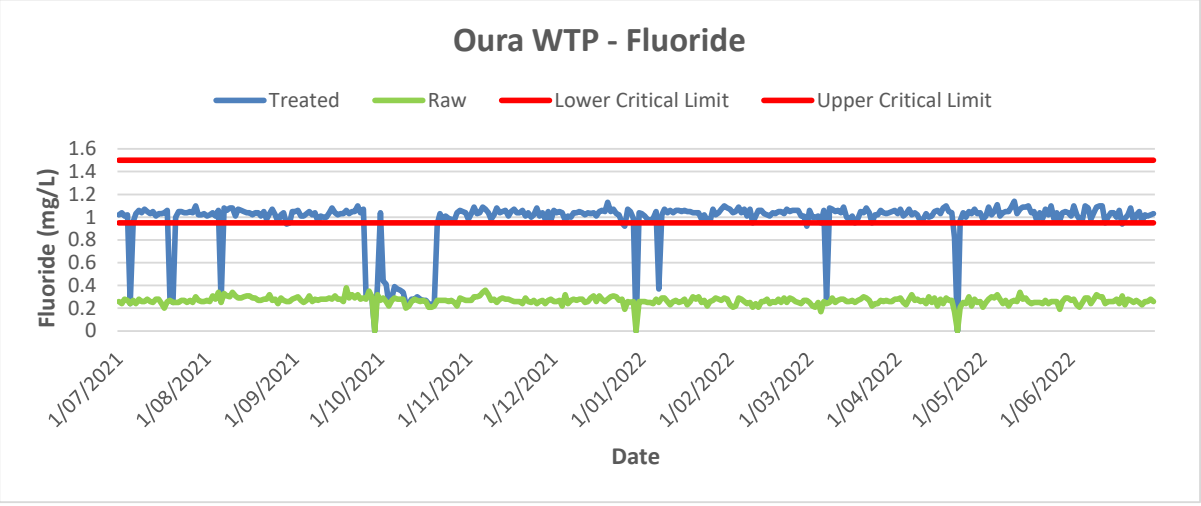
Figure 10. Oura chlorine levels for the 2021/22 reporting period



As can be seen in Figure 10, which uses a logarithmic scale on the vertical axis, the injection of chlorine into the Oura bore water has been extremely consistent throughout the reporting period. Averaging approx. 0.59mg/L (FCl) and 0.71mg/L (TCl) for the 12 months this is slightly higher than our target of 0.5mg/L but well within our CCP range of 0.2mg/L and 5mg/L. Overall a very good result for the Oura WTP operations.

There were no exceedances for chlorine dosing in the 2021/22 financial year.

Figure 11. Oura fluoride levels for the 2021/22 reporting period



As can be seen in Figure 11, the raw fluoride content from the Oura Bores is very consistent remaining mostly between 0.2mg/L and 0.4mg/L for the reporting period 2021/22. Raw water fluoride averaged 0.17mg/L for the 2021/22 period.

The treated water fluoride was fairly inconsistent over the reporting period recording several exceedances. **All exceedances may be attributed to equipment failure.**

Figure 12. Oura collection tank turbidity levels for the 2021/22 reporting period

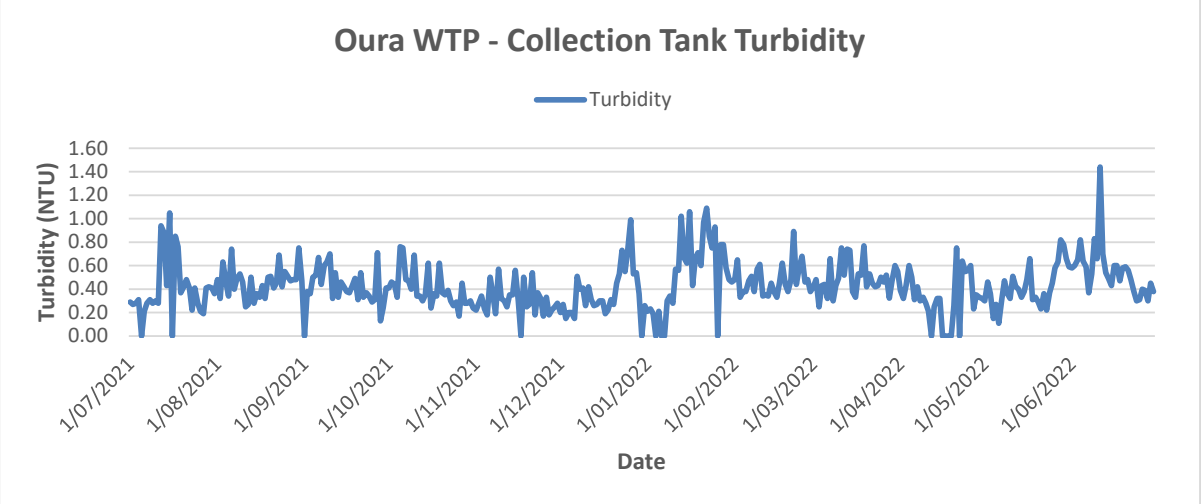


Figure 12 shows the turbidity at the Oura collection tank. Australian Drinking Water Guidelines (ADWG) indicates that turbidity should be <5 NTU (Nephelometric Turbidity Units). As can be seen, there have been no exceedances of this limit for the 2021/22 reporting period.

Figure 13. Oura treated water temperature for the 2021/22 reporting period

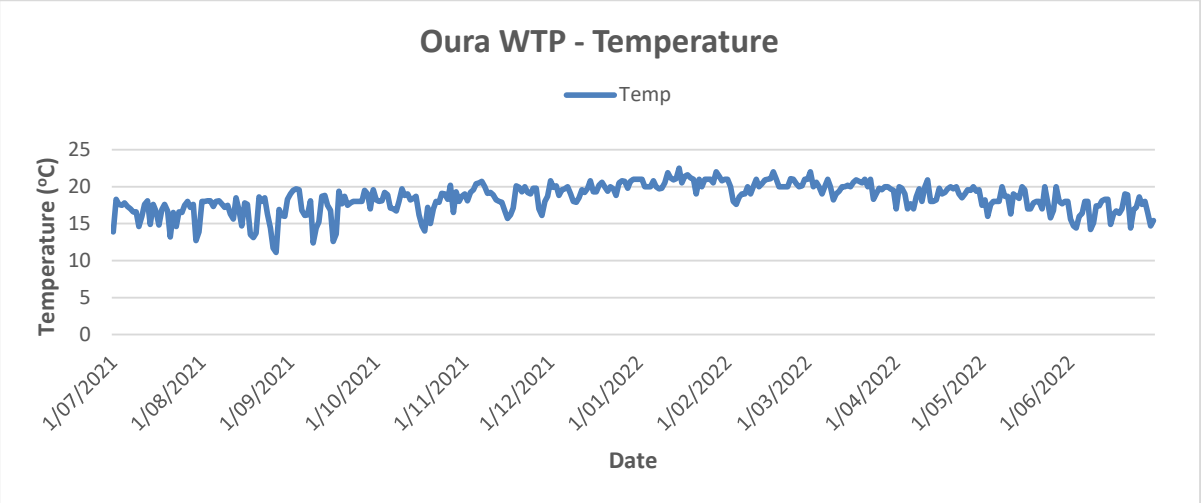


Figure 13 shows the relationship between the temperatures of the treated water with time over the reporting period. As you would surmise, it follows a seasonal trend in that the treated water is warmer in summer and colder in winter.

Water Quality Data Summary

Include a summary of available water quality data over the reporting period here:

- *Raw water*
- *Treated water*
- *Reticulation*
- *Verification*

This data has been generated using the monitoring template spreadsheet, located in the NSW Drinking Water database

Table 22. Raw water measured parameters pertaining to water quality in the 2021/22 reporting period - Jugiong

Parameter	Minimum	Average	Maximum	Lower Critical Limit	Upper Critical Limit	No. Samples
Fluoride	0.1	0.148	0.29			365
Turbidity - Online	4.09	18.51	398			365
Turbidity Offline	5	20.46	572			365
Colour	5	105.8	510			365
pH	6.24	7.58	7.99			365
Temperature	9	16.6	26			365

Table 23. Raw water measured parameters pertaining to water quality in the 2021/22 reporting period - Oura

Parameter	Minimum	Average	Maximum	Lower Critical Limit	Upper Critical Limit	No. Samples
Fluoride	0.17	0.27	0.38			365
pH	6.23	6.98	7.88			365
Temperature	11.1	18.44	22.5			365
Turbidity	0.11	0.34	1.04			365

Table 24. Treated water measured parameters pertaining to water quality in the 2020/21 reporting period - Jugiong

Parameter	Minimum	Average	Maximum	Lower Critical Limit	Upper Critical Limit	No. Samples
Turbidity Online	0.01	0.065	1.32			365
Turbidity – Offline	0.038	0.19	0.57		1	365
Colour	0	3.4	27			365
pH	7.08	7.45	8.1	7	8	365
Temperature	9	16.4	26			365
Alkalinity	40	71.5	160			365
Hardness	0	62.8	170			365
Free Chlorine – Online	0.91	1.6	2.38	0.8	5	366
Total chlorine – Online	1.19	2	2.82			365

Fluoride	0.05	0.98	1.2	0.9	1.5	365

Table 25. Treated water measured parameters pertaining to water quality in the 2021/22 reporting period - Oura

Parameter	Minimum	Average	Maximum	Lower critical limit	Upper critical limit	No. samples
Fluoride	0.23	0.97	1.14	0.9	1.5	365
pH	6.2	7.44	7.84			365
Free Chlorine	0.2	0.59	1.15	0.2	5	365
Total Chlorine	0.3	0.71	1.2			365
Temperature	11.1	18.44	22.5			365

Reticulation Water Quality Reporting

Table 26. Water quality parameters in Jugiong reticulation - Chemistry

Characteristic	Guideline Value	Min	Mean	Max	Sample Count	% meeting guideline values
Aluminium	0.2000	0.02	0.0250	0.03	2	100.00
Antimony	0.0030	0.00005	0.0001	0.00005	2	100.00
Arsenic	0.0100	0.0005	0.0005	0.0005	2	100.00
Barium	2.0000	0.0178	0.0210	0.0241	2	100.00
Boron	4.0000	0.0081	0.0081	0.0081	2	100.00
Cadmium	0.0020	0.00005	0.0001	0.00005	2	100.00
Calcium	10000.0000	11.7	14.4000	17.1	2	100.00
Chloride	250.0000	21	26.5000	32	2	100.00
Chromium	0.0500	0.0005	0.0005	0.0005	2	100.00
Copper	2.0000	0.003	0.0030	0.003	2	100.00
Fluoride	1.5000	0.87	0.9750	1.08	2	100.00
Fluoride (WU result)	1.5000	1.07	1.0700	1.07	1	100.00
Fluoride Ratio	0.8 - 1.2	0.99	0.9900	0.99	1	100.00
Iodine	0.5000	0.01	0.0100	0.01	2	100.00
Iron	0.3000	0.005	0.0050	0.005	2	100.00
Lead	0.0100	0.0001	0.0001	0.0001	2	100.00
Magnesium	10000.0000	6.94	8.2450	9.55	2	100.00
Manganese	0.5000	0.0155	0.0239	0.0322	2	100.00
Mercury	0.0010	0.0004	0.0004	0.0004	2	100.00
Molybdenum	0.0500	0.0002	0.0002	0.0002	2	100.00
Nickel	0.0200	0.0005	0.0006	0.0006	2	100.00
Nitrate	50.0000	1	1.0000	1	2	100.00
Nitrite	3.0000	0.05	0.0500	0.05	2	100.00
pH	6.5 - 8.5	7.7	7.7500	7.8	2	100.00
Selenium	0.0100	0.0035	0.0035	0.0035	2	100.00
Silver	0.1000	0.0001	0.0001	0.0001	2	100.00
Sodium	180.0000	30	34.5000	39	2	100.00
Sulfate	500.0000	45	45.0000	45	2	100.00
Total Dissolved Solids (TDS)	10000.0000	139	153.5000	168	2	100.00
Total Hardness as CaCO3	10000.0000	57.8	69.9000	82	2	100.00
True Colour	15.0000	2	6.5000	11	2	100.00
Turbidity	5.0000	0.05	0.0750	0.1	2	100.00
Uranium	0.0170	0.0001	0.0001	0.0001	2	100.00
Zinc	3.0000	0.01	0.0100	0.01	2	100.00

Table 27. Water quality parameters in Oura reticulation - Chemistry

Characteristic	Guideline Value	Min	Mean	Max	Sample Count	% meeting guideline values
Aluminium	0.2000	0.005	0.0050	0.005	12	100.00
Antimony	0.0030	0.00005	0.0001	0.00005	12	100.00
Arsenic	0.0100	0.001	0.0010	0.001	12	100.00
Barium	2.0000	0.0121	0.0187	0.0243	12	100.00
Boron	4.0000	0.0061	0.0163	0.0194	12	100.00
Cadmium	0.0020	0.00005	0.0001	0.00005	12	100.00
Calcium	10000.0000	11.5	15.3917	19	12	100.00
Chloride	250.0000	17	39.5000	62	12	100.00
Chromium	0.0500	0.0005	0.0006	0.001	12	100.00
Copper	2.0000	0.003	0.0198	0.114	12	100.00
Fluoride	1.5000	0.26	0.9592	1.15	12	100.00
Fluoride (WU result)	1.5000	0.29	0.9775	1.11	12	100.00
Fluoride Ratio	0.8 - 1.2	0.93	1.0300	1.13	12	100.00
Iodine	0.5000	0.03	0.0325	0.05	12	100.00
Iron	0.3000	0.02	0.0500	0.12	12	100.00
Lead	0.0100	0.0001	0.0005	0.0017	12	100.00
Magnesium	10000.0000	9.26	11.8942	14.68	12	100.00
Manganese	0.5000	0.0066	0.0395	0.0751	12	100.00
Mercury	0.0010	0.0004	0.0004	0.0004	12	100.00
Molybdenum	0.0500	0.00005	0.0001	0.0002	12	100.00
Nickel	0.0200	0.0002	0.0003	0.001	12	100.00
Nitrate	50.0000	0.5	1.1250	2	12	100.00
Nitrite	3.0000	0.05	0.0500	0.05	12	100.00
pH	6.5 - 8.5	7.6	7.7250	7.9	12	100.00
Selenium	0.0100	0.0035	0.0035	0.0035	12	100.00
Silver	0.1000	0.0001	0.0001	0.0001	12	100.00
Sodium	180.0000	19	30.0000	41	12	100.00
Sulfate	500.0000	4	10.2500	16	12	100.00
Total Dissolved Solids (TDS)	10000.0000	105	151.0833	207	12	100.00
Total Hardness as CaCO3	10000.0000	67.8	87.4167	107.9	12	100.00
True Colour	15.0000	0.5	0.6250	1	12	100.00
Turbidity	5.0000	0.05	0.5833	1.2	12	100.00
Uranium	0.0170	0.0003	0.0004	0.0005	12	100.00
Zinc	3.0000	0.01	0.0367	0.16	12	100.00

Table 28. Water quality parameters in Mt Arthur reticulation - Chemistry

Characteristic	Guideline Value	Min	Mean	Max	Sample Count	% meeting guideline values
Aluminium	0.2000	0.005	0.0050	0.005	2	100.00
Antimony	0.0030	0.00005	0.0001	0.00005	2	100.00
Arsenic	0.0100	0.0005	0.0008	0.001	2	100.00
Barium	2.0000	0.0099	0.0124	0.0148	2	100.00
Boron	4.0000	0.0398	0.0431	0.0464	2	100.00
Cadmium	0.0020	0.00005	0.0001	0.00005	2	100.00
Calcium	10000.0000	11.2	11.9000	12.6	2	100.00
Chloride	250.0000	42	51.0000	60	2	100.00
Chromium	0.0500	0.0005	0.0005	0.0005	2	100.00
Copper	2.0000	0.011	0.0285	0.046	2	100.00
Fluoride	1.5000	0.4	0.5100	0.62	2	100.00
Iodine	0.5000	0.03	0.0400	0.05	2	100.00
Iron	0.3000	0.05	0.1800	0.31	2	50.00
Lead	0.0100	0.0001	0.0002	0.0003	2	100.00
Magnesium	10000.0000	7.27	8.0700	8.87	2	100.00
Manganese	0.5000	0.0061	0.0216	0.037	2	100.00
Mercury	0.0010	0.0004	0.0004	0.0004	2	100.00
Molybdenum	0.0500	0.0002	0.0003	0.0004	2	100.00
Nickel	0.0200	0.0002	0.0002	0.0002	2	100.00
Nitrate	50.0000	0.5	0.5000	0.5	2	100.00
Nitrite	3.0000	0.05	0.0500	0.05	2	100.00
pH	6.5 - 8.5	7.6	7.6000	7.6	2	100.00
Selenium	0.0100	0.0035	0.0035	0.0035	2	100.00
Silver	0.1000	0.0001	0.0001	0.0001	2	100.00
Sodium	180.0000	40	44.0000	48	2	100.00
Sulfate	500.0000	8	9.0000	10	2	100.00
Total Dissolved Solids (TDS)	10000.0000	151	170.5000	190	2	100.00
Total Hardness as CaCO3	10000.0000	57.9	62.9500	68	2	100.00
True Colour	15.0000	0.5	0.7500	1	2	100.00
Turbidity	5.0000	0.1	0.7000	1.3	2	100.00
Uranium	0.0170	0.00005	0.0001	0.00005	2	100.00
Zinc	3.0000	0.01	0.0100	0.01	2	100.00

Table 29. Water quality parameters in the Mt Daylight reticulation- Chemistry

Characteristic	Guideline Value	Min	Mean	Max	Sample Count	% meeting guideline values
Aluminium	0.2000	0.005	0.0050	0.005	2	100.00
Antimony	0.0030	0.00005	0.0001	0.0001	2	100.00
Arsenic	0.0100	0.002	0.0025	0.003	2	100.00
Barium	2.0000	0.078	0.0784	0.0787	2	100.00
Boron	4.0000	0.0386	0.0392	0.0397	2	100.00
Cadmium	0.0020	0.00005	0.0001	0.00005	2	100.00
Calcium	10000.0000	24.5	25.1000	25.7	2	100.00
Chloride	250.0000	103	104.0000	105	2	100.00
Chromium	0.0500	0.0005	0.0005	0.0005	2	100.00
Copper	2.0000	0.009	0.0095	0.01	2	100.00
Fluoride	1.5000	0.56	0.5700	0.58	2	100.00
Iodine	0.5000	0.14	0.1450	0.15	2	100.00
Iron	0.3000	0.005	0.0075	0.01	2	100.00
Lead	0.0100	0.0003	0.0004	0.0004	2	100.00
Magnesium	10000.0000	19.06	20.1450	21.23	2	100.00
Manganese	0.5000	0.0009	0.0010	0.001	2	100.00
Mercury	0.0010	0.0004	0.0004	0.0004	2	100.00
Molybdenum	0.0500	0.0024	0.0025	0.0026	2	100.00
Nickel	0.0200	0.0005	0.0006	0.0006	2	100.00
Nitrate	50.0000	0.5	0.5000	0.5	2	100.00
Nitrite	3.0000	0.05	0.0500	0.05	2	100.00
pH	6.5 - 8.5	7.5	7.6500	7.8	2	100.00
Selenium	0.0100	0.0035	0.0035	0.0035	2	100.00
Silver	0.1000	0.0001	0.0001	0.0001	2	100.00
Sodium	180.0000	82	83.5000	85	2	100.00
Sulfate	500.0000	39	40.5000	42	2	100.00
Total Dissolved Solids (TDS)	10000.0000	328	344.5000	361	2	100.00
Total Hardness as CaCO3	10000.0000	142.7	145.6500	148.6	2	100.00
True Colour	15.0000	0.5	0.5000	0.5	2	100.00
Turbidity	5.0000	0.3	0.9000	1.5	2	100.00
Uranium	0.0170	0.0032	0.0035	0.0037	2	100.00
Zinc	3.0000	0.02	0.0750	0.13	2	100.00

Goldenfields Water

Drinking Water Management System

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Table 30. Microbiological results - Jugiong

Characteristic	Guideline Value	Units	Mean	Median	Standard Deviation	Min	Max	Sample Count	Exception Count	95th Percentile	5th Percentile	% meeting guideline values
E. coli	0.0000	mpn/100 mL	0.0759	0.0000	0.5006	0	4	79	2	0	0	97.47
Free Chlorine	0.2 - 5	mg/L	0.3396	0.1750	0.4689	0.02	2.21	78	42	1.62	0.02	46.15
pH	6.5 - 8.5		8.0315	8.0250	0.3823	7.25	8.92	72	7	8.65	7.35	90.28
Temperature	30.0000	C	17.6577	18.1500	4.6525	9.6	25.4	78	0	24	10.2	100.00
Total Chlorine	5.0000	mg/L	0.5701	0.4200	0.5363	0.05	2.28	78	0	1.8	0.05	100.00
Total Coliforms	0.0000	mpn/100 mL	3.1519	0.0000	22.7861	0	201	79	4	9	0	94.94
Turbidity	5.0000	NTU	0.5531	0.4650	0.3746	0.12	2.34	78	0	1.25	0.23	100.00

Table 31. Microbiological results - Oura

Characteristic	Guideline Value	Units	Mean	Median	Standard Deviation	Min	Max	Sample Count	Exception Count	95th Percentile	5th Percentile	% meeting guideline values
E. coli	0.0000	mpn/100 mL	0.0000	0.0000	0.0000	0	0	278	0	0	0	100.00
Free Chlorine	0.2 - 5	mg/L	0.4908	0.4450	0.2642	0.02	1.39	278	25	1.03	0.12	91.01
pH	6.5 - 8.5		8.4020	8.4100	0.3976	7.2	9.41	252	106	9.05	7.72	57.94
Temperature	30.0000	C	18.9383	18.5000	5.6721	7.7	33	277	3	28	10.7	98.92
Total Chlorine	5.0000	mg/L	0.6417	0.6000	0.3143	0.04	3	278	0	1.2	0.24	100.00
Total Coliforms	0.0000	mpn/100 mL	0.0180	0.0000	0.1579	0	2	278	4	0	0	98.56
Turbidity	5.0000	NTU	0.5816	0.4800	0.4363	0.07	3.7	278	0	1.31	0.18	100.00

Table 32. Microbiological results – Mt Arthur

Characteristic	Guideline Value	Units	Mean	Median	Standard Deviation	Min	Max	Sample Count	Exception Count	95th Percentile	5th Percentile	% meeting guideline values
E. coli	0.0000	mpn/100 mL	0.0000	0.0000	0.0000	0	0	49	0	0	0	100.00
Free Chlorine	0.2 - 5	mg/L	0.4337	0.4400	0.2727	0.02	1.08	49	11	0.82	0.02	77.55
pH	6.5 - 8.5		7.9909	7.8700	0.4956	7.34	9.57	44	3	9.33	7.47	93.18
Temperature	30.0000	C	18.5286	17.5000	5.1262	11.3	29	49	0	28.2	12.2	100.00
Total Chlorine	5.0000	mg/L	0.5598	0.6000	0.2821	0.04	1.25	49	0	0.9	0.07	100.00
Total Coliforms	0.0000	mpn/100 mL	0.3878	0.0000	2.3168	0	16	49	2	0	0	95.92
Turbidity	5.0000	NTU	0.5871	0.4800	0.3661	0.19	2.4	49	0	1.06	0.24	100.00

Table 33. Microbiological results – Mt Daylight - Micros

Characteristic	Guideline Value	Units	Mean	Median	Standard Deviation	Min	Max	Sample Count	Exception Count	95th Percentile	5th Percentile	% meeting guideline values
E. coli	0.0000	mpn/100 mL	0.0000	0.0000	0.0000	0	0	31	0	0	0	100.00
Free Chlorine	0.2 - 5	mg/L	0.2987	0.2700	0.2031	0.02	0.75	31	12	0.7	0.02	61.29
pH	6.5 - 8.5		7.6374	7.6000	0.2597	7.08	8.12	31	0	8.05	7.26	100.00
Temperature	30.0000	C	20.7194	22.2000	5.2721	12.2	29.3	31	0	27.3	12.2	100.00
Total Chlorine	5.0000	mg/L	0.4681	0.4600	0.2021	0.12	0.92	31	0	0.76	0.12	100.00
Total Coliforms	0.0000	mpn/100 mL	0.0000	0.0000	0.0000	0	0	31	0	0	0	100.00
Turbidity	5.0000	NTU	0.5539	0.4200	0.4854	0.08	2.8	31	0	1.22	0.15	100.00

Verification Monitoring – Jugiong

Table 34. Summary of NSW Health's drinking water monitoring program data for the Jugiong scheme

Analysis Type	Characteristic	Guideline Value	Min	Mean	Max	Sample Count	% meeting guideline values
Chemistry	Aluminium	0.2000	0.02	0.0250	0.03	2	100.00
	Antimony	0.0030	0.00005	0.0001	0.00005	2	100.00
	Arsenic	0.0100	0.0005	0.0005	0.0005	2	100.00
	Barium	2.0000	0.0178	0.0210	0.0241	2	100.00
	Boron	4.0000	0.0081	0.0081	0.0081	2	100.00
	Cadmium	0.0020	0.00005	0.0001	0.00005	2	100.00
	Calcium	10000.0000	11.7	14.4000	17.1	2	100.00
	Chloride	250.0000	21	26.5000	32	2	100.00
	Chromium	0.0500	0.0005	0.0005	0.0005	2	100.00
	Copper	2.0000	0.003	0.0030	0.003	2	100.00
	Fluoride	1.5000	0.87	0.9750	1.08	2	100.00
	Fluoride (WU result)	1.5000	1.07	1.0700	1.07	1	100.00
	Fluoride Ratio	0.8 - 1.2	0.99	0.9900	0.99	1	100.00
	Iodine	0.5000	0.01	0.0100	0.01	2	100.00
	Iron	0.3000	0.005	0.0050	0.005	2	100.00
	Lead	0.0100	0.0001	0.0001	0.0001	2	100.00
	Magnesium	10000.0000	6.94	8.2450	9.55	2	100.00
	Manganese	0.5000	0.0155	0.0239	0.0322	2	100.00
	Mercury	0.0010	0.0004	0.0004	0.0004	2	100.00
	Molybdenum	0.0500	0.0002	0.0002	0.0002	2	100.00
	Nickel	0.0200	0.0005	0.0006	0.0006	2	100.00
	Nitrate	50.0000	1	1.0000	1	2	100.00
	Nitrite	3.0000	0.05	0.0500	0.05	2	100.00
	pH	6.5 - 8.5	7.7	7.7500	7.8	2	100.00
	Selenium	0.0100	0.0035	0.0035	0.0035	2	100.00
	Silver	0.1000	0.0001	0.0001	0.0001	2	100.00
	Sodium	180.0000	30	34.5000	39	2	100.00
	Sulfate	500.0000	45	45.0000	45	2	100.00
	Total Dissolved Solids (TDS)	10000.0000	139	153.5000	168	2	100.00
	Total Hardness as CaCO3	10000.0000	57.8	69.9000	82	2	100.00
	True Colour	15.0000	2	6.5000	11	2	100.00
	Turbidity	5.0000	0.05	0.0750	0.1	2	100.00
	Uranium	0.0170	0.0001	0.0001	0.0001	2	100.00
	Zinc	3.0000	0.01	0.0100	0.01	2	100.00

Fluoride Barcode	Fluoride	1.5000	0.79	0.9108	1.03	12	100.00
	Fluoride (WU result)	1.5000	0.86	0.9767	1.07	12	100.00
	Fluoride Ratio	0.8 - 1.2	0.92	1.0742	1.15	12	100.00
Microbiology	E. coli	0.0000	0	0.0759	4	79	97.47
	Free Chlorine	0.2 - 5	0.02	0.3396	2.21	78	46.15
	pH	6.5 - 8.5	7.25	8.0315	8.92	72	90.28
	Temperature	30.0000	9.6	17.6577	25.4	78	100.00
	Total Chlorine	5.0000	0.05	0.5701	2.28	78	100.00
	Total Coliforms	0.0000	0	3.1519	201	79	94.94
	Turbidity	5.0000	0.12	0.5531	2.34	78	100.00

Table 35. Summary of NSW Health's drinking water monitoring program data for the Oura scheme.

Analysis Type	Characteristic	Guideline Value	Min	Mean	Max	Sample Count	% meeting guideline values
Chemistry	Aluminium	0.2000	0.005	0.0050	0.005	12	100.00
	Antimony	0.0030	0.00005	0.0001	0.00005	12	100.00
	Arsenic	0.0100	0.001	0.0010	0.001	12	100.00
	Barium	2.0000	0.0121	0.0187	0.0243	12	100.00
	Boron	4.0000	0.0061	0.0163	0.0194	12	100.00
	Cadmium	0.0020	0.00005	0.0001	0.00005	12	100.00
	Calcium	10000.0000	11.5	15.3917	19	12	100.00
	Chloride	250.0000	17	39.5000	62	12	100.00
	Chromium	0.0500	0.0005	0.0006	0.001	12	100.00
	Copper	2.0000	0.003	0.0198	0.114	12	100.00
	Fluoride	1.5000	0.26	0.9592	1.15	12	100.00
	Fluoride (WU result)	1.5000	0.29	0.9775	1.11	12	100.00
	Fluoride Ratio	0.8 - 1.2	0.93	1.0300	1.13	12	100.00
	Iodine	0.5000	0.03	0.0325	0.05	12	100.00
	Iron	0.3000	0.02	0.0500	0.12	12	100.00
	Lead	0.0100	0.0001	0.0005	0.0017	12	100.00
	Magnesium	10000.0000	9.26	11.8942	14.68	12	100.00
	Manganese	0.5000	0.0066	0.0395	0.0751	12	100.00
	Mercury	0.0010	0.0004	0.0004	0.0004	12	100.00
	Molybdenum	0.0500	0.00005	0.0001	0.0002	12	100.00
	Nickel	0.0200	0.0002	0.0003	0.001	12	100.00
	Nitrate	50.0000	0.5	1.1250	2	12	100.00
	Nitrite	3.0000	0.05	0.0500	0.05	12	100.00
	pH	6.5 - 8.5	7.6	7.7250	7.9	12	100.00
	Selenium	0.0100	0.0035	0.0035	0.0035	12	100.00
	Silver	0.1000	0.0001	0.0001	0.0001	12	100.00

	Sodium	180.0000	19	30.0000	41	12	100.00
	Sulfate	500.0000	4	10.2500	16	12	100.00
	Total Dissolved Solids (TDS)	10000.0000	105	151.0833	207	12	100.00
	Total Hardness as CaCO3	10000.0000	67.8	87.4167	107.9	12	100.00
	True Colour	15.0000	0.5	0.6250	1	12	100.00
	Turbidity	5.0000	0.05	0.5833	1.2	12	100.00
	Uranium	0.0170	0.0003	0.0004	0.0005	12	100.00
	Zinc	3.0000	0.01	0.0367	0.16	12	100.00
Microbiology	E. coli	0.0000	0	0.0000	0	278	100.00
	Free Chlorine	0.2 - 5	0.02	0.4908	1.39	278	91.01
	pH	6.5 - 8.5	7.2	8.4020	9.41	252	57.94
	Temperature	30.0000	7.7	18.9383	33	277	98.92
	Total Chlorine	5.0000	0.04	0.6417	3	278	100.00
	Total Coliforms	0.0000	0	0.0180	2	278	98.56
	Turbidity	5.0000	0.07	0.5816	3.7	278	100.00

Table 36. Summary of NSW Health's drinking water monitoring program data for the Mt Arthur scheme

Analysis Type	Characteristic	Guideline Value	Min	Mean	Max	Sample Count	% meeting guideline values
Chemistry							
	Aluminium	0.2000	0.005	0.0072	0.03	18	100.00
	Antimony	0.0030	0.00005	0.0001	0.0001	18	100.00
	Arsenic	0.0100	0.0005	0.0011	0.003	18	100.00
	Barium	2.0000	0.0099	0.0249	0.0787	18	100.00
	Boron	4.0000	0.0061	0.0209	0.0464	18	100.00
	Cadmium	0.0020	0.00005	0.0001	0.00005	18	100.00
	Calcium	10000.0000	11.2	15.9722	25.7	18	100.00
	Chloride	250.0000	17	46.5000	105	18	100.00
	Chromium	0.0500	0.0005	0.0006	0.001	18	100.00
	Copper	2.0000	0.003	0.0178	0.114	18	100.00
	Fluoride	1.5000	0.26	0.8678	1.15	18	100.00
	Fluoride (WU result)	1.5000	0.29	0.9846	1.11	13	100.00
	Fluoride Ratio	0.8 - 1.2	0.93	1.0269	1.13	13	100.00
	Iodine	0.5000	0.01	0.0433	0.15	18	100.00
	Iron	0.3000	0.005	0.0547	0.31	18	94.44
	Lead	0.0100	0.0001	0.0004	0.0017	18	100.00
	Magnesium	10000.0000	6.94	11.9806	21.23	18	100.00

	Manganese	0.5000	0.0009	0.0315	0.0751	18	100.00
	Mercury	0.0010	0.0004	0.0004	0.0004	18	100.00
	Molybdenum	0.0500	0.00005	0.0004	0.0026	18	100.00
	Nickel	0.0200	0.0002	0.0004	0.001	18	100.00
	Nitrate	50.0000	0.5	0.9722	2	18	100.00
	Nitrite	3.0000	0.05	0.0500	0.05	18	100.00
	pH	6.5 - 8.5	7.5	7.7056	7.9	18	100.00
	Selenium	0.0100	0.0035	0.0035	0.0035	18	100.00
	Silver	0.1000	0.0001	0.0001	0.0001	18	100.00
	Sodium	180.0000	19	38.0000	85	18	100.00
	Sulfate	500.0000	4	17.3333	45	18	100.00
	Total Dissolved Solids (TDS)	10000.0000	105	175.0000	361	18	100.00
	Total Hardness as CaCO3	10000.0000	57.8	89.2222	148.6	18	100.00
	True Colour	15.0000	0.5	1.2778	11	18	100.00
	Turbidity	5.0000	0.05	0.5750	1.5	18	100.00
	Uranium	0.0170	0.00005	0.0007	0.0037	18	100.00
	Zinc	3.0000	0.01	0.0350	0.16	18	100.00
Fluoride Barcode							
	Fluoride	1.5000	0.79	0.9108	1.03	12	100.00
	Fluoride (WU result)	1.5000	0.86	0.9767	1.07	12	100.00
	Fluoride Ratio	0.8 - 1.2	0.92	1.0742	1.15	12	100.00
Microbiology							
	E. coli	0.0000	0	0.0137	4	437	99.54
	Free Chlorine	0.2 - 5	0.02	0.4437	2.21	436	79.36
	pH	6.5 - 8.5	7.08	8.2304	9.57	399	70.93
	Temperature	30.0000	7.7	18.7894	33	435	99.31
	Total Chlorine	5.0000	0.04	0.6073	3	436	100.00
	Total Coliforms	0.0000	0	0.6247	201	437	97.71
	Turbidity	5.0000	0.07	0.5752	3.7	436	100.00
Operational Monitoring							
	Fluoride (weekly WU)	0.9 - 1.5	0.8	0.9781	1.11	171	94.74

Table 37. Summary of NSW Health's drinking water monitoring program data for the Mt Daylight scheme

Analysis type	Characteristic	Guideline Value	Min	Mean	Max	Sample Count	% meeting guideline values
Chemistry	Aluminium	0.2000	0.005	0.0050	0.005	2	100.00
	Antimony	0.0030	0.00005	0.0001	0.0001	2	100.00
	Arsenic	0.0100	0.002	0.0025	0.003	2	100.00
	Barium	2.0000	0.078	0.0784	0.0787	2	100.00
	Boron	4.0000	0.0386	0.0392	0.0397	2	100.00
	Cadmium	0.0020	0.00005	0.0001	0.00005	2	100.00
	Calcium	10000.0000	24.5	25.1000	25.7	2	100.00
	Chloride	250.0000	103	104.0000	105	2	100.00
	Chromium	0.0500	0.0005	0.0005	0.0005	2	100.00
	Copper	2.0000	0.009	0.0095	0.01	2	100.00
	Fluoride	1.5000	0.56	0.5700	0.58	2	100.00
	Iodine	0.5000	0.14	0.1450	0.15	2	100.00
	Iron	0.3000	0.005	0.0075	0.01	2	100.00
	Lead	0.0100	0.0003	0.0004	0.0004	2	100.00
	Magnesium	10000.0000	19.06	20.1450	21.23	2	100.00
	Manganese	0.5000	0.0009	0.0010	0.001	2	100.00
	Mercury	0.0010	0.0004	0.0004	0.0004	2	100.00
	Molybdenum	0.0500	0.0024	0.0025	0.0026	2	100.00
	Nickel	0.0200	0.0005	0.0006	0.0006	2	100.00
	Nitrate	50.0000	0.5	0.5000	0.5	2	100.00
	Nitrite	3.0000	0.05	0.0500	0.05	2	100.00
	pH	6.5 - 8.5	7.5	7.6500	7.8	2	100.00
	Selenium	0.0100	0.0035	0.0035	0.0035	2	100.00
	Silver	0.1000	0.0001	0.0001	0.0001	2	100.00
	Sodium	180.0000	82	83.5000	85	2	100.00
	Sulfate	500.0000	39	40.5000	42	2	100.00
	Total Dissolved Solids (TDS)	10000.0000	328	344.5000	361	2	100.00
	Total Hardness as CaCO3	10000.0000	142.7	145.6500	148.6	2	100.00
	True Colour	15.0000	0.5	0.5000	0.5	2	100.00
	Turbidity	5.0000	0.3	0.9000	1.5	2	100.00
	Uranium	0.0170	0.0032	0.0035	0.0037	2	100.00
	Zinc	3.0000	0.02	0.0750	0.13	2	100.00
Microbiology	E. coli	0.0000	0	0.0000	0	31	100.00
	Free Chlorine	0.2 - 5	0.02	0.2987	0.75	31	61.29
	pH	6.5 - 8.5	7.08	7.6374	8.12	31	100.00

	Temperature	30.0000	12.2	20.7194	29.3	31	100.00
	Total Chlorine	5.0000	0.12	0.4681	0.92	31	100.00
	Total Coliforms	0.0000	0	0.0000	0	31	100.00
	Turbidity	5.0000	0.08	0.5539	2.8	31	100.00

Appendix B - Continuous Improvement Plan

GWCCC DWMS Action and Improvement Plan

Table 38. GWCC DWMS Action and Improvement Plan

No.	Action	Type	Status	Date completed/ closed	Comments	Priority	Responsibility	Action reference
1	GWCC to consider installing an online free chlorine analyser at Oura disinfection point (after 30 min contact time).	Capital works	Complete		25/11/2016 - 9 analysers purchased. As Oura is not disinfecting for primary kill, the analyser should be located as close as practical to the disinfection point. 15/10/2019 - Blueeye analyser installed; however has been found to be unreliable. Analyser has not be implemented for control however is registering trends. A new Burket system will now be installed as a replacement. 1/9/2021 - Burkert Analyser has been installed and operating since early 2020	Very High	Manger Production and Services	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

2	GWCC to consider training staff in backflow prevention	Training	Complete	Sep-16				GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
3	GWCC to consider conducting internal training on chlorine residual testing	Training	Complete	2017				GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
4	GWCC to conduct internal training (or refresher training) on correct sampling techniques	Training	Complete	2017	25/11/2016 - Register needs to be updated to capture internal training completed 15/10/2019 - All Water Qual staff have been inducted into proper sampling techniques; however a role out of all staff across the organisation whom may require sampling as part of their role will need to be undertaken. 25/8/2020 All new distribution staff inducted internally however; a register is yet to be developed. 1/9/2021 - all compliance sampling is conducted by Water Quality Staff now who are trained and specialised. The only	Low		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

					testing that occurs from distribution staff is now just chlorine operational samples. Water Quality Staff continue development and all maintain their cert 3 in water treatment plant operations.		
5	GWCC to consider conducting a community education program on backflow prevention	Community engagement	Closed	25-Nov	25/11/2016 - Action closed due to changed process. Refer to action 33 (implement backflow prevention program)		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
6	GWCC to conduct bacto sampling after storm event if visual check of bores show signs of being compromised	Monitoring	Closed	25-Nov	25/11/2016 - Action closed due to changed process. Refer to action 33 (implement backflow prevention program)		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

7	GWCC to install an online turbidity meter in Murrumbidgee River to predict water quality decline	Capital works	Closed	Nov-16	25/11/2016 - Turbidity meter purchased. However this action is no longer required. Controls for WTP are established at the plant through the upgrade to ClearScada control system. Raw water turbiditity is already measured and shuts the plant down if variation >20% occurs. Contact with WaterNSW will also provide any release changes that may impact on river turbidity.		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
8	GWCC to roll out system of different levels of key access to increase security	Operations and maintenance	Complete	2016	25/11/2016 - Keys purchased 25/8/2020, majority of all sites now completed with only remote site remaining		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
9	GWCC to consider performing preventative maintenance on solenoid valves leading into fluoride batching tank	Operations and maintenance	Closed	Nov	25/11/2016 - Considered as part of maintenance		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

10	GWCC to check data entry to ensure no errors and record all incidents and causes of high readings (e.g. data entry error, human error, etc.)	Monitoring	Closed	2017	the implementation of a new water quality database (Wateroutlook) has allowed for the centralisation of all test results and automated reporting for any non-conformances.	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
11	GWCC to consider purchasing electronic chlorine analyser to eliminate manganese interference with chlorine residual testing as per DPI Water recommendation (e.g. chloro-sense kits)	Capital works	Closed	2014	25/11/2016 - One at Jugiong and one at Oura	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
12	GWCC to consider increasing monitoring of chlorine residual throughout system during power outages	Monitoring	Closed	25-Nov	25/11/2016 - Covered within incident management. 9 chlorine analysers to be installed 15/10/2019 - multiple sites now online via SCADA with battery backup operations.	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

13	GWCC to consider installing online chlorine analysers at Oura PS	Capital works	Closed	25/11/2016 - analyser purchased. Currently being installed and connected to SCADA 2017. 15/10/2019 - Analyser installed in lab. Reliability of the Blueeye unit is not good and a new unit will be installed in 2019. System is currently operating however no controls have been engaged from the analyser due to reliability f the unit. Trends are however being obtained. 1/9/2021 works were complete and commissioned in early 2020		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

14	GWCC to develop a register for water carters	Procedures and documentation	Closed		2017 - Letters issued to all known water carters within supply area. No responses received from water caters regarding potable water services. Process will be controlled greater via the installation of automated filling stations which will be delivered as an ongoing capital delivery project. 15/10/2019 - Filling stations installed at Temora, Bardmedman and West Wyalong. No commercial water carters for potable services have been registered.			GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
15	GWCC to develop and maintain a register of RPZs within distribution system	Procedures and documentation	Closed		To be completed as part of *Action33 Implement backflow prevention program*			GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
16	GWCC to consider and investigate and install the most suitable BFPD on the connection between Oura	Capital works	Complete		2017 risk assesment and report developed on the non-pot system and its potential for cross contamination. Further projects to progress to investigation stage in	High	Manager Engineering	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

	and Hylands Bridge (e.g. RPZ, break tank with air gap, etc.)			2018. 15/10/2019 - Works still outstanding 25/8/2020 Works still outstanding 1/1/2022 A stop valve and non-return valve has been put in place to reduce any risk of backflow		
17	GWCC to ensure all hatches on reservoirs comply with AS/NZS	Operations and maintenance	Rolled into other action	To be completed as part of *Action 36 To complete and submit circular 18*		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
18	GWCC to implement a formal water quality monitoring regime at Mt Arthur to monitor pH, turbidity, free, and total chlorine	Monitoring	Rolled into other action	To be completed as part of *Action 37 Complete formal review of monitoring plan, against ADWG, NSW Health*		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
19	GWCC to implement a formal water quality monitoring regime at Mt Daylight to monitor pH, turbidity, free,	Monitoring	Rolled into other action	To be completed as part of *Action 37 Complete formal review of monitoring plan, against ADWG, NSW Health*		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

	and total chlorine				
20	GWCC to install a backflow prevention device between the GWCC reservoir and the reservoir managed by Carathool Shire Council to protect water quality in the Mt Daylight drinking water supply	Capital works	Closed	25/11/2016 - Part of broader discussion on governance with Carathool Shire Council 25/8/2020 there is an airgap between water in reservoir and inlet therefore restricting any backflow	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
21	GWCC to consider purging reservoir as part of emergency response if contamination is suspected	Operations and maintenance	Closed	25/11/2016 - Considered as part of emergency procedures	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
22	GWCC to consider alarming all reservoir hatch doors in case of sabotage or vandalism. Mt Daylight reservoir is a	Operations and maintenance	Closed	25/11/2016 - Been considered, but currently not practical. Managed with weekly and quarterly inspections.	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

	priority, which is the most remote							
23	GWCC to complete live chlorine monitoring system for reticulation system (in progress)	Capital works	Complete		25/11/2016 - analyser purchased 15/10/2019 - analysers will be installed on demarcation boundaries for Bulk customers retics. No considerations for online retic monitoring is being considered at this stage as water quality team are building data to inform future decisions such as apporpriate locailities that warrant online monitoring. 25/8/2020 as per previous note on 15/10/2019 - 1/9/2021 as per previous advice and note that staff undertake significant amount of additional operational testing for the retic systems.	Low	Manager Production & Services	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

24	GWCC to consider developing SOP for fluoride hopper cleaning	Procedures and documentation	Complete		15/10/2019 - External training consultant required to facilitate, training and development of an SOP for Trades. This will occur upon completion of the new Code of Practice. 25/8/2020 SOP has been drafted and induction to be provided for all trades and WTP operators - 1/9/2021 new induction procedure was completed and implemented in 2020	Very High	Manager Production & Services	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
25	GWCC to consider developing SOPs for chlorine testing to include manganese interference with reagent	Procedures and documentation	Closed	30/06/2019	15/10/2019 - consideration of developing SOP's has been determined as not required.			GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
26	GWCC to develop SOPs for operational and supporting activities, such as plant operation, mains break repair,	Procedures and documentation	Complete		15/10/2019 - SOPS for WTP's and Water Quality division have been completed. Distribution SOP's now required in line with relevant training 25/8/2020 distribution staff to develop SOPS for	Medium	Manager Operations	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

	mains flushing, etc.				their activities e.g. mains breaks - 1/9/2021 GWCC have now established a WHS committee and officers, continual improvement processes are in place and managed as part of this process. This includes all WHS documentation and SOP needs for the organisation			
27	GWCC to include drinking water quality management in the annual report, as recommended in Element 10 of the ADWG	Procedures and documentation	Complete	2018	First report and submitted in October 2018.			GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
28	Educate community member that owns the private bore in close proximity to Oura Borefield to ensure they are aware that the bore accesses the drinking water aquifer	Community engagement	Complete	30/06/2020	25/11/2016 - Refer to new action 38	High	Manager Engineering	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

29	GWCC to consider installing online chlorine residual analyser at outlet of settling tanks to ensure 30 minutes contact time (Mt Arthur system)	Capital works	In progress		25/11/2016 - Analyser purchased. Unit has been installed at Ganmain; however just waiting on connection for discharge water to sewer before commissioning occurs. 15/10/2019 - Analysers and Maglows to be installed in the Mt Arthur System to provide more data for potential treatment requirements. Investigations to Occur from January 2020 as part of MIPPS student placement. -25/8/2020 MIPPS student investigation project complete June 2020, further investigations in treatment options to occur - 1/9/2021 magflow and analysers installed however not connected to clearscada system. - 1/11/2022 Mt Arthur SCADA/Telemetry network to commence upgrade in 2022/23 financial year.	Low	Manager Production & Services	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

					Connection of water quality instrumentation to be completed after this.			
30	GWCC to consider changing location of online chlorine analyser in the Mt Daylight system to ensure free chlorine measurement after 30 min contact time. Both the chlorine dosing and the chlorine analyser are located at the reservoir inlet	Capital works	Closed	30/06/2020	Consider as part of analyser installation. 15/10/2019 - Analyser installed at Naradhan Res's providing residual levels 15km down stream of dosing point. Anlayser needs to include controls to inhibit Daylight pumps if residuals or CL2 dosing stops.	Medium	Manager Production & Services	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

31	Determine the level of water quality training required for new staff and add to induction program	Training	Complete	15/10/2019 - Consideration of training will need to be developed in accordance with each individuals role. However in terms of induction and competancy based requirements for all field staff, this needs to be developed. 25/8/2020 all new starter within WQ and distribution teams have been provided relevent inductions where required however formal register yet to be developed. - 1/9/2021 water quality staff now managing all compliance requirements of the DWMS. Their training is being developed in line with the National Training Package 2020. We are working with the NSW Water Directorate and TWRRP Team for access to new training providers which has delayed our continual development	Medium	Human Resource Coordinator	Added as part of action and improvement plan review (25 November 2016)

				requirements. Staff undertake a review of their Staff Development Plans every 6 months			
32	Develop and implement competency checklist/schedule on sampling methodology	Training	Closed	30/06/2020	15/10/2019 - Will be considered as part of an induction and training program for water quality testing. Internally competency sign off required 25/8/2020 has been considered and will form part of induction process and register - 1/9/2021 All compliance sampling conducted by Quality staff now whom hold a minimum of cert 3 in water treatment operations.	Low	Manager Production & Services	Added as part of action and improvement plan review (25 November 2016)

33	Implement backflow prevention program, including developing register of RPZs	Capital works	Closed	30/06/2020	25/11/2016 - Budget approved, project underway. 15/10/2019 - Program has commenced and is nearing its completion for all rural high risk connections.25/8/2020 RPZD register of high risk connections has been completed	Very High	Manager Engineering	Added as part of action and improvement plan review (25 November 2016)
34	Develop a microbiological sampling SOP when bore head integrity has been potentially compromised (maintenance, flooding, vandalism)	Procedures and documentation	Closed	30/06/2019	15/10/2019 - in line with action item 6 above. Emergancy Response SOP's have been developed. Routine raw water testing now undertaken.			Added as part of action and improvement plan review (25 November 2016)
35	Investigate options for electronic card systems on standpipes to record water carter access	Capital works	Closed	30/06/2019	Temora and West Wyalong have been determined as priority locations for installation during the 18/19 financial year. 15/10/2019 - West Wyalong, Temora and Barmedman now installed and operational.			Added as part of action and improvement plan review (25 November 2016)

36	To complete and submit circular 18	Operations and maintenance	Complete		The development of routine inspections and standard operating procedures have been completed in 2017. Work on the development of a centralised database that can issue out work orders and retain asset corrective action data is now being developed through Wateroutlook. 15/10/2019 - formal submission Circular 18 has not recieved any feedback from 2017. Consideration of new submission to be made. 25/8/2020 No change still no feedback from DPIE	High	Manager Engineering	Added as part of action and improvement plan review (25 November 2016)
37	Complete formal review of monitoring plan, against ADWG, NSW Health	Monitoring	Complete	2017	Works completed with independent review completed by Atom consulting in 2017. 15/10/2019 - Annual DWMS review is undertaken in October of every year and reported to NSW Health upon completion.			Added as part of action and improvement plan review (25 November 2016)

38	Investigate bore 5 private ownership and licensing, in liaison with DPI Water. Considering water quality contamination risks from bore	Investigative studies	Closed	30/06/2019	15/10/2019 - contact with Land Holder and DOI Water to occur 25/8/2020 no indication of active bore, GWCC to continue to monitor raw water of existing borefield	High	Manager Engineering	Added as part of action and improvement plan review (25 November 2016)
39	Ensure bore 1 wellhead security e.g. secure gaps in casement	Capital works	Closed	2019	contact with land holder to gain access and investigate bore closure to occur in 2018 15/10/2019 - 100% confirmation is not possible. Continued monitoring of our borefield raw water will identify any issues if such shall arise.			Added as part of action and improvement plan review (25 November 2016)
40	Review operational monitoring data	Monitoring	Complete	ongoing	Independent monitoring report completed by Atom Consulting with internal review also undertaken for development of better operational data gathering for population of Wateroutlook system.			Added as part of action and improvement plan review (25 November 2016)
41	Formulate a Drinking Water Quality Policy	Procedures and documentation	Closed	2018	Formulate a drinking Water Policy, to be completed before August council meeting.		Manger Production and Services	Added as part of review/development of DWMS

					15/10/2019 - now complete		
42	Ensure Drinking Water Quality policy is communicated and understood by staff	Training	Closed	2018	Once policy has been adopted by council it is to communicated and understood by staff 15/10/2019 - all policies are submitted to the Consultative Committee for review and made available online for all staff.	Manger Production and Services	Added as part of review/development of DWMS
43	construct Flow diagrams of water supply system from catchment to consumer	Procedures and documentation	Complete	2017	flow diagrams were updated to be placed into DWMS		
44	Assemble pertinent information and document key characteristics of the water supply system	Procedures and documentation	Complete	2017	Information was generated for production of DWMS	Manger Production and Services	
45	Assemble a team with appropriate knowledge and expertise	Procedures and documentation	Closed	2019	Asset management asset required. 15/10/2019 - Water Quality team now established with more room to grow trainees in future years. Engineering team has	Manger Production and Services	

					gone from 3 to 5 staff with an independant manager.	
46	Identify existing preventive measures from catchment to consumer for each significant hazard or hazardous event and estimate the residual risk	Investigative studies	Complete	ongoing	Ongoing risk reviews and actions are undertaken upon incident reporting/lessons learnt scenarios. As the organisations asset and operational maturity increases so to will the levels of assessment and outcomes. - 1/9/2021 GWCC staff monitor and maintain its raw water systems via monthly monitoring lab results. In addition to that we are altered by any changes to Murrumbidgee discharges from Water NSW.	Low
47	Evaluate alternative or additional preventive measures where improvement is required		Closed	ongoing	25/8/2020 as per item 46 above	

48	Document all procedures and compile into an operations manual	Procedures and documentation	Closed	2019	SOPs have been generated and reviewed; they will need to be finalised. SWMS are currently being developed 15/10/2019 - All SOP's for WTP operations have now been complete. All documents have been made available on WaterOutlook. An operations manual is not deemed required at this stage.		Manger Production and Services
49	Identify procedures required for processes and activities from catchment to consumer	Procedures and documentation	Complete		See point 48 above. 15/10/2019 - This needs to be investigated and developed into a management plan for each supply scheme. - 1/9/2021 this is documented and managed as part of our DWMS and associated annual reviews.	Medium	Manger Production and Services

50	Ensure monitoring data is representative and reliable	Monitoring	Complete	ongoing	Ongoing data auditing every 12 months will help confirm data is representative of water supplies. 15/10/2019 - Wateroutlook provides monthly data reports for review by the water quality team. All data is reviewed annually for consideration of any new improvements required for data and operational consistancy.	Manger Production and Services
51	Determine the characteristics to be monitored in the distribution system and in water as supplied to the customer	Monitoring	Complete	2017	monitoring is carried out as per NSW Health drinking water Monitoring Program and operational requirments of GWCC.	
52	Establish and document a sampling plan for each characteristic, including the location and frequency of sampling	Monitoring	Complete	2017	Monitoring program to be audited every 12 months to ensure data is representative of the drinking water system	

53	Establish a consumer complaint and response program, including appropriate training of employee	Community engagement	Complete	2017	A register of customer complaints and outcomes and feedback to be developed. 15/10/2019 - CRM processes and indicators to be developed over the next 12 months with data recording and reporting mechanisms to be developed as well. This is an outstanding item in both Internal audit and NPR Audit. 25/8/2020 Draft operating proceedure for complaints handling completed - 1/9/2020 process is now business as usual with utilisation of councils customer service complaints system utilised to log and report on issues	Medium	Manger Production and Services
54	Define communication protocols with the involvement of relevent agencies and prepare a contact list of key people,	Procedures and documentation	Closed	2018	A register of conacts has been completed and Emergency Response Management Plan will need to be reviewed to add the list. 15/10/2019 - works now complete and reviewed annually.		

	agencies and businesses						
55	develop a public and media communuications strategy	Community engagement	Complete	2019	See Ryan for update. 15/10/2019 - complete		
56	Develop mechanisms and communication procedures to increase employees awareness of and participation in drinking water quality management	Procedures and documentation	Complete		Suggested by GM to have all staff trained in Cert II Water Operations. 15/10/2019 - induction based training should be undertaken by operational staff. Discussions with HR Coordinator to occur to develop long term plan. - 1/9/2021 GWCC issue relevant update emails, SOP's and guidelines to all staff when changes occur. Additional training including scenario training is undertaken as well. Scenario training was conducted with Bulk Councils involved in late 2020.	High	Manger Production and Services

57	Develop a comprehensive strategy for community consultation	Community engagement	Closed	2019	Have communications officer develop comms strategy. 15/10/2019 - Complete		
58	Assess requirements for effective community involvement	Community engagement	Complete	2019	15/10/2019 - As per Local Government Act, IP&R Framework and the Best Practice requirements for Water & Sewer.		
59	Use information to improve management of the Water Supply system	Investigative studies	Implemented	ongoing	Information will help GWCC to evolve with the requirements of its customers	Low	Manger Production and Services
60	establish programs to increase understanding of the water supply system	Community engagement	Complete	ongoing	Programs may include education of water quality, treatment processes, distribution works, new capital works etc - 1/9/2021 GWCC continue to develop hydraulic models, P&ID, and validation systems for Councils networks. Council have also developed and undertaken an education program called "Depth Days" which provides tours of Jugiong WTP and gives an overview of	Medium	Manger Production and Services

					catchment to tap process for students and/or community groups if requested.	
61	Validate processes and procedures to ensure that they are effective at controlling hazards	Procedures and documentation	Implemented		Ongoing assessment current procedures will help produce and highlight the need for new or additional processes or information	
62	Revalidate processes periodically or when variations in conditions occur	Procedures and documentation	Implemented		See Action and Improvement Plan Action item 61 above	
63	Validate the selection and design of new equipment and infrastructure to ensure continuing reliability	Investigative studies	Implemented	2017	Ongoing	
64	Periodically review documentation and revise as nessesary	Procedures and documentation	Implemented	2017	Ongoing document will be review and updated as per the document review dates	

65	develop a document control system to ensure current versions are in use	Procedures and documentation	Complete		Systematic approach with all review documents and their respective review dates to be determined and a suitable timeline developed to make sure all docs are updated as required 25/8/2020 all systems built into Water Outlook	High	Manger Production and Services
66	Establish a records management system and ensure that employees are trained to fill out records	Procedures and documentation	Implemented	2018	Wateroutlook is being developed by Safe group with a number of avenues of data collection to be made availble once fully rolled out. 15/10/2019 - Additional CRM system is avaialble for registering all documents, emails and correspondance		Manger Production and Services
67	Document information pertinent to all aspects of drinking water quality mangement	Procedures and documentation	Implemented		This will evolve as GWCC move forward, relevant information e.g. reservoir inspection sheets to be enetered into a database for reporting and so that any works can be followed up on and actioned if not complete	Very High	Manger Production and Services

68	produce an annual report to be made available to customers, regulatory authorities and stakeholders	Procedures and documentation	Implemented		DWMS Report may be made available once Water Quality Technical Officer has completed in July/August. 15/10/2019 - The annual report will be completed, submitted and made available to all relevant authorities in October of every year.	High	Manger Production and Services
69	establish procedures for effective internal and external reporting	Procedures and documentation	Closed	2017	The DWMS annual report to NSW Health will but completed for the first time by GWCC and the annual performance report will also be undertaken by GWCC staff as usual on an annual basis		
70	Document and report results	Monitoring	Complete	2017	This will an evolving and ongoing		
71	Collect and evaluate longterm data to assess performance and identify problems	Monitoring	Complete	2017	This will an evolving and ongoing		
72	Document and communicate audit results	Monitoring	Complete	2017	Audit results are always documented and communicated so that any issues can be attended to or so that good results are		

					communnicated for good reason			
73	Establish processes for internal and external audits	Procedures and documentation	Complete	2019	15/10/2019 - Internal Audit undertaken this year and shoulld be completed every 3 years. Consideration of external audits should be undertaken at least every 5 years.			
74	Evaluate the need for change	Investigative studies	Closed	ongoing				
75	Senior Executive review of the effectiveness of the management system	Investigative studies	Complete		15/10/2019 - Manex to review the Annual report and provide advice on any required changes. 25/8/2020 MANEX and council review annual report			
76	Bulk User Service Level Agreement	Procedures and documentation	In Progress	Ongoing	Formal Service level agreement be developed and implemented for councils bulk water users; and b) This action be included into action and improvement plan within DWMS 25/8/2020 Funding has been awarded for the facilitation and development of WQ SLA between GWCC- Hilltops	Medium	Manager production and Services	Part B has been added to action and improvements plan (Oct 2019); PART A is in progress, Staff have submitted a request to Public Health for the engagement of an external facilitator to undertake the development of a new Service Level Agreement between GWCC and its Bulk Customers. Project to commence upon approval from Public Health for funding of the Consultant.

					and GWCC and Coota Gundagai - 1/9/2021 Water Qual component has been completed and a draft is currently being developed by Lindsay Taylor Lawyers. - 1/11/22 draft SLA completed and currently under review. Change in staff at bulk councils has made it difficult to resolve outstanding items for agreement.			
77	Complaints Mangement System	Procedures and documentation	Implemented	Ongoing	Investigate options for a complaints handling system that integrates with Council's Asset Management and GIS Systems, and meets the requirements of the framework for the management of drinking water and Council's performance.	Medium	Manager production and Services	Management is unaware if a fully integrated complaints management system exists that could be implemented within GWCC cost effectively. However, Management will seek to improve its current capture of complaints through a more secure reporting system. This could be undertaken through tools such as Civica or WaterOutlook

78	Emergency response traiing	Training	Complete	ongoing	Incident and emergency response traiing to be developed and refererred to in DWMS and undertaken by relevent employees and stakeholders. (To be Included in DWMS) 25/8/2020 - Health have funded the facilitation of Emergency response training including bulk councils to occur 2020/21 - 1/9/2020 GWCC and Hilltops and CGRC all participated within a scenario training workshop held late 2020 at Jugiong WTP. Council also has developed Incident Protocols for water quality incidents that are to be used for management.	Medium	Manager production and Services	Managemet have issued a request for this scenario training to be funded and facilitated through Public Health. If funding and facilitated by Health GWCC will seek to undertake the training as soon as practicably possible. It should be noted that internal training is undertaken annualy for emergancy reponse maement at the Jugiong Water Treatment Plant as part of Council's Pollution Incident Response Management Plan. (HAS been included into DWMS under Traing)
79	Backflow Prevention	Procedures and documentation	Complete	2019	a) The Backflow Prevention Policy be referred to within the Drinking Water Management System; (COMPLETE under sectionRural Backflow Prevention Program) and b) Backflow device register be	Medium	Manager production and Services	Staff will include Backflow Prevention commentary within the DWMS Annual Report which is set to be completed and submitted to Council by December 2019.

					updated as required in accordance with the Backflow Prevention Policy (PP06). (Kevin will need to familiarise himself with this)			
80	Water Quality reporting	Procedures and documentation	Complete	2019	Consideration be given to making water quality information publicly available. For example, through the formal reporting to Council meetings, and/or making the DWMS Annual Reporting information available on Council's website.	Low	Manager Production and Services	Staff will submit the Annual DWMS Report to Council for acknowledgment between October and December every year. (Report will be submitted to December Council meeting and subsequently displayed on the public website for the public to see
81	Drinking Water Management System review	Procedures and documentation	Closed	30/06/2020	a) Following the annual review, the Drinking Water Management System be updated to reflect any changes that have been made; and b) Evidence of any review be retained such as meeting minutes, investigative studies, and reports to Council's Senior Management Team and/or Board Members.	low	Manager production and Services	As above

82	Evaluation and audit	Procedures and documentation	Complete	2019	a) Consult with the Local Public Health Unit to clarify their expectations regarding independent audit requirements; and b) Detail the scope and frequency of the independent audit of the Drinking Water Management System (DWMS) in the DWMS.	Low	Manager production and Services	Management are constantly engaged with Public Health and have formally requested a recommendation for a fixed auditing period. No fixed period has been provided, with feedback stating that a requirement for an independant and external audit will be required when Health direct GWCC to do so.

Appendix C - Full Reservoir Inspection Report 2019/20

Reservoir Critical Maintenance Priorities Report

11/07/2022

Date:	8/11/2021	**Client Name:**	Goldenfields Water
WS #:	014	**Reservoir Name:**	Bethungra No1 014
Asset No:	014	**Location:**	off Bethungra Rd
Job No:	027828	**Project Number:**	0
Cleaning Due:	8/11/2025	**Inspection Due:**	8/11/2025

External

Area	Priority	Status	Comments
Roof Platforms	2	A	There is no effective platform area present to work or rescue off if required
Handrails	2	A	There are no guard rails around the edge of the roof

Internal

Area	Priority	Status	Comments
Columns	1	A	The galvanised post base is corroded and the post is also deteriorated on the water line area. An Aquapost is an easy solution to fix the problem
Overflow	2	A	The overflow base is heavily corroded

Comments

External Comment:
There is no effective platform area present to work or rescue off if required

Internal Comment:
The galvanised post base is corroded and the post is also deteriorated on the water line area. An Aquapost is an easy
solution to fix the problem.

Reservoir Critical Maintenance Priorities Report

11/07/2022

Date:	8/11/2021	**Client Name:**	Goldenfields Water
WS #:	015	**Reservoir Name:**	Bethungra No2 015
Asset No:	015	**Location:**	off Bethungra Rd
Job No:	027829	**Project Number:**	0
Cleaning Due:	8/11/2025	**Inspection Due:**	8/11/2025

External

Area	Priority	Status	Comments
Entry Hatch	1	A	The entry hatch is not sealed or secured and contamination can enter the tank
Roof Platforms	2	A	There is no effective platform area present to work or rescue off if required
Handrails	2	A	There are no guard rails around the edge of the roof

Internal

Area	Priority	Status	Comments
Columns	1	A	The galvanised post base is corroded and the post is also deteriorated on the water line area. An Aquapost is an easy solution to fix the problem

Comments

External Comment:
The entry hatch is not sealed or secured and contamination can enter the tank.

Internal Comment:
The galvanised post base is corroded and the post is also deteriorated on the water line area. An Aquapost is an easy solution to fix the problem.

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Reservoir Critical Maintenance Priorities Report

11/07/2022

Date:	6/11/2021	**Client Name:**	Goldenfields Water
WS #:	018	**Reservoir Name:**	Black Range 18
Asset No:	18	**Location:**	off Kingsvale Rd Young
Job No:	027757	**Project Number:**	0
Cleaning Due:	6/11/2025	**Inspection Due:**	6/11/2025

External

Area	Priority	Status	Comments
Walls	1	A	There is calcification on the walls and significant spalling internally, so the external areas must also be suspect
Entry Hatch	1	A	The entry hatch cover is not sealed around the edges and where the ladder stiles extend through
Roof Platforms	1	A	The platform is not sealed around the entry hatch area
Roof Hatches	1	A	The hatch covers are not sealed around the edges
Level Indicator	1	A	The level indicator is non functional and should be removed. The roof pulley is creating an entry point for contamination events

Internal

Area	Priority	Status	Comments
Walls	1	A	There is severe concrete spalling on the upper wall area at 5 oclock. The horizontal reinforcing steel is exposed and heavily corroded
Overflow	2	F	The overflow riser is corroded
Ladder Internal	1	A	The internal ladder is heavily corroded and is not safe to use if the tank is empty. It should be replaced with a Nextep vertical FRP system 11600mm long

Comments

External Comment:
The entry hatch and rescue hatch covers are not sealed around the edges.

Internal Comment:
There is severe concrete spalling on the upper wall area at 5 oclock. The horizontal reinforcing steel is exposed and heavily

corroded. This issue should be addressed ASAP before further structural damage develops. The internal ladder is heavily
corroded and is not safe to use if the tank is empty. It should be replaced with a Nextep vertical FRP system 11600mm long.

Reservoir Critical Maintenance Priorities Report

11/07/2022

Date:	8/11/2021	**Client Name:**	Goldenfields Water
WS #:	037	**Reservoir Name:**	Dirnaseer No1 037
Asset No:	037	**Location:**	off Dirnaseer Rd
Job No:	027826	**Project Number:**	0
Cleaning Due:	8/11/2025	**Inspection Due:**	8/11/2025

External

Area	Priority	Status	Comments
Roof Platforms	2	A	There is no effective platform area present to work or rescue off if required
Handrails	2	F	There are no guard rails around the edge of the roof
Ventilation	2	A	One turbine vent is missing, but the opening is closed off

Internal

Area	Priority	Status	Comments

Comments

External Comment:
There is no effective platform area present to work or rescue off if required.

Internal Comment:
The internal areas appear to be in good condition.

Reservoir Critical Maintenance Priorities Report

11/07/2022

Date:	8/11/2021	**Client Name:**	Goldenfields Water
WS #:	038	**Reservoir Name:**	Dirnaseer No2 038
Asset No:	038	**Location:**	off Dirnaseer Rd
Job No:	027827	**Project Number:**	0
Cleaning Due:	8/11/2025	**Inspection Due:**	8/11/2025

External

Area	Priority	Status	Comments
Roof Platforms	2	A	There is no effective platform area present to work or rescue off if required
Handrails	2	F	There are no guard rails around the edge of the roof

Internal

Area	Priority	Status	Comments
Columns	2	F	The concrete mound around the post base is breaking up

Comments

External Comment:
There is no effective platform area present to work or rescue off if required

Internal Comment:
The concrete mound around the post base is breaking up.

Goldenfields Water

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Reservoir Critical Maintenance Priorities Report

11/07/2022

Date:	7/11/2021	**Client Name:**	Goldenfields Water
WS #:	042	**Reservoir Name:**	Frampton No1 042
Asset No:	042	**Location:**	off Olympic Hwy
Job No:	027822	**Project Number:**	0
Cleaning Due:	7/11/2025	**Inspection Due:**	7/11/2025

External

Area	Priority	Status	Comments
Walls	2	A	There are significant cracks present, particularly around the base areas, where weepage may be occurring
Entry Hatch	1	A	The entry hatch cover is lightweight and could be bent upwards when locked. It is also unsealed around the edges
Roof Platforms	1	A	There is no effective platform area present to work or rescue off if required
Ventilation	2	A	There is no ventilation system in place, but the roof edge ridge caps are allowing air flow to occur

Internal

Area	Priority	Status	Comments
Walls	2	A	The external cracks will be mirrored internally
Columns	1	A	The post base has corroded through and is only sitting on the floor area
Roof Spider	2	A	The connections are corroded, so replacement is recommended
Roof Framing	1	A	The roof framing has significant corrosion present and will need to be replaced soon, before the roof fails

Comments

External Comment:

There are significant cracks present, particularly around the base areas, where weepage may be occurring. The entry hatch cover is lightweight and could be bent upwards when locked. It is also unsealed around the edges.

Internal Comment:

The roof framing has significant corrosion present and will need to be replaced soon, before the roof fails.

Reservoir Critical Maintenance Priorities Report

11/07/2022

Date:	7/11/2021	**Client Name:**	Goldenfields Water
WS #:	043	**Reservoir Name:**	Frampton No2 043
Asset No:	043	**Location:**	off Olympic Hwy
Job No:	027823	**Project Number:**	0
Cleaning Due:	7/11/2025	**Inspection Due:**	7/11/2025

External

Area	Priority	Status	Comments
Walls	2	A	There are significant cracks present, particularly around the base areas, where weepage may be occurring
Entry Hatch	1	A	The entry hatch cover is lightweight and could be bent upwards when locked. It is also unsealed around the edges
Roof Platforms	1	A	There is no effective platform area present to work or rescue off if required
Ventilation	2	A	There is no ventilation system in place, but the roof edge ridge caps are allowing air flow to occur

Internal

Area	Priority	Status	Comments
Walls	2	A	The external cracks will be mirrored internally
Columns	1	A	The post base has corroded through and is only sitting on the floor area
Roof Framing	2	A	The framing has surface corrosion and is lightweight

Comments

External Comment:
There are significant cracks present, particularly around the base areas, where weepage may be occurring. The entry hatch cover is lightweight and could be bent upwards when locked. It is also unsealed around the edges.

Internal Comment:
The post base has corroded through and is only sitting on the floor area.

Reservoir Critical Maintenance Priorities Report

11/07/2022

Date:	9/11/2021	**Client Name:**	Goldenfields Water
WS #:	053	**Reservoir Name:**	Illabo No1 053
Asset No:	053	**Location:**	off Stanyer Rd
Job No:	027830	**Project Number:**	0
Cleaning Due:	9/11/2025	**Inspection Due:**	9/11/2025

External

Area	Priority	Status	Comments
Walls	2	F	There are a few minor weeps around the external wall base area

Internal

Area	Priority	Status	Comments
Roof Framing main rafters and	2	A	The roof framing has significant corrosion present on the the wall connection areas, which are uncoated

Comments

External Comment:
There are a few minor weeps around the external wall base area.

Internal Comment:
The roof framing has significant corrosion present on the main rafters and the wall connection areas, which are uncoated.

Reservoir Critical Maintenance Priorities Report

11/07/2022

Date:	9/11/2021	**Client Name:**	Goldenfields Water
WS #:	054	**Reservoir Name:**	Illabo No2 054
Asset No:	054	**Location:**	off Stanyer Rd
Job No:	027831	**Project Number:**	0
Cleaning Due:	9/11/2025	**Inspection Due:**	9/11/2025

External

Area	Priority	Status	Comments
Walls	2	F	There are a few minor weeps around the external wall base area

Internal

Area	Priority	Status	Comments
Roof Framing main rafters and	2	A	The roof framing has significant corrosion present on the the wall connection areas, which are uncoated

Comments

External Comment:
There are a few minor weeps around the external wall base area.

Internal Comment:
The roof framing has significant corrosion present on the main rafters and the wall connection areas, which are uncoated.

Reservoir Critical Maintenance Priorities Report

11/07/2022

Date:	21/03/2022	**Client Name:**	Goldenfields Water
WS #:	055	**Reservoir Name:**	Jugiong BT 055
Asset No:	055	**Location:**	off Rosehill Rd
Job No:	027913	**Project Number:**	0
Cleaning Due:	21/3/2026	**Inspection Due:**	21/3/2026

External

Area	Priority	Status	Comments

Internal

Area	Priority	Status	Comments
Columns	2	F	The galvanised coating is deteriorated
Ladder Internal	2	F	The existing ladders, platform and upper cage section need to be replaced with an FRP vertical ladder system when the tank is re-coated

Comments

External Comment:
There is no secure compound around the tank but it is fairly isolated and no vandalism activity is present.

Internal Comment:
The overall internal coating is stained but there is no significant corrosion present at this time. The galvanised areas such as the centre post, overflow support brackets and internal ladder system appear to have micro biological corrosion nodules present on the surfaces.

Reservoir Critical Maintenance Priorities Report

11/07/2022

Date:	21/03/2022	**Client Name:**	Goldenfields Water
WS #:	056	**Reservoir Name:**	Jugiong CWT 056
Asset No:	056	**Location:**	Jugiong WTP
Job No:	027914	**Project Number:**	0
Cleaning Due:	21/3/2026	**Inspection Due:**	21/3/2026

External

Area	Priority	Status	Comments

Internal

Area	Priority	Status	Comments
Ladder Internal	2	F	The galvanised ladder and platform has corrosion present. It should be replaced with a Nextep FRP vertical ladder 9300mm long

Comments

External Comment:
The security enclosure for the ladder is showing signs of surface corrosion.

Internal Comment:
There is one minor section of concrete spalling present, due to shallow steel cover. The galvanised ladder and platform has
corrosion present - it should be replaced with a Nextep FRP vertical ladder 9300mm long.

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Reservoir Critical Maintenance Priorities Report

11/07/2022

Date:	7/11/2021	**Client Name:**	Goldenfields Water
WS #:	063	**Reservoir Name:**	Mannings Road No1 063
Asset No:	063	**Location:**	290 Old Cootumundra Rd Cootamundra
Job No:	027824	**Project Number:**	0
Cleaning Due:	7/11/2025	**Inspection Due:**	7/11/2025

External

Area	Priority	Status	Comments
Walls	2	A	The concrete walls have cracks present along the base area
Roof Platforms	2	A	There is no safe working area on the roof
Ventilation	2	F	One turbine roof vent appears to have frozen

Internal

Area	Priority	Status	Comments

Comments

External Comment:
The concrete walls have cracks present but nothing is evident internally. One turbine roof vent appears to have frozen.

Internal Comment:
The internal areas appear to be OK.

Reservoir Critical Maintenance Priorities Report

11/07/2022

Date:	7/11/2021	**Client Name:**	Goldenfields Water
WS #:	064	**Reservoir Name:**	Mannings Road No2 064
Asset No:	0	**Location:**	290 Old Cootumundra Rd Cootamundra
Job No:	027825	**Project Number:**	0
Cleaning Due:	7/11/2025	**Inspection Due:**	7/11/2025

External

Area	Priority	Status	Comments
Roof Platforms	2	A	There is no safe working area on the roof

Internal

Area	Priority	Status	Comments

Comments

External Comment:
The concrete walls have cracks present but nothing is evident internally.

Internal Comment:
The internal areas appear to be OK.

No Comment

Goldenfields Water

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Reservoir Critical Maintenance Priorities Report

11/07/2022

Date:	9/11/2021	**Client Name:**	Goldenfields Water
WS #:	068	**Reservoir Name:**	Marrar Pinnacle No1 068
Asset No:	068	**Location:**	off Rockview Rd Marrar Pinnacle
Job No:	027832	**Project Number:**	0
Cleaning Due:	9/11/2025	**Inspection Due:**	9/11/2025

External

Area	Priority	Status	Comments
Entry Hatch	2	F	The entry hatch is small for a safe diver entry or rescue situation. It should be enlarged when the platform is upgraded
Handrails	2	A	An improved guard rail system is required to upgrade personnel safety around the platform area

Internal

Area	Priority	Status	Comments
Roof Framing	2	A	The two main roof beams are un-coated and have heavy surface corrosion present. This should not present a structural issue in the short term (5 years), but they should be monitored for future deterioration
Ladder Internal	2	F	The galvanised ladder has corrosion present. It needs to be replaced with a Nextep FRP ladder 4300mm long

Comments

External Comment:
The entry hatch is small for a safe diver entry or rescue situation. It should be enlarged when the platform is upgraded. An improved guard rail system is also required to upgrade personnel safety around the platform area.

Internal Comment:
The two main roof beams are un-coated and have heavy surface corrosion present. This should not present a structural issue in the short term (5 years), but they should be monitored for future deterioration. The galvanised

ladder has surface
corrosion present. It needs to be replaced with a Nextep FRP ladder 4300mm long.

External Comment:
No Comment

Internal Comment:
No Comment

Reservoir Critical Maintenance Priorities Report

11/07/2022

Date:	20/03/2022	**Client Name:**	Goldenfields Water
WS #:	105	**Reservoir Name:**	Wantabadgery No1 105
Asset No:	105	**Location:**	off Mcgledes Hill Rd
Job No:	027911	**Project Number:**	0
Cleaning Due:	20/3/2026	**Inspection Due:**	20/3/2026

External

Area	Priority	Status	Comments
Walls	1	A	There are some significant weeping horizontal cracks in the walls
Entry Hatch	1	A	The small entry hatch is neither secure against unauthorised access or sealed against contamination ingress
Roof Platforms	1	Na	There is no dedicated platform set up on the roof area
Roof Hatches	2	F	The roof hatch is also unsealed
Handrails	1	A	There are no guard rails around the edge of the roof or entry hatch area
Ventilation	2	F	The edges of the roof sheets will be allowing the tank to vent

Internal

Area	Priority	Status	Comments
Walls	1	A	There are some significant weeping horizontal cracks in the walls which are mirrored externally. The cracks are too numerous to repair, so an internal liner may be a good medium term solution to extend the life of the tank
Columns	1	A	The centre roof support post is heavily corroded and should

be replaced			with an Aquapost. The corroded base plate is 400mm square
Outlet	2	F	The penetration is heavily corroded
Overflow	2	F	The overflow base is heavily corroded

Comments

External Comment:
The small entry hatch is neither secure against unauthorised access or sealed against contamination ingress. There are some significant weeping horizontal cracks in the walls which are mirrored internally. The cracks are too numerous to repair, so an internal liner may be a good medium term solution to extend the life of the tank.

Internal Comment:
The centre roof support post is heavily corroded and should be replaced with an Aquapost. The corroded base plate is 400mm square.

Reservoir Critical Maintenance Priorities Report

11/07/2022

Date:	20/03/2022	**Client Name:**	Goldenfields Water
WS #:	106	**Reservoir Name:**	Wantabadgery No2 106
Asset No:	106	**Location:**	off Mcgledes Hill Rd
Job No:	027912	**Project Number:**	0
Cleaning Due:	20/3/2026	**Inspection Due:**	20/3/2026

External

Area	Priority	Status	Comments
Entry Hatch	1	A	The small entry hatch is neither secure against unauthorised access or sealed against contamination ingress
Roof Platforms	1	A	There is no dedicated platform set up on the roof area
Roof Hatches	2	F	The roof hatch is also unsealed
Handrails	1	A	There are no guard rails around the edge of the roof or entry hatch area
Ventilation	2	F	The edges of the roof sheets will be allowing the tank to vent

Internal

Area	Priority	Status	Comments
Columns	1	A	The centre roof support post is heavily corroded and should be replaced with an Aquapost. The corroded base plate is 400mm square
Outlet	2	F	The penetration is heavily corroded
Overflow	2	F	The overflow base is heavily corroded

Comments

External Comment:
The small entry hatch is neither secure against unauthorised access or sealed against contamination ingress.

Internal Comment:
The centre roof support post is heavily corroded and should be replaced with an Aquapost. The corroded base plate is
400mm square.

Reservoir Critical Maintenance Priorities Report

11/07/2022

Date:	12/07/2021	**Client Name:**	Goldenfields Water
WS #:	112	**Reservoir Name:**	West Wyalong Terminal 112
Asset No:	103451637	**Location:**	off the Mid Western Hwy West Wyalong
Job No:	027767	**Project Number:**	0
Cleaning Due:	12/7/2025	**Inspection Due:**	12/7/2025

External

Area	Priority	Status	Comments

Internal

Area	Priority	Status	Comments
Walls	2	F	There have been a lot of patch repairs carried out, but no obvious corrosion is present. There are some patches of iron oxide on the upper walls but these do not appear to be causing any deterioration to the coating
Floor	2	A	There have been a significant number of patch repairs carried out across the floor, some better than others. There is no obvious corrosion present and CP has been upgraded to a more effective impressed system
Overflow	2	F	The overflow riser is asbestos cement pipe and should be replaced when the tank is recoated

Comments

External Comment:
The external areas appear to be OK.

Internal Comment:
There have been a significant number of patch repairs carried out across the floor, some better than others. There is no obvious corrosion present and CP has been upgraded to a more effective impressed system.

Reservoir Critical Maintenance Priorities Report

11/07/2022

Date:	11/07/2021	**Client Name:**	Goldenfields Water
WS #:	110	**Reservoir Name:**	Wyalong BT 110
Asset No:	110	**Location:**	Depot at cnr Newell Hwy and Goldenfields Way
Job No:	027766	**Project Number:**	0
Cleaning Due:	11/7/2025	**Inspection Due:**	11/7/2025

External

Area	Priority	Status	Comments

Internal

Area	Priority	Status	Comments

Comments

External Comment:
The external areas have been renovated and appear to be in good condition.

Internal Comment:
The internal areas have been recoated and appear to be in good condition, now that some patch repairs were carried out on
the floor during the warranty defects inspection.

Reservoir Critical Maintenance Priorities Report

11/07/2022

Date:	13/07/2021	**Client Name:**	Goldenfields Water
WS #:	115	**Reservoir Name:**	Young Terminal 115
Asset No:	115	**Location:**	off Kingsvale Rd Young
Job No:	027760	**Project Number:**	0
Cleaning Due:	13/7/2025	**Inspection Due:**	13/7/2025

External

Area	Priority	Status	Comments
Roof Hatches and there is no	2	A	The roof hatch at 11 oclock has upstream ponding present lock fitted

Internal

Area	Priority	Status	Comments
Overflow delaminating	2	A	The upper section of the asbestos cement riser is

Comments

External Comment:
The platform and entry hatch areas have been renovated and now appear to be sealed against contamination events.
Padlocks are required on both the entry hatch and roof hatch to secure them from unauthorised access.

Internal Comment:
The upper section of the asbestos cement overflow riser is delaminating.

Appendix D - External Auditor Report Summary

Table 39. External auditor report summary

Number	Issue	Risk Rating	Recommendation	Management Response	Responsible Person	Action Date
1	Bulk User Service Level Agreements	Medium	a) Formal service level agreements be developed and implemented for Council's bulk water users; and b) This action be included in the Action and Improvement Plan within the Drinking Water Management System	Staff have submitted a request to Public Health for the engagement of an external facilitator to undertake the development of a new Service Level Agreement between GWCC and its Bulk Customers. Project to commence upon approval from Public Health for funding of the Consultant.	Manager Production & Services	Aug-20
2	Complaints Management	Medium	Investigate options for a complaints handling system that integrates with Council's Asset Management and GIS Systems, and meets the requirements of the framework for the management of drinking water and Council's performance.	Management is unaware if a fully integrated complaints management system exists that could be implemented within GWCC cost effectively. However, Management will seek to improve its current capture of complaints through a more secure reporting system. This could be undertaken through tools such as Civica or WaterOutlook	Manager Corporate Services	Jun-21

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Number	Issue	Risk Rating	Recommendation	Management Response	Responsible Person	Action Date
3	Emergency Response Training	Medium	Incident and emergency response plan training be developed and referred to in the Drinking Water Management System and undertaken by relevant employees and external stakeholders.	Management have issued a request for this scenario training to be funded and facilitated through Public Health. If funding and facilitated by Health GWCC will seek to undertake the training as soon as practicably possible. It should be noted that internal training is undertaken annually for emergency response management at the Jugiong Water Treatment Plant as part of Council's Pollution Incident Response Management Plan.	Manager Production & Services	Dec-20
4	Backflow Prevention	Medium	a) The Backflow Prevention Policy be referred to within the Drinking Water Management System; and b) Backflow device register be updated as required in accordance with the Backflow Prevention Policy (PP06).	Staff will include Backflow Prevention commentary within the DWMS Annual Report which is set to be completed and submitted to Council by December 2019.	Manager Production & Services	Ongoing

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Number	Issue	Risk Rating	Recommendation	Management Response	Responsible Person	Action Date
5	Water Quality Reporting	Low	Consideration be given to making water quality information publicly available. For example, through the formal reporting to Council meetings, and/or making the DWMS Annual Reporting information available on Council's website.	Staff will submit the Annual DWMS Report to Council for acknowledgment between October and December every year.	Manager Production & Services	Ongoing
6	Drinking Water Management System Review	Low	a) Following the annual review, the Drinking Water Management System be updated to reflect any changes that have been made; and b) Evidence of any review be retained such as meeting minutes, investigative studies, and reports to Council's Senior Management Team and/or Board Members.	As per item 5 above. Staff will submit the Annual report to Council between the October and December period. The report will highlight any issues, modifications and achievements gained throughout the year.	Manager Production & Services	Ongoing

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Number	Issue	Risk Rating	Recommendation	Management Response	Responsible Person	Action Date
7	Evaluation and Audit	Low	a) Consult with the Local Public Health Unit to clarify their expectations regarding independent audit requirements; and b) Detail the scope and frequency of the independent audit of the Drinking Water Management System (DWMS) in the DWMS.	Management are constantly engaged with Public Health and have formally requested a recommendation for a fixed auditing period. No fixed period has been provided, with feedback stating that a requirement for an independent and external audit will be required when Health direct GWCC to do so.	Manager Production & Services	Complete

Goldenfields Water

Drinking Water Management System

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1 INFORMATION ABOUT THIS DOCUMENT

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3 TABLES

4 FIGURES

5 EXECUTIVE SUMMARY

5.1 Document Purpose

This document and the supporting systems demonstrate Goldenfields Water County Council (GWCC) compliance with the requirement of s25 *Public Health Act 2010* to develop a Quality Assurance Program in line with the Framework for Drinking Water Quality Management in the Australian Drinking Water Guidelines 2011 v3.4 (NHMRC 2017). This document acts as a roadmap of the activities that Council undertakes to ensure the provision of safe drinking water to its customers.

5.2 Critical Control Points

The day to day safety of the water is maintained at critical control points (CCP) and it is a requirement of Drinking Water Management System (DWMS) development that CCPs are developed and critical limits assigned.

CCPs for the each of GWCC water supply systems are shown in appendix B.

5.3 Action and Improvement Plan

A number of actions were identified through the risk assessment and plan development. These have been added to action and improvement plan and assigned to staff members and contractors/consultants to follow-up. The Action and Improvement Plan is reviewed regularly as actions are completed and as part of the annual planning cycle.

The action and improvement plan is included in appendix C.

5.4 Sys[redacted] Review

The Drinking Water Management System should be reviewed internally on an annual basis, and by an independent party every 5 years (or as advised by NSW Health).

6 INTRODUCTION

The NSW *Public Health Act 2010* (the Act) was passed by Parliament at the end of 2010. The Act includes the requirement for water suppliers to produce a *Quality Assurance Program* (QAP). This document forms Goldenfields Water County Council (GWCC) response to the development of a QAP for its water supply schemes, and is based on the 12 Elements, 32 Components and 76 Actions of the Framework for Drinking Water Quality Management in the Australian Drinking Water Guidelines 2011 v3.4 (NHMRC 2017).

7 PURPOSE

This document acts as a roadmap for the activities that Council undertakes to ensure the provision of safe drinking water to its customers.

The document is supported by a range of procedures, registers, data management systems, flow diagrams and process and instrumentation diagrams which are all referenced at the appropriate points in this document.

This plan and the supporting documentation are living documents that should be reviewed and updated in a timely manner.

8 ELEMENT ROADMAP

8.1 Element 1: Commitment to Drinking Water Quality Management

8.1.1 Drinking Water Quality Policy

Formulate a drinking water quality policy, endorsed by senior executives, to be implemented throughout the organisation. Ensure that the policy is visible and is communicated, understood and implemented by employees.

Goldenfields Water is committed to managing its drinking water supply systems to provide a safe, high quality drinking water which consistently meets the requirements of ADWG, consumer expectations and regulatory requirements.

The development and implementation of the DWMS formalises and demonstrates Goldenfields Water's commitment to drinking water quality management throughout the organisation by:

- Defining Goldenfields Water's role and responsibility in regards to providing high quality drinking water
- Identifying and assessing risks associated with the drinking water system and introducing controls, preventive measures, appropriate training, procedures and emergency response plans to protect drinking water quality and public health
- Adopting a measurable Improvement Plan that will increase the integrity of the DWMS
- Reinforcing the ongoing and active involvement of all staff and supports senior management to ensure actions and policies support the management of drinking water quality

Action: Drinking water quality policy to be developed, endorsed by senior executives and communicated to employees.

8.1.2 [redacted]mal requ[redacted]

Identify and document all relevant regulatory and formal requirements. Ensure responsibilities are understood and communicated to employees. Review requirements periodically to reflect any changes.

The regulatory and formal requirements relating to drinking water quality in systems managed by Goldenfields Water have been identified and detailed in Table 8-1. Goldenfields Water has commenced a process to develop a formal water quality agreement with the Bulk Water Supply of Hilltops Council and Cootamundra-Gundagai Regional Council.

Table 8-1. Key formal requirements relating to water quality

Instrument	Jurisdiction	Type	Relevance
Competition and Consumer Act 2010	Commonwealth		Replaces the T*rade Practices Act 1974* and incorporates Schedule 2 – The Australian Consumer Law. As a "seller" of water, the local council is subject to provisions of Consumer transactions and Consumer guarantees, which guarantees that the goods supplied are reasonably fit for purpose
AS/NZS 3500.0 to 4:2003 - Plumbing and Drainage Set	National	Standard	Largely for management of the distribution system including standards for plumbing and drainage issues
Plumbing Code of Australia (National Construction Code Series 2013)	National	Standard	Largely for management of the distribution system including standards for plumbing and drainage issues
Australian Drinking Water Guidelines 2011	National	Guideline	Sets frameworks and guidance for the provision of safe, quality drinking water
Local Government Act 1993	NSW	Statute	Urban water services and management/review of on-site sewage management systems; Have only persons licensed or certified under the Home Building Act 1989 (or supervised by such a person) carry out any water supply work, sewerage work or stormwater drainage work Preparation of Asset Management Plans
Public Health Act 2010	NSW	Statute	Protection of public health, follow any advice issued from the Chief of Health regarding drinking water safety to the public; sample drinking water in accordance with NSW Health recommendations. Prepare a drinking water management system
Public Health Regulation 2012	NSW	Regulation	Requirement to have a quality assurance program (QAP) in place that addresses the elements of the Framework as set

Instrument	Jurisdiction	Type	Relevance
			out in the ADWG. A copy of the most recent QAP is to be provided to the Director-General who may arrange a review of the QAP at any time.
Protection of the Environment Operations Act 1997	NSW	Statute	Environment protection including licensed discharges
NSW Water and Sewerage Strategic Business Planning Guidelines	NSW	Guidelines	Prepare Strategic Business plans including a review of the operating environment and IWCM which should identify key water quality issues in the catchment.
NSW Health Drinking Water Monitoring Program	NSW	Guidelines	Free-of-charge testing for water supply system monitoring for indicator bacteria and health-related inorganic chemicals. Includes NSW Health Response Protocols for chemical and quality, treatment failure and *Cryptosporidium* and *Giardia*.
Fluoridation of Public Water Supplies Act 1957 No 58	NSW	Statute	Authorises and controls the addition of fluorine to public water supplies and for purposes connected to the supply.
Fluoridation of Public Water Supplies Regulation 2012	NSW	Statute	Made under the Fluoridation of Public Water Supplies Act 1957, relating to correct fluoride dosing equipment; collection, supply and analysis of water samples; provision of results monthly.
Environmental Planning and Assessment Act 1979 No 203	NSW	Statute	Proper management, development and conservation of resources including water for the welfare of the community and environment.

8.1.3 Engaging stakeholders

Identify all stakeholders who could affect, or be affected by, decisions or activities of the drinking water supplier.
Develop appropriate mechanisms and documentation for stakeholder commitment and involvement.
Regularly update the list of relevant agencies.

Stakeholders involved in the provision of a safe reliable drinking water supply have been identified and are listed in Table 8-2.

Table 8-2. GWCC Stakeholders

Stakeholder	
Constituent councils	Goldenfields and Hilltops Council bulk user agreement Goldenfields and Cootamundra-Gundagai Regional Council

Stakeholder	
General stakeholders	Stakeholders list
NSW Health	Provides water analysis through the NSW Health Drinking Water Monitoring Program. NSW Health response protocol to microbial and physical and chemical exceedances Representatives from the Local Public Health Unit and NSW Health Water Unit participated in site visits and the Risk Assessment Workshop as part of the development of the DWMS
DPI Water (formerly NSW Office of Water)	Inspector visits and assesses WTPs compliance every three months. Technical support on investigations, design, construction, operation, maintenance and management Annual Reporting on Water Supply performance Participated in Site Visits and Risk Assessment Workshops as part of the Goldenfields Water DWMS
Riverina Local Land Services	It is recommended that Goldenfields Water liaises with Local Land Services regarding the management of water quality in the drinking water catchment

8.2 Element 2: Assessment of the Drinking Water Supply System

8.2.1 Water Supply system analysis

Assemble a team with appropriate knowledge and expertise.
Construct a flow diagram of the water supply system from catchment to consumer.
Assemble pertinent information and document key characteristics of the water supply system to be considered.

Goldenfields Water operates four drinking water supply systems. A summary of these drinking water systems is included in this section.

TABLE 9.3 OVERVIEW OF GOLDENFIELDS WATER: DRINKING WATER SUPPLY SYSTEMS

Process	Jugiong	Oura	Mt Arthur	Mt Daylight
Catchment	Murrumbidgee River catchment	Murrumbidgee inland alluvial aquifer	Lachlan Fold Belt aquifer system	Lower Lachlan alluvium aquifer
Source water	Murrumbidgee River	Oura Borefield - three bores: 3, 4 and 6	Mt Arthur Borefield - two bores: 1 and 2	Mt Daylight Borefield - two bores jointly operated with Carrathool Shire Council. Carrathool Shire Council is responsible for bore management
Water treatment	Jugiong WTP (40 ML/day): Coagulation	Treatment process: Aeration	Treatment process: Disinfection	Treatment process: Disinfection

Process	Jugiong	Oura	Mt Arthur	Mt Daylight
	Flocculation Clarification Filtration Disinfection Fluoridation	Disinfection Fluoridation		
Reservoirs	14 reservoirs	33 reservoirs	9 reservoirs	7 reservoirs
Reticulation	Bulk supply: Cootamundra Shire: pop. 6,800 Harden Shire: pop. 2,200 Young Shire: pop. 8,000 Retail supply to approximately 600 people in the villages of Stockinbingal, Wallendbeen and Springdale	Retail supply to approximately 14,600 people in Bland, Coolamon, Junee, Narranderra and Temora Shire Councils. This system can also supply to the northern side of Wagga Wagga Shire Council, when required	Retail supply to approximately 2,400 people in Coolamon Shire	Retail supply to 125 people in the villages of Naradhan, Weethalle and Tallimba in Bland Shire Council

***Source**: HydroScience, 2015*

Water supply system information, including a flow diagram of the water supply system from catchment to consumer, information and key characteristics of the water supply system are shown in:

Jugiong Water Supply system – Appendix D
Oura water supply system – Appendix E
Mt Arthur water supply system – Appendix F
Mt Daylight water supply system – Appendix G

A list of drinking water supply system analyses is summarised in Table 8-3.

Table 8-3. Assessment of water supply system

Document	Water supply systems	Includes	Reference
Risk assessment briefing paper, 2014	Jugiong, Oura, Mt Arthur and Mt Daylight water supply systems	• Analysis of historical water quality data • Flow diagram of water supply system from system to tap	HydroScience, 2015, Technical Note 1: Risk Assessment Workshop Briefing Paper: Drinking Water Systems Analysis.
Risk assessment workshop, 28 July to 1 August 2014	Jugiong, Oura, Mt Arthur and Mt Daylight water supply systems	• Risk assessment workshop outputs	HydroScience, 2015, Technical Note 2: Risk Assessment and Critical Control Point Workshop.

8.2.2 Assessment of water quality data

- Assemble historical data from source waters, treatment plants and finished water supplied to consumers (over time and following specific events).
- List and examine exceedances.
- Assess data using tools such as control charts and trends analysis to identify trends and potential problems.

Historical water quality data was assessed as part of the risk assessment process as summarised in Table 8-3.

8.2.3 Hazard identification and risk assessment

Define the approach and methodology to be used for hazard identification and risk assessment.
Identify and document hazards, sources and hazardous events for each component of the water supply system.
Estimate the level of risk for each identified hazard or hazardous event.
Evaluate the major sources of uncertainty associated with each hazard and hazardous event and consider actions to reduce uncertainty.
Determine significant risks and document priorities for risk management.
Periodically review and update the hazard identification and risk assessment to incorporate any changes.

A list of hazard identification and risk assessment are summarised in Table 8-4, with referenced documents included in appendix A.

Table 8-4. Assessment of water supply system

Document	Water supply systems	Includes	Reference
Risk assessment briefing paper, 2014	Jugiong, Oura, Mt Arthur and Mt Daylight water supply systems	• Hazard identification and risk assessment methodology	HydroScience, 2015, Technical Note 1: Risk Assessment Workshop Briefing Paper: Drinking Water Systems Analysis.
Risk assessment workshop, 28 July to 1 August 2014	Jugiong, Oura, Mt Arthur and Mt Daylight water supply systems	Documentation of • Hazards, sources and hazardous events • Level of risk for each identified hazard or hazardous event • Risk estimation • Significant risks and priorities	HydroScience, 2015, Technical Note 2: Risk Assessment and Critical Control Point Workshop.

8.3 Element 3: Preventive Measure for drinking Water Quality Management

8.3.1 Preventative measures and multiple barriers

- Identify existing preventive measures from catchment to consumer for each significant hazard or hazardous event and estimate the residual risk.
- Evaluate alternative or additional preventive measures where improvement is required.

A list of preventative measures and multiple barriers are summarised in Table 8-5, with referenced documents included in appendix A.

Table 8-5. Assessment of water supply system

Document	Water supply systems	Includes	Reference
Risk assessment workshop, 28 July to 1 August 2014	Jugiong, Oura, Mt Arthur and Mt Daylight water supply systems	Documentation of identifications of recommendations for additional preventative measures	HydroScience, 2015, Technical Note 2: Risk Assessment and Critical Control Point Workshop.

8.3.2 Critical Control Points

- Assess preventive measures from catchment to consumer to identify critical control points.
- Establish mechanisms for operational control.
- Document the critical control points, critical limits and target criteria.

As part of the development of the drinking water management system, key operating procedures and corrective actions were established for each Critical Control Point (CCP) within the Jugiong, Oura, Mt Arthur and Mt Daylight drinking water supply systems. These included operational procedures required to achieve the target levels and corrective actions in the event that the alert levels or critical limits are reached.

Critical control points are included in appendix B.

8.4 Element 4: Operations Procedures and Process Control

8.4.1 Operational Procedures

- Identify procedures required for processes and activities from catchment to consumer.
- Document all procedures and compile into an operations manual.

Operational procedures formalise the system specific activities that are essential to ensure the provision of consistently good quality water. The ADWG requires detailed procedures for the operation of all processes and activities (both ongoing and periodic) from catchment to consumer,

including preventive measures, operational monitoring and verification procedures, and maintenance requirements. A standard operating procedure (SOP) is a set of written instructions that will document the routine activities undertaken by Goldenfields Water staff in the delivery of consistent, high quality water. The development and use of SOPs are an integral part of a successful quality system as it provides Goldenfields Water staff with the information to perform a job consistently, effectively, and efficiently which facilitates consistency in the quality of water supplied to consumers.

DPI Water requires each local water utility to ensure that the SOPs for its drinking water supply system must meet the key barriers described in section 6.4. SOPs and incident response procedures have been developed for the CCPs, which are available in appendix B of the DWMS.

Action: It is recommended that Goldenfields Water develop SOPs for key operations including mains break repair and mains flushing procedure to ensure that the distribution integrity is upheld and that chlorine residual is maintained.

8.4.2 Operational Monitoring

- Develop monitoring protocols for operational performance of the water supply system, including the selection of operational parameters and criteria, and the routine analysis of results.
- Document monitoring protocols into an operational monitoring plan.

Goldenfields Water employs a range of manual and online sampling techniques to monitor operational water quality. Online instruments and manual sampling and testing within the distribution and reticulation system are used to monitor and verify system performance. Manually collected data is recorded both electronically and in log books located at Jugiong WTP, Oura Borefield, and Cootamundra Depot. Electronic records are held at Jugiong WTP and the Goldenfields Water head office in Temora. Goldenfields Water has also developed a chlorine monitoring system; whereby real-time data is recorded by online instruments or entered manually by operators to model the chlorine levels and chlorine consumption within the distribution system. Goldenfields Water is currently working to increase its remote monitoring system to ensure that all of its drinking water supply systems are appropriately and efficiently monitored.

Operational monitoring programs for Jugiong, Oura, Mt Arthur and Mt Daylight are shown in Table 8-6, Table 8-7, Table 8-8 and Table 8-9.

TABLE 8-6. JUGIONG OPERATIONAL MONITORING PROGRAM

Parameter	Raw	Post dose	Clarified	Filtered	Final	Reticulation	Reservoirs	Secondary disinfection
River level	online (level sensor)							
Turbidity	Daily/ online		Daily	Daily/ online		Weekly	Monthly	
Fluoride	Daily				Daily	Weekly		
Colour (HU)	Daily		Daily		Daily			

Parameter	Raw	Post dose	Clarified	Filtered	Final	Reticulation	Reservoirs	Secondary disinfection
pH	Daily	Daily	Daily/ online		Daily	Weekly	Monthly	
Alkalinity	Daily				Daily			
Hardness	Daily				Daily			
Temperature	Daily				Daily			
Chlorine residual					Daily/ online	3 x weekly	1-2 x weekly	online
Total Chlorine					Daily		Monthly	
Structural integrity/ contamination							Monthly	

TABLE 8-7. OURA OPERATIONAL MONITORING PROGRAM

Parameter	Raw	Final	Supply	Reservoirs	Secondary disinfection	
					Wyalong PS	Reefton PS
Suspended solids	Daily					
Fluoride	Fluoride	Daily				
Turbidity		Daily				
pH	Twice weekly					
Chlorine residual		Continuous online	Monthly		Continuous online	Continuous online
Pesticides	Annual					
Structural integrity/contamination	Daily			Monthly		

TABLE 8-8. MT ARTHUR OPERATIONAL MONITORING PROGRAM

Parameter	Raw: Mt Arthur Borefield	Final	Reservoirs	Reticulation
Chlorine residual		3xweekly		3xweekly
Iron	Monthly			
Manganese	Monthly			
Pesticides	Annual			
Structural integrity/contamination	Weekly		Monthly	

TABLE 8-9. MT DAYLIGHT OPERATIONAL MONITORING PROGRAM

Parameter	Raw: Mt Daylight Borefield	Final (reservoir inlet)	Reservoirs	Reticulation
Chlorine residual	Daily	Continuous online/Monthly		Weekly
Pesticides	Monthly	Monthly		
Structural integrity/contamination			Monthly	

*Note: Also recorded on microbiology labels sent to labs as part of the NSW Health Drinking Water Monitoring Program

8.4.3 Corrective Action

- Establish and document procedures for corrective action to control excursions in operational parameters.
- Establish rapid communication systems to deal with unexpected events.

As part of the development of the drinking water management system and risk assessment process, key operating procedures and corrective actions were established for each Critical Control Point (CCP) within the Jugiong, Oura, Mt Arthur and Mt Daylight drinking water supply systems. These included target levels and corrective actions in the event that the alert levels or critical limits are reached. Critical control points are included in appendix B.

8.4.4 Equipment capability and maintenance

- Ensure that equipment performs adequately and provides sufficient flexibility and process control.
- Establish a program for regular inspection and maintenance of all equipment, including monitoring equipment.

Goldenfields Water's objective is to ensure all assets owned or operated by Goldenfields Water are managed responsibly, in compliance with regulatory requirements (GWCC, 2012a). To ensure all assets are able to meet the required levels of service on a long-term basis, Goldenfields Water has prepared an Asset Management Plan (AMP) (GWCC, 2012a). The AMP guides Goldenfields Water on capital and operating expenditure. The Goldenfields Water AMP aims to measure performance through the following (GWCC, 2012a):

Quality - water supply assets will be maintained in a condition that is fit for purpose and provides an acceptable level of redundancy

Function - maintain an appropriate water supply network in partnership with other levels of government and stakeholders, to meet the current and future water needs of the community. Goldenfields Water aims to ensure that assets are able to meet and comply with:

- ADWG
- Pressure and flow requirements
- Water demand requirements

Safety - regularly monitor and inspect various components of the water supply network and prioritise and repair defects in accordance with an overall inspection schedule

To achieve the objectives, routine maintenance, replacement / renewal and improved level of service plans have been developed to guide Goldenfields Water on their capital and operational expenditure.

Capital expenditure

Replacement of assets aims to restore existing assets to original levels of service. When an asset reaches the end of its effective working life it is scheduled to be replaced in the future works program. Modelling of the distribution and reticulation systems aids Goldenfields Water in determining the priority of projects in the future works program as well as identifying which assets require upgrade (GWCC, 2012a).

Asset creation, acquisition and upgrade projects are works that create a new asset or expand an asset's existing capabilities. Assets that require improvement in levels of service may be a result of growth, social or environmental needs and are identified through various sources such as network modelling, Councillor requests, community requests or strategic business plans (GWCC, 2012a)

Operational expenditure

Routine maintenance includes unplanned (reactive), planned (pro-active) and recurring (cyclic) maintenance procedures. Goldenfields Water aims to perform planned and recurring maintenance in order to prolong the life of assets and prevent the occurrence of unplanned maintenance, which can be costlier.

Goldenfields Water has a maintenance management system where excel spreadsheets are used to record works such as inspections, flushing, cleaning of reservoirs, etc. According to the AMP, maintenance expenditure levels are considered adequate to meet required levels of service. Routine maintenance is performed by Goldenfields Water staff (GWCC, 2012a).

8.4.5 Materials and Chemicals

- Ensure that only approved materials and chemicals are used.
- Establish documented procedures for evaluating chemicals, materials and suppliers.

Goldenfields Water conforms to the WSAA Codes and its Procurement Policy for purchasing of materials and chemicals.

The use, including transport and storage, of chemicals listed as "Dangerous Goods" under the Work Health and Safety Regulation 2012 (NSW), including chlorine and fluoride, is dictated by the provisions of the Work, Health and Safety Regulation and Work Cover. Storages and trucks are licensed according to the Work, Health and Safety Regulation.

The NSW Guidelines for Drinking Water Management Systems (NSW Health and NSW Office of Water, 2013) recommends that all chemical deliveries are attended by a trained water treatment plant operator, and that the following procedures are followed:

A certificate of analysis is provided by the supplier at the time of delivery for each batch of chemical supplied and that the chemical satisfies the criteria specified in Chapter 8 of the ADWG, prior to the commencement of unloading

The operator is to check and confirm the correct chemical is being delivered into the appropriate storage

If relevant, the operator is to check that the correct concentration has been supplied

Safety Data Sheets (SDS) and appropriate chemical signs are displayed in a SDS register within the vicinity of chemical storage areas. Chemicals used in the supply of drinking water in the drinking water supply systems managed by Goldenfields Water are listed Table 8-10.

TABLE 8-10. CHEMICALS USED IN GWCC DRINKING WATER SUPPLY SYSTEMS

Chemical	Purpose	Dosing Concentration	Storage
Jugiong Drinking Water Supply System			
Chlorine gas	Disinfection	1.8 mg/L	2 x 920 kg gas tanks in chlorine dosing rooms Supplied by Orica
	Secondary disinfection	0.8 mg/L	2 x 70 kg gas tanks in chlorine dosing rooms Supplied by Orica
Soda Ash	pH adjustment	Varied	35 tonne storage container Supplied by Redox
Aluminium Sulphate	Flocculation	Varied	2 x 36 kL storage tanks in a bunded area Supplied by Nowra Chemicals
Polymer	Coagulation	Varied	50 L storage tank in bunded area 10 x 25 kg bags Supplied by Aquapac
Sodium silicofluoride	Fluoridation	1.0 mg/L	96 x 25 kg bags stored in fluoride dosing room Supplied by Consolidated Chemicals
Oura Drinking Water Supply System			
Chlorine gas	Disinfection	0.6 mg/L	2 x 70 kg gas tanks in chlorine dosing rooms Supplied by Orica
	Secondary disinfection	0.8 mg/L	
Sodium silicofluoride	Fluoridation	1.0 mg/L	48 x 25 kg bags stored in fluoride dosing room Supplied by Consolidated Chemicals
Mt Arthur Drinking Water Supply System			
Chlorine gas	Disinfection	0.8 mg/L	2 x 70 kg gas tanks in chlorine dosing rooms Supplied by Orica
Mt Daylight Drinking Water Supply System			
Chlorine gas	Disinfection	1.0 mg/L	2 x 70 kg gas tanks in chlorine dosing rooms Supplied by Orica

***Source**: HydroScience, 2015*

8.5 Element 5: Verification of drinking water quality

8.5.1 Drinking water quality monitoring

- Determine the characteristics to be monitored in the distribution system and in water as supplied to the consumer.
- Establish and document a sampling plan for each characteristic, including the location and frequency of sampling.
- Ensure monitoring data is representative and reliable.

The verification of drinking water quality supplied to the consumer assesses the overall performance of the system. Verification provides an important link back to the operation of the water supply system and additional assurance that the preventive measures and treatment barriers have worked and are supplying safe quality water.

Verification of the drinking water supply systems managed by Goldenfields Water is also undertaken through the NSW Drinking Water Monitoring Program. The Program monitors water quality at the point of supply to provide ongoing, independent verification of the treatment barriers. Frequency of sampling is based on population.

The Water Quality Officer is responsible for the collection of samples for the NSW Health Drinking Water Monitoring Program. The samples are submitted in accordance with the "Guide for Submitting Water Samples to FASS for Analysis" (Sydney West Area Health Service, 2010) and Goldenfields Water's formal sampling procedure for all routine sampling and analysis. In accordance with the "Guide for Submitting Water Samples to FASS for Analysis", the Water Quality Officer must ensure that all field parameters (pH, turbidity, fluoride, free and total chlorine) are tested and recorded on the sampling labels prior to submission to the labs for analysis.

The NSW Health Drinking Water Monitoring Program assesses 36 parameters for microbial, physical and chemical properties of the water. The results can be accessed at www.drinkingwaterdb.nsw.gov.au.

- Microbial
  - *E. coli*
  - Total coliform
- Physical
  - pH
  - True Colour
  - Turbidity
  - Total Dissolved Solids (TDS)
  - Total Hardness as CaCO3
- Chemicals
  - Aluminium
  - Antimony
  - Arsenic
  - Barium
  - Boron
  - Cadmium
  - Calcium
  - Chlorine
  - Chromium
  - Copper
  - Cyanide
  - Fluoride
  - Iodine
  - Iron

- Lead
- Magnesium
- Manganese
- Mercury
- Molybdenum
- Nickel
- Nitrate
- Nitrite
- Selenium
- Silver
- Sodium
- Sulphate
- Zink

TABLE 8-11. VERIFICATION MONITORING PROGRAM

	Jugiong	Oura	Mt Arthur	Mt Daylight
Microbial	Monthly	Monthly	Monthly	Monthly
Physical	6 Monthly	Monthly	6 Monthly	6 Monthly
Chemical	6 Monthly	Monthly	6 Monthly	6 Monthly

***Source**: HydroScience, 2015*

TABLE 8-12. JUGIONG DRINKING WATER SUPPLY SYSTEM SAMPLING LOCATIONS

Area	Number	Street Location
Cootamundra	106	Cowangs Reservoir inlet, Cootamundra
	108	Gundagai Road, Cootamundra
	109	12-16 Bradman Street, Cootamundra
	114	Dirnaserr Road, Cootamundra
	115	Dirnasser Reservoir outlet, Cootamundra
	334	Bauloora Reservoirs outlet, Cootamundra
	335	Bauloora Reservoirs inlet, Cootamundra
Springdale	116	Springdale Park, Springdale
	216	Town offtake, Springdale
Stockinbingal	111	Stockinbingal Bowling Club, Stockinbingal
	311	Stockinbingal Hotel, Stockinbingal
Wallendbeen	110	Wallendbeen Hotel, Wallendbeen
	210	Service Station, Wallendbeen
	310	Wallendbeen School, Wallendbeen

***Source**: HydroScience, 2015*

TABLE 8-13. OURA DRINKING WATER SUPPLY SYSTEM SAMPLING LOCATIONS

Area	Number	Street Location
Ardlethan	205	Ardlethan Reservoir outlet, Ardlethan
	206	Parks Street, Ardlethan
	336	Palace Hotel, Ardlethan
	346	Bygoo Street, Ardlethan
Ariah Park	201	Tara P.S. discharge, Ariah Park
	202	Ariah Park Reservoir outlet, Ariah Park
	203	Wellmans Street, Ariah Park
	333	Central School, Ariah Park
	343	Golf Club, Ariah Park

Area	Number	Street Location
Barellan	207	Barellan Reservoir outlet, Barellan
Barmedman	401	Barmedman Reservoir outlet, Barmedman
	402	Loftus Street, Barmedman
	442	Barmedman Hotel, Barmedman
	452	Public School, Barmedman
Beckom	204	Beckom Hotel, Beckom
Bethungra	221	01 Amos Street, Bethungra
	318	Bethungra Police Station, Bethungra
	358	Bethungra Service Station, Bethungra
	368	Memorial Park, Bethungra
Eurongilly	319	Eurongilly Reservoir outlet, Eurongilly
Illabo	317	Illabo Hotel, Illabo
Junee	310	Old Junee, Junee
	311	Junee B.T. inlet, Junee
	312	Junee B.T. outlet, Junee
	313	Junee Public School, Junee
	314	Junee High School, Junee
	315	Prince Street, Junee
	316	Marinna P.S. discharge, Junee
Marrar	308	Cnr Don and Wood Street, Marrar
	309	Marrar Pinnacle Reservoir outlet, Marrar
	338	Public School, Marrar
	348	Royal Hotel, Marrar
Temora	301	Temora Balance Tank inlet, Temora
	302	Temora H.L. Reservoir outlet, Temora
	303	Temora High School, Temora
	304	Beattie Street, Temora
	305	Temora West School, Temora
	306	Temora Caravan Park, Temora
	307	Cartwright's Hill Reservoir outlet, Temora
	999	Not Defined, Temora
Ungarie	409	Urgarie Town Reservoir inlet, Urgarie
	410	Bing Wallder Park Urgarie, Urgarie
	440	Urgarie Motel, Urgarie
	450	Central School, Urgarie
Wantabadgery	320	Wantabadgery Shop, Wantabadgery
West Wyalong	405	Perserverance Street, West Wyalong
	406	West Wyalong Public School, West Wyalong
	407	West Wyalong T.S. outlet, West Wyalong
Wyalong	403	Wyalong P.S. meter pit, Wyalong
	404	Wyalong School, Wyalong
	408	Calleen B.T. outlet Wyalong

***Source**: HydroScience, 2015*

TABLE 8-14. MT ARTHUR DRINKING WATER SUPPLY SYSTEM SAMPLING LOCATIONS

Area	Number	Street Location
Collamon	212	Coolamon Hospital, Coolamon
	213	Central School, Coolamon
	214	Coolamon H.L. Reservoir outlet, Coolamon

Area	Number	Street Location
	215	Wagga Road, Coolamon
	999	Not Defined, Coolamon
Ganmain	210	Ganmain H.L. Reservoir outlet, Ganmain
	211	Hay Industry Display Centre, Ganmain
	331	Pre School, Ganmain
	332	Langham Street, Ganmain
Grong Grong	208	Public School, Grong Grong
	338	Grong Grong Park, Grong Grong
Matong	209	Public School, Matong
	309	NA Grong Grong Road, Grong Grong

***Source**: HydroScience, 2015*

TABLE 8-15. MT DAYLIGHT DRINKING WATER SUPPLY SYSTEM SAMPLING LOCATIONS

Area	Number	Street Location
Naradhan	411	Hanna P.S. discharge, Naradhan
	412	Naradhan Reservoir outlet, Naradhan
	413	North Weethalle Reservoirs outlet, Naradhan
Tallimba	416	Tallimba Park, Tallimba
	426	Tallimba School, Tallimba
	436	Tallimba Inn, Tallimba
	999	Not Defined, Tallimba
Weethalle	414	Railway Street, Weethalle
	415	Narriah Reservoirs outlet, Weethalle
	424	Weethalle School, Weethalle
	434	Pioneer Park, Weethalle

8.5.2 Consumer satisfaction

- Establish a consumer complaint and response program, including appropriate training of employees

Phone numbers (general and emergency) are displayed on GWCC website. Reception passes on complaints received to the duty officer. The duty officer circulates daily report of all out of hours' calls. During office hours, customer service takes the call and logs details of the complaint within the system. For both standard and out of hours calls an end of week report is generated that details exceptions, complaints and notifications. Annual data is kept by the Corporate section and undertakes annual benchmark reporting. Levels of service is included in the asset management plan

Table 8-16 Shows Goldenfields Water's current target levels of service.

TABLE 8-16. GWCC TARGET LEVELS OF SERVICE

Key Performance Measure	Level of Service
Pressure and flow – reticulated connections	12 - 90 m head per standard 20 mm connection
Pressure and flow – non-reticulated connections	Equivalent to reticulated connections as a target but may not be achieved in all circumstances. It is a condition of supply that new connections have an onsite 10,000 Litres

Key Performance Measure	Level of Service
	minimum size storage tank. Retrospective fitting to existing connections to be implemented over time
Water quantity	Annual demand: 294 kL/ET Peak day demand 4 kL/ET/d
Notice of planned interruption (written notice)	Domestic and rural – minimum 24 hours Commercial/industrial – 3 working days
Unplanned interruption – reticulated connections	Maximum 2 times/yr if lasting up to 12 hours Maximum 5 times/yr if lasting up to 5 hours
Unplanned interruptions – non reticulated connections	May experience interruptions without prior notice
Service provision	All urban areas of towns and villages within the GWCC area of responsibility. It will also be available to non-urban areas where adequate supply lines already exist or can be laid at a practical and economically recoverable cost
Water quality	Potable water should meet ADWG. Non-potable water is not supplied for human consumption
Response time to complaints	Written: 10 working days Phone: 24 hours
Complaints	Less than 2 complaints per 1,000 properties
Response to supply failures	Priority 1 – 15 min (supply to a large number of customers at a critical time) Priority 2 – 30 min (supply to a small number of customers at a non-critical time Priority 3 – same day (supply to a single customer) Priority 4 – within 1 week (minor problem or complaint) Immediate – in case of emergency or catastrophe
Response to inquiries	Respond to 95% of written inquiries within 10 working days Respond to 95% of personal inquiries within 2 working days
Ongoing water conservation measures	Implement a regional demand management strategy

***Source**: GWCC, 2012a*

8.5.3 Short term evaluation of results

- Establish procedures for the daily review of drinking water quality monitoring data and consumer satisfaction.
- Develop reporting mechanisms internally, and externally, where required.

Goldenfields Water evaluates water quality data on receipt of monitoring results. Water quality results from the NSW Health Drinking Water Monitoring Program are reported to the Production &

Services Manager, General Manager and the Manager Distribution and Construction when the Production & Services Manager or General Manager are not available.

8.5.4 Corrective action

- Establish and document procedures for corrective action in response to non-conformance or consumer feedback.
- Establish rapid communication systems to deal with unexpected events.

Any exceedances are recorded and acted upon immediately with the appropriate regulatory authorities notified. All test results are recorded in the NSW Health Drinking Water Database which is completely independent of Goldenfields Water. The NSW Health Drinking Water Monitoring Program provides the following response protocols:
NSW Health Response Protocol: for the management of microbiological quality of drinking water (November 2011)
NSW Health Response Protocol: for the management of physical and chemical quality (January 2004)
NSW Code of Practice for Fluoridation of Public Water Supplies (2011) and Fluoride Overdose Response

8.6 Element 6: Management of incidents and emergencies

8.6.1 Communication

- Define communication protocols with the involvement of relevant agencies and prepare a contact list of key people, agencies and businesses.
- Develop a public and media communications strategy

In the event of an emergency, communication internally within Goldenfields Water and externally with stakeholders and emergency service providers is integral to the incident response and recovery process. An emergency contact list is displayed in the Goldenfields Water offices. The emergency contact list is reviewed and updated as required.

If the community is required to be alerted, Goldenfields Water follows the procedure outlined in the Goldenfields Water County Council Emergency Response Management Plan.

Stakeholder contact details are listed in the Critical Control Point documents.

Communication for water quality incidents are found in the NSW Health Drinking Water Monitoring Program. Council will follow the NSW Health protocols, available from <http://www.health.nsw.gov.au/environment/water/Pages/drinking-water.aspx>, should a water quality incident occur. These protocols relate to:

Physical and chemical quality;
Treatment failure, *Cryptosporidium* and *Giardia*; and
Microbiological quality.

Action: Develop templates for communicating water quality incidents to the public, e.g. media releases, letters, website content.

8.6.2 Incident and emergency response protocols

- Define potential incidents and emergencies and document procedures and response plans with the involvement of relevant agencies
- Train employees and regularly test emergency response plans
- Investigate any incidents or emergencies and revise protocols as necessary

In the event of a water quality incident, Goldenfields Water responds according to the protocols and procedures in Table 8-17.

TABLE 8-17 LIST OF GWCC WATER QUALITY INCIDENT RESPONSE PROTOCOLS

Response Protocol	Notes
Goldenfields Water County Council Emergency Response Management Plan	In the event of any emergency, the operator is to report to their Supervisor, who informs the Manager Production & Services, who informs the General Manager. The General Manager authorises the response actions.
Goldenfields Water County Council Pollution Incident Response Management Plan (GWCC, 2012b)	Defines an incident as extreme, medium or low, where: • Extreme: imminent/Serious danger to onsite personal and surrounding township. Immediate action required. Implement emergency evacuation procedure and notification procedure per Pollution Incident Response Management Plan • Medium: Moderate danger. Action as soon as possible. Implement controls i.e spill containment. Notify supervisor • Low: Minor to negligible danger. Assess if further action is required. Monitor controls so the hazard is maintained as 'low' if hazard cannot be eliminated completely. Notify supervisor
NSW Health Response Protocol: for the management of microbiological quality of drinking water (25 Nov 2011)	*E. coli* detections require immediate resampling as stipulated in the NSW Health response protocol. Council should immediately discuss any *E. coli* detections with NSW Health to determine appropriate public health response, including the need to issue a boil water alert. This protocol also includes actions in response to failure of treatment, disinfection or poor or rapidly changing source water quality.
NSW Health Response Protocol: for the management of physical and chemical quality (01 Jan 2004)	For physical and chemical exceedances, Council follows the NSW Health Response Protocol, with resampling and risk assessments carried out with Council and NSW Health as required.
NSW Code of Practice for Fluoridation of Public Water Supplies (2011)	Details operator training and qualification requirements as well as normal and incident reporting procedures. Provides an incident management procedure for adoption.

8.7 Element 7: Employee awareness and training

8.7.1 Employee awareness and involvement

- Develop mechanisms and communication procedures to increase employees awareness of and participation in drinking water quality management

Goldenfields Water aims to provide an environment of equal opportunity in its workplace and is committed to the development of skilled, knowledgeable and dedicated staff. Staff training is an important and essential element of corporate development and Goldenfields Water supports this through on-going on and off-the-job training for all employees.

8.7.2 Employee training

- Ensure that employees, including contractors, maintain the appropriate experience and qualifications
- Identify training needs and ensure resources are available to support training programs
- Document training and maintain records of all employee training

Human resources maintain a spreadsheet register of training and employee qualifications. Human resources are responsible for learning and development of employees.

Specialist training and certification, including fluoridation and chemical dosing is regularly refreshed, as required. Training requirements are identified each year through the annual skills assessment and performance review of each employee by their direct supervisor. Training requirements for each employee are then factored into Council's budget for the proceeding financial year.

Goldenfields Water also has in place a Workforce Management Plan that sets out the path for development of Goldenfields Water human resources (GWCC, 2012c). In addition to the training described above, employees are also trained in:

- Backflow prevention
- Basic risk management
- Asset condition rating
- Customer relations and customer service
- GIS training (office and field staff)
- Procurement (financial officer and supervisors)
- Media presentation (key staff)

8.8 Element 8: Community involvement and awareness

8.8.1 Community consultation

- Assess requirements for effective community involvement.
- Develop a comprehensive strategy for community consultation.

GWCC encourages community involvement and consultation through the following initiatives Goldenfields Water County Council Ordinary Meetings. Ordinary meetings of Goldenfields Water County Council are open to the public and are normally held at 1 pm on the fourth Thursday of every second month. The meetings are held in the Goldenfields Water County Council offices in Temora,

NSW. The meeting schedules, agendas and minutes can be found on the Goldenfields Water website and in the Temora office the Thursday prior to the ordinary meeting. Members of the public can address Council during ordinary council meetings, however, written notification to the General Manager is required by the Monday prior to the meeting.

8.8.2 Communication

- Develop an active two-way communication program to inform consumers and promote awareness of drinking water quality issues.

The Goldenfields Water County Council website has detailed information regarding their drinking water supply systems under the “About Us” and “Our Infrastructure” section. The water supply services section provides details on the drinking water supply systems’:

- Source water
- Treatment systems
- Distribution systems

8.9 Element 9: Research and development

8.9.1 Investigative studies and research monitoring

- Establish programs to increase understanding of the water supply system.
- Use information to improve management of the water supply system.

Continual improvement is necessary to ensure that Goldenfields Water can ensure the delivery of safe drinking water to the community into the future. The following items have been identified as investigative research projects for Goldenfields Water to improve the effectiveness and efficiency of the barriers protecting the community against waterborne pathogens.

Identified areas of investigation are included in the improvement and action plan, included in appendix C.

8.9.2 Validation of processes

- Validate processes and procedures to ensure that they are effective at controlling hazards.
- Revalidate processes periodically or when variations in conditions occur.

Validation requires the evaluation of system processes and equipment to prove the performance under all conditions expected to be encountered during operations. Validation should be undertaken on new processes and equipment, when upgrades occur and on a regular basis to ensure continual performance.

Validation should be undertaken when there is a:

- Change in raw water quality
- Modification to the water treatment processes
- Change to the delivery, storage and distribution systems of treated and untreated water
- Change in the use of treated water
- Change in water quality standards
- New research or understanding of water quality issues

- Receipt of information that indicates a health risk associated with the quality of the drinking water

Validation of new or upgraded processes and equipment is undertaken by qualified, experienced engineers and operators through:

- System design according to industry guidelines and standards
- Individual process and equipment specification against CCP target limits
- Procurement of equipment/chemicals from approved suppliers
- Market pre-validation by suppliers, particularly associated with water treatment chemicals

Ongoing validation processes to ensure safe and acceptable drinking water is supplied to the customer are:

- Review of scientific literature on treatment processes and industry best practice
- Evaluation of the effectiveness of CCPs in eliminating or controlling risks
- Assessment of research and development work to ensure CCP limits remain appropriate

8.9.3 Design of equipment

- Validate the selection and design of new equipment and infrastructure to ensure continuing reliability.

Primary Disinfection Contact Time

In treated water, a combined available residual chlorine level of 0.5 mg/L after a contact time of 30 minutes is considered sufficient to ensure microbial control, given a clean distribution system and no significant recontamination. C.t is a measure of free chlorine residual concentration (C) and contact time (t). A primary disinfection contact time greater than 15 mg. min/L is required to be consistent with ADWG requirements of 30 mins contact time at 0.5 mg/L. Table 8-18 shows the calculated C.t. for each system.

The four drinking water supplies operated by Goldenfields Council have adequate chlorine contact time for microbial removal. Based on the information provided, the C.t for each drinking water supply is documented in Table 8-18.

TABLE 8-18. CHLORINE CONTACT TIME TO FIRST CUSTOMERS

Drinking Water Supply System	Primary Chlorinator	Comments	C.t. (mg. min/L)
Jugiong	Jugiong WTP chlorinator	Total C.t. is achieved at the clear water tank (2973 kL) at the Jugiong WTP.	20.4
Oura	Oura chlorinator	Total C.t. has been calculated using the Oura collection tank (2279 kL) at the Oura WTP as well as the 450 m pipe distance to the first connection.	21.8
Mt Arthur	Mt Arthur chlorinator	Total Ct is achieved at the three collection tanks (1454 kL each) at Mt Arthur WTP.	41.9
Mt Daylight	Mt Daylight chlorinator	Total Ct is achieved at the four collection tanks (239 kL each) at Mt Daylight WTP.	56.7

***Source**: HydroScience, 2015*

Action: Chlorine calculations to be rechecked for minimum operating levels.

8.10 Element 10: Documentation and record keeping

8.10.1 Management of documentation and records

- Document information pertinent to all aspects of drinking water quality management.
- Develop a document control system to ensure current versions are in use.
- Establish a records management system and ensure that employees are trained to fill out records.
- Periodically review documentation and revise as necessary.

The DWMS documents information pertinent to all aspects of drinking water quality management for the Jugiong, Oura, Mt Arthur and Mt Daylight drinking water supply systems. The DWMS is a living document and should be maintained in-line with actual operations and management. Any changes to the drinking water supply systems should be updated and documented within this DWMS.

Goldenfields Water has in place a policy for record management to effectively record, manage and enable access to information stored in both physical and electronic formats in accordance with statutory requirements.

8.10.2 Reporting

- Establish procedures for effective internal and external reporting.
- Produce an annual report to be made available to consumers, regulatory authorities and stakeholders.

Goldenfields Water undertakes reporting as required by NSW Health and DPI Water. In line with Council's responsibilities the following reports are produced:

- Council Annual Report: it is recommended by NSW Health that references to drinking water quality and the DWMS should be made in Council's Annual Report. The Annual Report is available electronically on Council's website and in Goldenfields Water's head office in Temora
- NSW Health compliance reporting for drinking water quality monitoring: drinking water quality within Goldenfields Water is monitored and the results are recorded in the NSW Health Drinking Water Database. Water quality reports can be produced from the database, which is located at the following web page: http://www.drinkingwaterdb.nsw.gov.au
- Water Supply and Sewerage NSW Performance Reporting: Council's water supply service performance is detailed in the NSW Water Supply and Sewerage Performance Monitoring Report annually. This report is available for public access from the DPI Water
- Goldenfields Water County Council Business Activity Strategic Business Plan
- Drinking water management system annual report to be provided to NSW Health

8.11 Element 11: Evaluation and audit

8.11.1 Long term evaluation of results

- Collect and evaluate long-term data to assess performance and identify problems.
- Document and report results.

Water quality results for the Jugiong, Oura, Mt Arthur and Mt Daylight drinking water supply systems are measured at the sample points listed in section 6.4 and 6.5. The sample points are measured by a mix of manual testing and online instruments, with results recorded both in log books and electronically.

8.11.2 Audit of drinking water quality management

- Establish processes for internal and external audits.
- Document and communicate audit results.

An external Gap Analysis of GWCC water supply system was undertaken on 23 November 2016 by Atom Consulting. The results of the Gap Analysis were used to facilitate review of the Drinking Water Management System.

External inspections of the system are regularly carried out by Department of Primary Industries Water (DPI Water) inspectors. Council engineers are not notified of these inspections in advance. Water quality results are reviewed by the WTP Operator and DPI Water inspector. Reports of findings are provided by the inspectors.

External auditing of data submitted for the New South Wales Office of Water annual performance reporting (including the NWI indicators) is undertaken every three years. The external auditor is approved by DPI Water.

Internal audits of the Critical Control Points, critical limit monitoring instruments and the Drinking Water Management System are undertaken in accordance with the internal audit schedule.

The drinking water management system will be internally audited by the Water Quality Officer. The review will assess Goldenfields Water's performance in relation to:

- CCPs and their exceedances
- Improvement Plan
- Record keeping
- NSW Health Database performance

Action: Develop internal audit schedule

8.12 Element 12: Review and continual improvement

8.12.1 Review by senior executive

- Senior executive review of the effectiveness of the management system.
- Evaluate the need for change.

The Drinking Water Management System and its implementation will be reviewed regularly (at least annually) to ensure that it maintains currency with the water supply operation and management. Where possible, the PHU and DPI regional officers will be included in the review process.

As part of the requirements of Goldenfields Water's reporting procedures, the Executive Manager Distribution and Construction will review the effectiveness of the management system and the underlying policies. This review will be undertaken annually and will focus on reviewing the effectiveness and implementation of the DWMS.

8.12.2 Drinking water quality management improvement plans

- Develop a drinking water quality management improvement plan.
- Ensure that the plan is communicated and implemented, and that improvements are monitored for effectiveness.

An action and improvement plan is included in appendix C. The Executive Manager Distribution and Construction is responsible for the Improvement Plan. Individual actions are assigned to the appropriate officers. Priorities have been determined based on the risks as identified through the workshop process. The Improvement Plan is used by Goldenfields Water to monitor the implementation of the drinking water management system. The Improvement Plan is subject to an annual review by the General Manager.

9 REFERENCES

ANZECC, Conservation Council and ARMCA&NZ (2000) *Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Volume 1*, *The Guidelines*. Australian and New Zealand Environment and Conservation Council, Agriculture and Resource Management Council of Australia and New Zealand, Sydney

Australian Building Codes Board (ABCB) (2013) *The Plumbing Code of Australia*

Goldenfields Water County Council (GWCC) (2014) *Goldenfields Water County Council Overview March 2014*

Goldenfields Water County Council (GWCC) (2012a) Goldenfields Water County Council Asset Management Plan

Goldenfields Water County Council (GWCC) (2012b) Goldenfields Water County Council Pollution Incident Response Management Plan Jugiong Water Treatment Plant EPA Licence No. 1723

Goldenfields Water County Council (GWCC) (2012c) Goldenfields Water County Council Workforce Management Plan 2012/16

National Resources Commission (2006) *Scientific Review Lower Lachlan Groundwater Sharing Plan - November 2006*

NATSPEC (year unknown) *AUS-SPEC 0071 Water Supply – Reticulation and pump stations (Design)*, NATSPEC, Sydney

NHMRC, NRMMC (2011) *Australian Drinking Water Guidelines Paper 6 National Water Quality Management Strategy*. National Health and Medical Research Council, National Resource Management Ministerial Council, Commonwealth of Australia, Canberra

NSW Department of Health (01 January 2004) *NSW Health Response Protocol: for the management of physical and chemical quality* [http://www0.health.nsw.gov.au/resources/publichealth/environment/water/nswhrp_chemical_pdf.asp (accessed 20 March 2013)]

NSW Department of Health (01 July 2008) *NSW Health Response Protocol: following failure in water treatment or detection of giardia or cryptosporidium in drinking water* [http://www0.health.nsw.gov.au/publichealth/environment/water/response.asp (accessed 20 March 2013)]

NSW Department of Health (2011) *New South Wales Code of Practice for Fluoridation of Public Water Supplies*. Gladesville, NSW Department of Health

NSW Department of Health (25 November 2011) *NSW Health Response Protocol: for the management of microbiological quality of drinking water (Version 2)* [http://www0.health.nsw.gov.au/resources/publichealth/environment/water/response_protocol_micro_q_pdf.asp (accessed 20 March 2013)]

NSW Office of Water (DPI Water) (2014) *Circular No. LWU 18 Assuring the safety of drinking water supplies*

NSW Office of Water (DPI Water) (2011a) *Water Resources and Management Overview - Murrumbidgee Catchment*

NSW Office of Water (DPI Water) (2011b) *Water Resources and Management Overview - Lachlan Catchment*

Sydney West Area Health Service (2010) *Guide for Submitting Water Samples to the Division of Analytical Laboratories for Analysis*. Sydney West Area Health Service, Lidcombe

10 APPENDIX A RISK ASSESSMENT

Goldenfields Water

Drinking Water Management System

10.1 Technical Note 2 - Risk Assessment and Critical Control Point Workshop

Prepared for Goldenfields Water County Council by:

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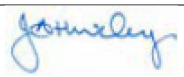
3	MTR	JHU	Jessica Huxley		October 2015

10.2 Risk Assessment and Critical Control Point Workshop Introduction

Goldenfields Water County Council hosted a five day site visit and risk assessment workshop which included participants from HydroScience Consulting, NSW Health Water Unit, Local Public Health Unit, and DPI Water (formerly NSW Office of Water), as well as

the bulk water Councils of Cootamundra, Harden and Young Shire Councils. The purpose of the site visit was to get a thorough understanding of the drinking water supply systems operated by Goldenfields Water County Council, hereafter referred to as Goldenfields Water in this technical note. The risk assessment aimed to identify all hazards and develop appropriate controls for the drinking water systems.

Goldenfields Water operates four drinking water supplies: Jugiong, Oura, Mt Arthur and Mt Daylight. Goldenfields Water also operates a non-drinking water supply at Hylands Bridge, which was not assessed as part of this drinking water management system.

The Jugiong drinking water supply is a surface water system that draws raw water from the Murrumbidgee River. Water is treated at the Jugiong Water Treatment Plant (WTP) and the majority of water produced is distributed to bulk customers: Cootamundra, Harden, and Young Shire Councils. The Oura drinking water supply is a groundwater system, drawing water from three bores at the Oura borefield, situated in the Murrumbidgee inland alluvial aquifer. Water from the bores is aerated and disinfected prior to distribution. The Oura system is the largest distribution system managed by Goldenfields Water, spanning from Junee in the south to Ungarie in the north. The Mt Arthur and Mt Daylight drinking water supplies are groundwater systems that draw water from the Lachlan Fold Belt fractured rock aquifer system and the lower Lachlan alluvium, respectively. Raw water from the Mt Arthur and Mt Daylight drinking water supply systems is disinfected prior to distribution. The Mt Arthur system distributes to retail customers in the Coolamon and Grong Grong area, and the Mt Daylight system distributes to the villages and surrounds of Naradhan, Weethalle and Tallimba in Bland Shire Council area.

The site investigation and risk assessment workshop was undertaken on 28 Jul 2014 - 01 Aug 2014. The workshop was held at the Goldenfields Water Council Chambers in Temora. Participants at the workshop included:

Goldenfields Water County Council

1. Andrew Grant - General Manager (Wednesday and Thursday)
2. Shane Baldry - Acting Workshop Manager
3. Tony Corby - Water Quality Officer
4. Chris Perry - Manager Distribution and Construction
5. Sean Tiernan - Southern Distribution and Construction Manager (Friday)

Cootamundra Shire Council

1. Gary Arthur - Director Engineering Services (Wednesday)
2. Mark Ellis - Manager Works and Services (Thursday)
3. Chris Imrie - Manager Development Services (Wednesday)
4. Daryl Kelly - Workshop Foreman (Thursday)

Harden Shire Council

1. Mark Crisp - Director Technical Services (Thursday)
2. Jon Hill - Water Supply Supervisor (Thursday)

Young Shire Council

1. Sally Atkinson - Environmental Health Officer (Thursday)
2. Greg Prest - Supervisor Utility Services (Wednesday and Thursday)
3. Guy Rolfe - Utility Services (Wednesday)
4. Abe Sweaney - Utility Services (Thursday)
5. Nicole Vonarx - Director Utility Services (Wednesday and Thursday)

HydroScience Consulting

1. Jessica Huxley – Environmental Manager
2. Andrew Fraser - Planning Manager (Wednesday and Thursday)
3. Maria Tran – Water and Wastewater Engineer

NSW Health

1. Tony Burns - Senior Environmental Health Officer
2. Michelle Phoenix - Project Officer, NSW Health Water Unit

DPI Water

3. Bernie Barnes - Regional Inspector

10.3 Hazard Identification and Risk Assessment

Hazard Identification and Risk Assessment workshops were facilitated by HydroScience to identify key hazardous events and rate the risks associated with Goldenfields Water's drinking water supply systems from source to consumers.

Council used the *Australian Drinking Water Guidelines 2011* (ADWG) (NHMRC, 2011) risk assessment matrix where risks are classified as very high, high, moderate and low. Both maximum and residual risks were assessed within the system.

Maximum risk:	risks that are present without preventative measures and controls
Residual risks:	risks that are present after implementing the system's preventative measures and controls
Preventative measures and controls:	actions, activities and processes used to prevent the identified hazards or reduce them to acceptable levels

The risk assessment matrix adopted by Goldenfields Water and the prioritisation of actions is set out in Table 1. Table 2, Table 3, Table 4, and Table 5 detail the risk assessment results for Jugiong, Oura, Mt Arthur, and Mt Daylight, respectively.

Goldenfields Water

Drinking Water Management System

10.3.1 Table 1 – Risk Assessment Matrix

CONSEQUENCE / LIKELIHOOD	1. Insignificant Insignificant impact, little disruption to normal operation, low increase in normal operation costs	2. Minor Minor impact for small population, some manageable operation disruption, some increase in operating costs	3. Moderate Minor impact for large population, significant modification to normal operation but manageable, operation costs increased, increased monitoring	4. Major Major impact for small population, systems significantly compromised and abnormal operation if at all, high level of monitoring required	5. Catastrophic Major impact for large population, complete failure of systems
1. Rare May occur in exceptional circumstance	Low	Low	Moderate	High	High
2. Unlikely Could occur at some time	Low	Low	Moderate	High	Very High
3. Possible Might occur at some time	Low	Moderate	High	Very High	Very High
4. Likely Will probably occur in most circumstances	Moderate	High	High	Very High	Very High
5. Almost Certain Expected to occur in most circumstances	Moderate	High	Very High	Very High	Very High

Very High Risk: Senior Management to be advised immediately **High Risk:** Senior Management attention needed immediately

Moderate Risk: Issue to be resolved immediately or Senior Management notified **Low Risk:** Responsibility distributed to staff and supervisor immediately

The risk rating of an incident is based on the combination of Consequence and Likelihood.

Consider the Consequence and Likelihood to determine a Risk Rating

Consequence + Likelihood = Risk Rating

Goldenfields Water

Drinking Water Management System

10.3.2 Table 2 – Jugiong Drinking Water Supply System Risk Assessment

Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes / Recommendations
	Likelihood	Consequence	Maximum risk	What control measures are currently in place?	Likelihood	Consequence	Residual Risk		
Catchment - Murrumbidgee River									
Pathogens									
Sewerage or septic overflow into catchment	3	5	Very High	Jugiong WTP processes – (coagulation, flocculation, sedimentation, filtration, disinfection); ability to shut down plant; well-trained operators	1	5	High	▪ 2xWeekly visual inspection of raw water intake ▪ Online raw water turbidity monitoring (on raw water pipeline) ▪ Monthly bacto sampling ▪ SCADA/telemetry	POSSIBLE CAUSES: STP overflows and leaks, On-site Sewerage Management System (OSSMS) in Jugiong township experiencing discharges and failures, tankers carrying sewerage on highway. RECOMMENDATION (REC): GWCC to consider installing an online turbidity meter in Murrumbidgee River to predict water quality decline.
Flooding events, storm water flows, and high river events increasing turbidity in source water	5	5	Very High	Jugiong operator advised by State Water to variation in discharges; Jugiong WTP processes; continuous monitoring of river level (level sensor); operators monitor weather conditions daily; experienced operators; quality tests/ jar testing before extraction of suspect water; auto shut down on rapid turbidity rise; system storage capacity (3- 4 days storage capacity in winter)	1	5	High	▪ 2xWeekly visual inspection of raw water intake ▪ Daily check of weather forecast ▪ Online raw water turbidity monitoring (on raw water pipeline) ▪ Monthly bacto sampling ▪ SCADA/telemetry	POSSIBLE CAUSES: high rainfall events, flooding events, releases from Burrinjuck Dam Murrumbidgee River flow can be accessed at: http://www.waterinfo.nsw.gov.au/drr/murrumbidgee.shtml. Burrinjuck Dam is monitored by State Water Corp (ph: 6227 8121). State Water informs GWCC of any discharges (telephone, email, sms). In 2001, dam was augmented to handle largest possible flood. REC: alternate water supply - Jugiong and Oura systems to be connected for emergency supply REC: GWCC to consider installing an online turbidity meter in Murrumbidgee River to predict water quality decline.

Goldenfields Water

Drinking Water Management System

Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes / Recommendations
Unrestricted livestock and/or wildlife access to water supply catchment	5	5	Very High	Murrumbidgee catchment management - riparian zones, stream fences, stocking rate controls; Jugiong WTP processes; quality tests and jar testing before extraction of suspect water	1	5	High	▪ 2xWeekly visual inspection of raw water intake ▪ Online raw water turbidity monitoring ▪ Monthly bacto sampling ▪ SCADA/telemetry	POSSIBLE CAUSES: dead animals at the intake, etc Murrumbidgee catchment management performed by Riverina Local Land Services REC: GWCC to consider installing an online turbidity meter in Murrumbidgee River to predict water quality decline.
Rapid change in raw water quality	4	5	Very High	Archival records showing past events and actions taken; Jugiong WTP processes; quality tests and jar testing before extraction of suspect water; Jugiong raw water pumps auto shut down on rapid turbidity rise; pH correction in WTP; able to access plant during floods	1	5	High	▪ 2xWeekly visual inspection of raw water intake ▪ Online raw water turbidity monitoring (on raw water pipeline) ▪ Monthly bacto sampling ▪ SCADA/telemetry	POSSIBLE CAUSES: water extracted from different levels of Burrinjuck Dam REC: GWCC to consider changing operator working hours or plant operation hours to ensure that water operator is present at Jugiong WTP for a few hours whilst plant is in operation. REC: GWCC to consider installing an online turbidity meter in Murrumbidgee River to predict water quality decline.
Murrumbidgee River and Burrinjuck Dam									
Turbidity									
Controlled and uncontrolled fires	2	3	Moderate	Jugiong WTP processes; communication with emergency personnel; SCADA; jar testing; GWCC liaises with LEMC or REMC depending on size/area of the fire	1	3	Moderate	▪ SCADA / telemetry	REC: Alternate water source e.g. Oura system to supplement Jugiong supply (in process)

Goldenfields Water

Drinking Water Management System

Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes / Recommendations
Chemicals									
Slow seepage of chemicals into catchment by point source contaminant, including industrial discharges	2	2	Low	Dilution	2	2	Low		POSSIBLE CAUSES: active or closed waste disposal, contaminated waste sites, active or closed petrol stations Currently there are old fuel stations along the river and one operating fuel station (BP)
Chemical spill in catchment	3	2	Moderate	Warnings on Hume Highway with emergency contact numbers; dilution; GWCC contacted in the event of chemical spills; storage capacity in system; extraction management; fast flowing river	2	2	Low		POSSIBLE CAUSES: farm drums, fuel truck spillages on highway or bridges over Jugiong Creek
Farming, forestry practices leading to pesticides and fertilisers in source waters	3	3	High	Annual pesticide analysis; dilution; Young, Harden and Cootamundra Shires have drum musters (all are members of regional waste groups)	1	3	Moderate		Annual pesticide analysis - only detection occurred last year (under guideline values) REC: GWCC to consider partnering with NSW Health to investigate pesticides in raw water
Algal blooms	1	2	Low	Multiple extraction levels at Burriniuck Dam; use of tank storage in periods of poor water quality; extraction management; Jugiong WTP processes; jar testing	1	2	Low		Burriniuck Dam is monitored by State Water Corp (ph: 6227 8121)

Goldenfields Water

Drinking Water Management System

Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes / Recommendations
Jugiong WTP									
Pathogens									
Failure of inlet screen / inlet well	3	5	**Very High**	Screens cleaned weekly	1	5	**High**	▪ 2xWeekly visual inspection of raw water intake ▪ Online raw water turbidity monitoring (on raw water pipeline) ▪ SCADA / telemetry	Possible causes: birds falling in screen, blockages, dead animals, blockages, fish
Failure of coagulation / flocculation	3	5	**Very High**	Jugiong WTP processes; alarms on rapid mixers and flocculators; well-trained operators; operators on-site for chemical delivery; reputable supplier; preventative maintenance; spares onsite	1	5	**High**	▪ Daily visual plant inspection ▪ Monthly bacto sampling ▪ SCADA/telemetry	POSSIBLE CAUSES: inadequate chemical dosing, incorrect chemical dosage, power failure, inadequate mixing, mechanical / electrical failure, pump / mixer failure, running out of chemical, fluctuation in water quality, birds in rapid mixer, human error (valves not shut etc), failure of raw water turbidity meter, low alkalinity in raw water. Past incident: failure of alarms. REC: GWCC to consider changing operator working hours or plant operation hours to ensure that operator is present to observe WTP operations (1hr at least) REC: GWCC to consider adjusting chemical delivery SOP to include specific gravity tests on alum upon delivery to verify chemical REC: GWCC to consider flushing soda ash mains yearly to ensure pre-dosing line is functional
Failure of soda ash dosing (post-dosing)	5	5	**Very High**	Jugiong WTP processes; weekly chemical drop tests; jar tests performed weekly and when there is a change in water quality; chemical verification procedure upon delivery	2	4	**High**	▪ Daily visual plant inspection ▪ SCADA / telemetry ▪ Daily manual pH testing in finished water ▪ Monthly bacto sampling	POSSIBLE CAUSES: electrical / mechanical failure, pipe failure, running out of chemical, incorrect dosing rate, failure of water softening process etc

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Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes / Recommendations
Failure of clarifier	3	5	Very High	Jugiong WTP processes; auto plant shut down on turbidity after filters; de-sludging occurs on timer; alarms on sludge valves and rakes; ability to isolate tanks; cleaning of clarifiers as required	1	5	High	▪ Daily visual plant inspection ▪ SCADA / telemetry ▪ Daily manual testing of pH, turbidity, apparent colour at clarifier outlet ▪ Online turbidity monitoring at common filter outlet ▪ Monthly bacto sampling	POSSIBLE CAUSES: mechanical / electrical failure, sludge scraper failure; rake failure, failure of valves, build-up of sludge, blockages, increased flow rate through plant, boiling in sedimentation tanks, short circuiting of hot/cold water, etc No online turbidity or pH at clarifier outlet REC: GWCC to consider installing online turbidity and pH meters at clarifier outlet REC: GWCC to consider changing operator working hours or plant operation hours to ensure that operator is present to observe WTP operations (1hr at least)
Failure of filtration	4	5	Very High	Jugiong WTP processes; Auto plant shut down on high turbidity post-filter; filter headloss indicators; auto- backwash on headloss and time; established program for draining, cleaning, disinfection of filters; pre-dose chlorine prior to filters if required; operators monitor media and nozzle performance; individual filters can be taken offline	1	5	High	▪ Daily visual plant inspection ▪ SCADA / telemetry ▪ Online turbidity monitoring at common filter outlet ▪ Monthly bacto sampling	POSSIBLE CAUSES: mechanical / electrical failure - blowers, backwash pumps, short filter runs due to early high head loss, problems with backwash, filter breakthrough, loss of media Backwash triggers: headloss (3 m) and time (96 hours) REC: GWCC to consider installing online turbidity meters after individual filters REC: GWCC to consider initiating filter backwash based on turbidity at filter outlet and changing backwash on 72 hours based on advice from DPI Water REC: GWCC to develop SOP for draining, cleaning and disinfecting filters
Failure of disinfection	5	5	Very High	Jugiong WTP processes; Auto plant shut down based on low or high free chlorine; reputable supplier; scales on chlorine tanks; redundancy - duty/standby chlorinators;	1	5	High	▪ Daily visual insp. ▪ SCADA / telemetry ▪ Daily manual free chlorine testing in finished water ▪ 1 - 2 times weekly	POSSIBLE CAUSES: electrical / mechanical failure, pipe failure, running out of chemical, incorrect dosage, failure of injector, blockages, human error, etc Past incident: almost run out of chemicals (suspected that half-full cylinder was supplied) - able to use small 70kg cylinders as backup for 1 day. GWCC has

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Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes / Recommendations
				auto changeover; established maintenance programs; 70kg cylinders available in emergencies; heater in chlorine room; secondary chlorination units; manual dosing of reservoirs with hypo in the event that low chlorine water enters supply; well-trained operators				manual free chlorine testing in reservoirs ▪ Online chlorine analyser in finished water at Jugiong WTP ▪ Monthly bacto sampling ▪ Online chlorine analysers in reticulation: Prunevale PS and Cootamundra Depot	now installed scales on chlorine tanks to monitor usage REC: GWCC to complete live chlorine monitoring system for reticulation system (in progress)
Sabotage or vandalism at Jugiong WTP	2	5	Very High	Locked gates; man-proof fences; operators living next door; signage with GWCC emergency contact numbers	1	5	High	▪ Daily visual plant inspection	
Chemicals									
Overdose of fluoride	3	3	High	Auto plant shut down when fluoride plant fails; chemical verification procedure upon delivery; fluoride plant designed as per *Code of Practice for the Fluoridation of Public Water Supplies*; well-trained operators; flow meter, flow switch, pressure switch on fluoride dosing system; heater in fluoride room; cross-reference different fluoride probes; fluoride probes calibrated daily; preventative	1	3	Moderate	▪ Daily visual plant inspection ▪ SCADA / telemetry ▪ Daily fluoride testing in raw and finished water ▪ 3x weekly manual testing in retic	POSSIBLE CAUSES: flow meter failure, electrical / mechanical failure, poor chemical quality, clumping, blockages, etc Prominent system theoretically unable to overdose. REC: GWCC to consider developing SOP for fluoride hopper cleaning

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Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes / Recommendations
				maintenance; hopper cleaned; fluoride calculations performed daily					
Overdose of chemicals (polymer, alum)	4	2	High	Chemical verification procedure upon delivery; register of dialysis patients that are customers of GWCC and are contactable in event of emergency; well-trainer operators; daily visual inspections; operators present upon chemical delivery	2	2	Low	▪ Daily visual plant inspection ▪ SCADA / telemetry	POSSIBLE CAUSES: mechanical / electrical failure, inconsistent chemical quality / concentration, incorrect dosage, human error, etc
Infrastructure leach components of materials	4	2	High	Tray designed to catch oil spills from rapid mixer and pumps; preventative maintenance	2	2	Low	▪ Daily visual plant inspection ▪ SCADA / telemetry	Infrastructure includes: pipework, lining of valves, pumps, oils POSSIBLE CAUSES: chemical reactions, oil spill from rapid mixer or pump
Disinfection By-Products									
Failure of chlorine pre-dosing	3	3	High	Jugiong WTP processes; chemical verification procedure upon delivery; cross-check online chlorine analysers with hand-held analyser; heater in chlorine room; scales on chlorine cylinder; auto plant shut down on high and low chlorine in finished water	1	3	Moderate	▪ Daily visual plant inspection ▪ SCADA / telemetry ▪ Online chlorine analyser in finished water at Jugiong WTP	POSSIBLE CAUSES: electrical / mechanical failure, pipe failure, running out of chemical, blockages, human error, etc Chlorine pre-dosing is optional and is available to dose prior to coagulation and prior to filters. Pre- dosing initiated for the removal of colour. Pre-dose chlorine needs to be turned on manually REC: GWCC to liaise with NSW Health to conduct a study on disinfection by-products
Loss of supply									
Power failure	3	2	Moderate	Breakdown procedures in place (Jugiong manuals); plant can be run manually; can access generator if necessary	3	2	Moderate	▪ Daily visual plant inspection ▪ SCADA / telemetry	

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Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes / Recommendations
All of System									
Pathogens									
Loss of trained water treatment operators	3	5	Very High	5 trained operators, one trainee; scheduled leave; refresher training every 3 years; all water operators have Certificate III qualifications in water operations	1	5	High		
Failure of PLC	2	5	Very High	Visual inspection by experienced water operators; established maintenance programs; critical spares	1	5	High		POSSIBLE CAUSES: electrical / mechanical failure, loss of communication between PLCs, etc
Reservoirs									
Pathogens									
Breach of reservoir integrity	5	5	Very High	Chlorine residual; regular cleaning program; all reservoirs and tanks roofed, secure; flashing; hatches built to AS/NZS; predictive maintenance; gauze and rubber ring around overflows	1	5	High	▪ Weekly visual insp. ▪ Inspection of high-risk reservoir roofs monthly /low-risk reservoir roofs every two months ▪ Online free chlorine analysers at Prunevale PS and Cootamundra depot	POSSIBLE CAUSES: inadequate repairs / maintenance, pests, vermin, etc.
Aged water at Young Terminal Storage (YTS)	3	5	Very High	Manual dose of liquid chlorine into YTS; GWCC has a chlorine booster station at Demondrille; online chlorine analyser at Prunevale PS	2	5	Very High	▪ Weekly chlorine residual testing in reticulation ▪ Monthly bacto sampling	POSSIBLE CAUSES: seasonal consumption, operational constraints, specifically affects Young Terminal Storage Young township has a peak demand of approx 7 - 8 ML/day. YTS has a 32 ML capacity. Currently the YTS is maintained at a level of 90%.

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Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes / Recommendations
									GWCC would like to maintain a lower operating level to maintain chlorine residual and YSC needs to keep operating level high to maintain pressure in the town. REC: GWCC to liaise with Young Shire Council (YSC) to develop operational or capital solutions to eliminate aged water in YTS and to maintain pressure for Young township.
Sabotage or vandalism of reservoir / accidental or negligent contamination	2	5	Very High	Prevention of unauthorised access; chlorine residual; locked hatches; security fences; locked ladders; signage with emergency numbers	1	5	High	▪ Weekly visual inspection ▪ Weekly chlorine residual testing in reticulation ▪ Online free chlorine analysers at Prunevale PS and Cootamundra depot	REC: GWCC to consider alarming hatch doors in case of sabotage or vandalism REC: GWCC to consider purging reservoir as part of emergency response if contamination is suspected
Short circuiting of water within reservoirs	4	4	Very High	Most reservoirs are top inlet and bottom outlet; some reservoirs have risers on the bottom;	2	4	High	▪ 3xWeekly chlorine residual testing in reticulation ▪ Online free chlorine analysers at Prunevale PS and Cootamundra depot ▪ SCADA / telemetry	Whilst most reservoirs are top inlet with bottom outlet, there are some reservoirs with bottom inlet and bottom outlet.
Breach of pipelines	5	4	Very High	Preventative maintenance program (air valve servicing); mains replacement program; chlorine residual; protocol and procedures for new & repairs; internal maintenance on all mains; training program for contractors; flushing until	1	4	High	▪ Online free chlorine analysers at Prunevale PS and Cootamundra depot ▪ 3xWeekly chlorine residual testing in reticulation	POSSIBLE CAUSES: breaks, inappropriate maintenance, new or service works, etc. Renewing of mains is performed by contractors. Any contractors employed to renew mains must undergo training and brief of GWCC work method statements. Procedure for disinfecting pipes during mains installation: all pipes disinfected prior to installation and main is superchlorinated once installed as per

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Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes / Recommendations
				chlorine residual is detected (mains break); procedure for disinfection of pipes during mains installation				▪ SCADA / telemetry	GWCC procedure
Chemicals									
Rust forming in steel reservoirs	3	3	High	Cathodic protection on most steel reservoirs; reservoir cleaning and inspection; painting of reservoir; scheduled maintenance and coating replacement program	2	3	Moderate	▪ Weekly visual reservoir inspection	
Reticulation System									
Pathogens									
Contamination due to cross-connections and backflows	5	5	Very High	Chlorine residual; high risk areas identified; pressure control; regular cleaning program; high risk areas have RPZs; meter replacement; dual check valves on new meters; GWCC inspects council- required RPZs; GWCC backflow prevention policy; high volume consumers have their dual check valve meters changed every 12 months	2	5	Very High	▪ Online free chlorine analysers at Prunevale PS and Cootamundra depot ▪ 3xWeekly chlorine residual testing in reticulation ▪ SCADA/telemetry ▪ Monthly bacto sampling	POSSIBLE CAUSES: rainwater tanks, private bores, water carters, failure of transmission pumps, water hammer, hydrant usage, negative pressure, illegal private lines, rural connections (OSSMS, chemicals, pesticides as well as possible cross connection with private dam water), abattoirs, animal troughs, etc. High risk areas incl. schools, abattoirs, hospitals, etc Meter replacement program: old meters are progressively replaced with dual check valve meters. GWCC inspect RPZs that they require to be installed but sub-contracted plumbers inspect RPZs on the consumer side. Note: this risk includes the meter on GWCC main that is owned by HSC. Not all GWCC standpipes have BFPD - only a lay-flat hose. GWCC do not have a register of water carters operating within the area. REC: GWCC to consider training staff in backflow prevention. REC: GWCC to consider conducting a community education program on backflow prevention.

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Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes / Recommendations
									REC: GWCC to liaise with bulk water councils to ensure concurrence with all DA. REC: GWCC to develop a register for water carters and investigate options for electronic card systems on standpipes to record water carter access. REC: GWCC to develop and maintain a register of RPZs within distribution system. Once a register has been developed, it is recommended that GWCC implement a BFPD inspection schedule for all high risk connections etc. REC: GWCC in conjunction with HSC to investigate options at HSC water meter eg. constructing a reservoir.
Loss of chlorine residual due to long reticulation	4	4	Very High	Limited chlorine residual; mobile chlorine dosing unit available for back up; automatic chlorine cylinder changeover; secondary chlorination facilities; manual dosing of chlorine in reservoir	1	4	High	▪ Online free chlorine analysers at Prunevale PS and Cootamundra depot ▪ 3x weekly chlorine residual testing in reticulation ▪ Monthly bacto sampling ▪ SCADA/telemetry	POSSIBLE CAUSES: long retic lines REC: GWCC to complete live chlorine monitoring system for reticulation system (in progress)
Inadequate chlorine residual									
Failure of secondary disinfection units (chlorine boosters)	3	3	High	Limited chlorine residual; mobile chlorine dosing unit for back up; automatic chlorine cylinder changeover; redundancy - duty/standby; scales for chlorine cylinders; procurement processes - chlorine delivery every 3 weeks; visual inspection of booster stations	1	3	Moderate	▪ Online free chlorine analysers at Prunevale PS and Cootamundra depot ▪ Daily chlorine residual testing in reticulation ▪ SCADA / telemetry ▪ Monthly bacto	POSSIBLE CAUSES: electrical / mechanical failure, pipe failure, running out of chemical, failure of alarms / monitoring equipment, incorrect dosing, human error, leaking injector hose etc REC: GWCC to complete live chlorine monitoring system for reticulation system (in progress)

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Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes / Recommendations
								sampling	
Dead ends in reticulation system leading to stagnation	3	2	Moderate	Reactive dead end looping; mains flushing program; annual swabbing of mains; reactive flushing after dirty water complaints	2	2	Low		

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10.3.3 Table 3 – Oura Drinking Water Supply System Risk Assessment

Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes
	Likelihood	Consequence	Maximum risk	What control measures are currently in place?	Likelihood	Consequence	Residual Risk		
Oura Borefield									
Pathogens									
Surface water ingress or short-circuiting of contaminants at poorly constructed or maintained bores	3	5	Very High	Very well-constructed bores; all bores in secure bore huts; disinfection; secure boreheads; disinfection	1	5	High	▪ Water quality tests and visual checks after storm events ▪ Daily visual inspection ▪ Daily chlorine residual testing at disinfection ▪ Monthly bacto sampling ▪ 3x weekly free chlorine testing in reticulation	REC: GWCC to conduct bacto sampling after storm event if visual check of bores show signs of being compromised.
Unrestricted livestock and/or wildlife access to areas surrounding borefields	5	5	Very High	Rotation of bore selection due to quality and output; maintenance program; all bore huts secure and vermin-proof; disinfection; secure boreheads; cattle fences around bores Disinfection	1	5	High	▪ Daily visual inspection ▪ Daily chlorine residual testing at disinfection ▪ Monthly bacto sampling ▪ 3x weekly free chlorine testing in reticulation	
Aquifer contamination due to seepage of pathogens from a point source eg. OSSM	3	5	Very High	Rotation of bore selection due to quality and output; established maintenance program; all bore huts secure and vermin-proof; Disinfection	1	5	High	▪ Daily visual inspection ▪ Daily chlorine residual testing at disinfection ▪ Monthly bacto sampling ▪ 3x weekly free chlorine testing in reticulation	POSSIBLE CAUSES: OSSM located in same area as aquifer. No service stations and no opportunities for chemical point source leaks.

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Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes
Poor operation and management of non-GWCC managed bores (cross-contamination of aquifers)	3	5	Very High	Disinfection	1	5	High	▪ Daily chlorine residual testing at disinfection ▪ Monthly bacto sampling ▪ 3x weekly free chlorine testing in reticulation	The bore in close proximity to the Oura Borefield was constructed by GWCC and sold to private farmer. The bore has a raised bore hut, no fences. GWCC is unaware of how the private bore is managed. REC: educate private bore owner to ensure he knows that the bore accesses the drinking water aquifer
Surface water - groundwater interactions bringing contaminants into aquifer	1	5	High	Disinfection	1	5	High	▪ Water quality tests and visual checks after storm events ▪ Daily visual inspection ▪ Daily chlorine residual testing at disinfection ▪ Monthly bacto sampling ▪ 3x weekly free chlorine testing in reticulation	REC: GWCC to conduct bacto sampling after storm event if visual check of bores show signs of being compromised.
Chemicals									
Naturally occurring concentrations above ADWG values e.g. iron	5	3	Very High	Aeration; chlorine dosing to oxidise iron; 'settling' reservoirs	1	3	Moderate		Water passes through three settling reservoirs located at Junee where the iron is able to settle out before distribution.
Loss of supply									
Loss of supply due to low water table	2	4	High	Notify Manager Distribution and Construction of unusual events	1	4	High	▪ Daily visual inspection ▪ SCADA / telemetry	POSSIBLE CAUSES: drought, over-extraction, low water table Past incident: operators haven't noticed any changes in quality due to lowering of water table

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Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes
Water Treatment Process									
Pathogens									
Failure of disinfection	5	5	**Very High**	Established preventative maintenance programs; target criteria established for chlorine residual; redundancy - duty/standby chlorine dosing pumps; scales on chlorine cylinders; well-trained operators	2	5	**Very High**	▪ Daily visual inspection ▪ SCADA / telemetry ▪ Daily chlorine residual testing at disinfection ▪ Monthly bacto sampling ▪ 3x weekly free chlorine testing in reticulation	POSSIBLE CAUSES: mechanical / electrical failures; running out of chemical; incorrect dosage, human error Past issues: interference between chlorine testing reagent and manganese in the sample water, leading to a false high reading. REC: GWCC to consider conducting internal training on chlorine residual testing. REC: GWCC to consider developing SOPs for chlorine testing to include manganese interference with reagent. REC: GWCC to consider purchasing electronic chlorine analyser to eliminate manganese interference with chlorine residual testing as per DPI Water recommendation (eg chloro-sense kits) REC: GWCC to consider installing an online free chlorine analyser at Oura disinfection point (after 30 min contact time).
Vermin access to aeration tower	3	5	**Very High**	Regular cleaning program; established maintenance program; daily visual inspection of tank roofs for vermin; disinfection; partial shade cloth around aerator	1	5	**High**	▪ Daily visual inspection ▪ SCADA / telemetry ▪ Daily chlorine residual testing at disinfection ▪ Monthly bacto sampling ▪ 3x weekly free chlorine testing in reticulation	POSSIBLE CAUSES: birds, possums, frogs, etc.

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Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes
Loss of supply									
Power failure	3	3	**High**	Water cannot be pumped during power failures; notify Manager of Distribution and Construction of unusual events; able to manually dose at Junee reservoirs; increased monitoring during power outages; alternate water source (Jugiong can supply to parts of Oura system);	1	3	**Moderate**	▪ Daily visual inspection ▪ SCADA / telemetry	If power is lost at the treatment process, chlorine residual can be depleted in Junee Reservoir REC: GWCC to consider increasing monitoring of chlorine residual throughout system during power outages. REC: GWCC to develop a business continuity plan (in progress).
Chemicals									
Failure of iron oxidation	3	3	**High**	Four outlets for the aerator system; scales on chlorine tanks	1	3	**Moderate**	▪ Daily visual inspection ▪ SCADA / telemetry	POSSIBLE CAUSES: pump failure, changes in raw water quality, chlorine dosing failure, etc. There are four aerator sections in the Oura aeration tower. GWCC operators have the ability to take selective sections to perform maintenance etc.
Overdose of fluoride	3	3	**High**	Well-trained operators; fluoridation system designed as per *Code of Practice for the Fluoridation of Public Water Supplies*; chemical drop tests; control of chemical stock; Form 3 filled out daily; Prominent system cannot theoretically overdose; fluoride calculations performed daily	2	3	**Moderate**	▪ Daily visual inspection ▪ SCADA / telemetry ▪ Daily natural fluoride monitoring ▪ Daily treated water fluoride monitoring	POSSIBLE CAUSES: mechanical / electrical failure, poor chemical quality, human error, etc Past incident: failure of solenoid valves in fluoride dosing system, leading to overdosing of fluoride. REC: GWCC to consider performing preventative maintenance on solenoid valves leading into fluoride batching tank. REC: GWCC to consider checking fluoride alarms weekly, as per DPI Water recommendation REC: GWCC to check data entry to ensure no errors and record all incidents and causes of high readings (eg data entry error, human error, etc)

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Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes
All of System									
Pathogens									
Loss of trained water treatment operators	3	5	Very High	7 trained operators; scheduled leave; refresher training every 3 years; all water operators have Certificate III qualifications in water operations	1	5	High		
Reservoirs									
Pathogens									
Breach of reservoir integrity	5	5	Very High	Secondary chlorination at Reefton and Thanowring Rd PS; regular cleaning program; regular inspection of tank roofs for vermin; all tanks and reservoirs roofed; chlorine residual; bacto testing monthly; online turbidity meter from Oura plant to Junee reservoirs; ongoing maintenance program to ensure all reservoirs meet AS/NZS	2	5	Very High	▪ 3x weekly free chlorine testing in reticulation ▪ Weekly visual inspection of reservoir ▪ Inspection of high-risk reservoir roofs monthly ▪ Inspection of low-risk reservoir roofs every two months ▪ Online free chlorine analysers at Wyalong PS ▪ Monthly bacto test	POSSIBLE CAUSES: inadequate repairs / maintenance, pests, vermin, etc. REC: ensure all hatches on reservoirs comply with AS/NZS REC: GWCC to consider installing online chlorine analysers at Oura and Ariah Park PS

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Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes
Sabotage or vandalism of reservoir / accidental or negligent contamination	2	5	Very High	Prevention of unauthorised access; chlorine residual; roofed reservoirs; locked hatches; man-proof fences	1	5	High	▪ 3x weekly free chlorine testing in reticulation ▪ Weekly visual inspection of reservoir ▪ Inspection of high-risk reservoir roofs monthly ▪ Inspection of low-risk reservoir roofs every two months ▪ Online free chlorine analysers at Wyalong PS and Reefton PS ▪ Monthly bacto test	REC: GWCC to consider alarming reservoir hatch doors in case of sabotage or vandalism. REC: GWCC to consider purging reservoir as part of emergency response if contamination is suspected.
Reticulation									
Pathogens									
Breach of pipelines	5	4	Very High	Preventative maintenance program; mains replacement program; repairs carried out as per manufacturer's instructions; chlorine residual	1	4	High	▪ Online chlorine residual analyser at Wyalong PS ▪ 3x weekly free chlorine testing in reticulation ▪ Monthly bacto test	POSSIBLE CAUSES: breaks, inappropriate maintenance, new or service works, etc. Approximately 4-8 breaks per month in Oura system.
Contamination due to cross-connections and backflows	4	5	Very High	Chlorine residual; high risk areas identified; pressure control; regular cleaning program; high risk areas have RPZs; meter replacement; dual check valves on new meters; GWCC inspects council- required RPZs; GWCC backflow prevention policy; high volume consumers have their dual check valve meters changed every 12 months	2	5	Very High	▪ Online chlorine residual analyser at Wyalong PS and Reefton PS ▪ 3x weekly free chlorine testing in reticulation ▪ Monthly bacto test	POSSIBLE CAUSES: rainwater tanks, private bores, stock troughs, water carters, failure of transmission pumps, water hammer, hydrant usage, etc. High risk areas incl. schools, abattoirs, hospital Meter replacement program: old meters are progressively replaced with dual check valve meters. GWCC inspect RPZs that they require to be installed but sub-contracted plumbers inspect RPZs on the consumer side.

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Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes
									Not all GWCC standpipes have BFPD - only a lay-flat hose. GWCC do not have a register of water carters operating within the area. REC: GWCC to consider training staff in backflow prevention. REC: GWCC to consider conducting a community education program on backflow prevention. REC: GWCC to develop a register for water carters and investigate options for electronic card systems on standpipes to record water carter access. REC: GWCC to consider developing and maintaining a register of RPZs within distribution system. Once a register has been developed, it is recommended that GWCC implement a BFPD inspection schedule for all high risk connections including hospitals, schools, rural properties, etc.
Cross-connection with non-potable supply (Hylands Bridge)	3	5	Very High	Reflux valve; able to visually see if valves are open or close; chlorine residual	2	5	Very High	▪ Online chlorine residual analyser at Wyalong PS ▪ Weekly chlorine residual testing ▪ Monthly bacto testing	POSSIBLE CAUSES: Hylands Bridge's non-potable supply can be supplemented by the Oura system during drought. REC: GWCC to consider and investigate and install the most suitable BFPD on the connection between Oura and Hylands Bridge (eg RPZ, break tank with air gap, etc)

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Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes
Inadequate chlorine residual									
Loss of chlorine due to long reticulation	4	4	**Very High**	Two chlorine booster stations on both branches at Temora; chlorine residual	2	4	**High**	▪ Online chlorine residual analyser at Wyalong PS ▪ 3x weekly chlorine testing ▪ Monthly bacto testing	Oura has the longest reticulation mains managed by GWCC.
Failure of secondary disinfection units (chlorine boosters)	3	3	**High**	Established maintenance program	1	3	**Moderate**	▪ Online chlorine residual analyser at Wyalong PS ▪ SCADA / telemetry	POSSIBLE CAUSES: electrical / mechanical failure, pipe failure, running out of chemical, failure of alarms / monitoring equipment, incorrect dosing, etc
Aesthetic issues - taste, odour, colour									
Dead ends in reticulation system leading to stagnation	5	2	**High**	Swabbing and flushing undertaken up to 2x yearly; 'settling'	3	2	**Moderate**		Water passes through three settling reservoirs located at Junee where the iron is able to settle out before distribution. The Oura system has hundreds of dead ends.

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10.3.4 Table 4 – Mt Arthur Drinking Water Supply System Risk Assessment

Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes
	Likelihood	Consequence	Maximum risk	What control measures are currently in place?	Likelihood	Consequence	Residual Risk		
Mt Arthur Bores									
Pathogens									
Surface water ingress or short-circuiting of contaminants at poorly constructed and maintained bores	3	4	Very High	Very well-constructed bores; al bores in secure bore huts; disinfection; secure boreheads	1	4	High	▪ Water quality tests and visual checks after storm events ▪ Weekly visual inspection ▪ 3x weekly chlorine residual testing at disinfection ▪ Monthly bacto sampling ▪ Daily free chlorine testing in reticulation	REC: GWCC to conduct bacto sampling after storm event if visual check of bores show signs of being compromised.
Aquifer contamination due to seepage of pathogens from a point source	4	4	Very High	Chlorine residual	1	4	High	▪ Weekly visual inspection ▪ 3x weekly chlorine residual testing at disinfection ▪ Daily free chlorine testing in reticulation ▪ Monthly bacto sampling	POSSIBLE CAUSES: OSSMS on rural properties

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Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes
Chemicals									
Naturally occurring concentrations above ADWG values e.g. iron	5	3	Very High	'Settling' reservoirs in Ganmain; oxidation with chlorine	1	3	Moderate		Ganmain has three 'settling' tanks with baffles to drop out iron
Loss of supply									
Loss of supply due to low water table	2	4	High	Notify operations coordinator of unusual events	1	4	High	▪ Weekly visual inspection ▪ SCADA / telemetry	POSSIBLE CAUSES: drought
Water Treatment Process									
Pathogens									
Failure of disinfection	4	4	Very High	Manual dosing of reservoir in case of failure; manual dosing at settling tank in case of failure; preventative maintenance schedule; target criteria established for chlorine residual; redundancy - duty/standby chlorine dosing pumps; well- trained operators	1	4	High	▪ Daily visual inspection of chlorine dosing	POSSIBLE CAUSES: mechanical / electrical failures; poor chemical quality; running out of chemical; incorrect dosing rates; power failure REC: GWCC to consider installing online chlorine residual analyser at outlet of settling tanks to ensure 30 minutes contact time.
Power failure	3	4	Very High	Manual dosing at settling tank; ability to manually switch off bore pumping in case of power failure at chlorination point	1	4	High	▪ SCADA / telemetry ▪ Daily chlorine residual testing	REC: GWCC to consider installing online chlorine residual analyser at outlet of settling tanks.

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Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes
Chemicals									
Overdosing of chlorine	3	3	High	Target criteria for chlorine residual; well-trained operators	1	3	Moderate	▪ Weekly visual inspection ▪ Daily chlorine residual testing	POSSIBLE CAUSES: electrical / mechanical failure, pipe failure, running out of chemical, blockages, human error, etc. REC: GWCC to consider installing online chlorine residual analyser at reservoir outlet
All of System									
Pathogens									
Loss of trained water treatment operators	3	5	Very High	7 trained operators; scheduled leave; refresher training every 3 years; all water operators have Certificate III qualifications in water operations	1	5	High		
Failure of SCADA / telemetry	3	4	Very High	Established maintenance programs; disinfection; SCADA checked daily by multiple operators	1	4	High	▪ Weekly visual inspection	
Reservoirs									
Pathogens									
Breach of reservoir integrity	5	5	Very High	Regular cleaning program; regular inspection of tank roofs for vermin; all tanks and reservoirs roofed; chlorine residual; bacto testing monthly; ongoing maintenance program to ensure all reservoirs meet	2	5	Very High	▪ 3x weekly free chlorine testing in reticulation ▪ Weekly visual inspection of reservoir ▪ Inspection of high-risk reservoir roofs	POSSIBLE CAUSES: inadequate repairs / maintenance, pests, vermin, etc. REC: ensure all hatches on reservoirs comply with AS/NZS

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Drinking Water Management System

Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes
				AS/NZS				monthly ▪ Inspection of low-risk reservoir roofs every two months ▪ Monthly bacto test	
Sabotage or vandalism of reservoir (unauthorised access) / accidental or negligent contamination	2	5	Very High	Prevention of unauthorised access; chlorine residual; locked hatches; security fences; locked ladders; signage with emergency numbers	1	5	High	▪ 3x weekly free chlorine testing in reticulation ▪ Weekly visual inspection of reservoir ▪ Inspection of high-risk reservoir roofs monthly ▪ Inspection of low-risk reservoir roofs every two months ▪ Monthly bacto test	REC: GWCC to consider alarming hatch doors in case of sabotage or vandalism REC: GWCC to consider purging reservoir as part of emergency response if contamination is suspected
Reticulation									
Pathogens									
Contamination due to cross-connections and backflows	4	5	Very High	Chlorine residual; high risk areas identified; pressure control; regular cleaning program; high risk areas have RPZs; meter replacement; dual check valves on new meters; GWCC inspects council-required RPZs; GWCC backflow prevention policy; high volume consumers have their dual check valve meters changed every 12 months	2	5	Very High	▪ 3x weekly free chlorine testing in reticulation	POSSIBLE CAUSES: rainwater tanks, private bores, stock troughs, water carters, failure of transmission pumps, water hammer, hydrant usage, etc. High risk areas include schools, hospitals, etc. Meter replacement program: old meters are progressively replaced with dual check valve meters. GWCC inspect RPZs that they require to be installed but sub-contracted plumbers inspect RPZs on the consumer side. Not all GWCC standpipes have BFPD - only a lay-flat hose. GWCC do not have a register of water carters operating within the area.

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Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes
									REC: GWCC to consider training staff in backflow prevention REC: GWCC to consider conducting a community education program on the importance of backflow prevention. REC: GWCC to develop a register for water carters and investigate options for electronic card systems on standpipes to record water carter access. REC: GWCC to consider developing and maintaining a register of RPZs within distribution system. Once a register has been developed, it is recommended that GWCC implement a BFPD inspection schedule for all high risk connections including hospitals, schools, rural properties, etc.
Aesthetic issues - taste, odour, colour									
Dead ends in reticulation system leading to stagnation	3	2	Moderate	Settling tanks - iron removal; scheduled maintenance - flushing	2	2	Low		Approximately 30 dead ends in Mt Arthur reticulation system

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Drinking Water Management System

10.3.5 Table 5 – Mt Daylight Drinking Water Supply System Risk Assessment

Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes
	Likelihood	Consequence	Maximum risk	What control measures are currently in place?	Likelihood	Consequence	Residual Risk		
Mt Daylight Bores									
Pathogens									
Surface water ingress or short-circuiting of contaminants at poorly constructed and maintained bores	4	4	Very High	Borehead protection; disinfection	2	4	High	▪ Online chlorine analyser at Naradhan Reservoir inlet ▪ Weekly visual inspection ▪ Weekly chlorine residual testing in reticulation ▪ Monthly bacto tests at reservoir	POSSIBLE CAUSES: unrestricted livestock and wildlife access in areas surrounding bores, lack of maintenance by Carrathool Shire Mt Daylight bores are operated and maintained by Carrathool Shire Council. GWCC does not have control over the bores. REC: GWCC to consider developing a communication protocol with Carrathool Shire Council to ensure pertinent information regarding bore water protection and reservoir integrity is shared.
Unrestricted livestock and / or wildlife access to areas surrounding bores	4	4	Very High	Man-proof fence around bores; borehead protection; disinfection	1	4	High	▪ Online chlorine analyser at Naradhan Reservoir inlet ▪ Weekly visual inspection ▪ Weekly chlorine residual testing in reticulation ▪ Monthly bacto tests at reservoir	Mt Daylight bores are operated and maintained by Carrathool Shire Council. GWCC does not have control over the bores. REC: GWCC to consider developing a communication protocol with Carrathool Shire Council to ensure pertinent information regarding bore water protection and reservoir integrity is shared.

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Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes
Aquifer contamination due to ingress of pathogens from flooding	2	4	High	Borehead protection; disinfection	2	4	High	▪ Online chlorine analyser at Naradhan Reservoir inlet ▪ Weekly visual inspection ▪ Weekly chlorine residual testing in reticulation ▪ Monthly bacto tests at reservoir	POSSIBLE CAUSES: OSSM from rural properties There is no STP in the surrounding area. Mt Daylight bores are operated and maintained by Carrathool Shire Council. GWCC does not have control over the bores. REC: GWCC to consider developing a communication protocol with Carrathool Shire Council to ensure pertinent information regarding bore water protection and reservoir integrity is shared
Loss of Supply									
Loss of supply due to low water table	3	4	Very High	Notify operations coordinator of unusual events; bore draw down indication	2	4	High	▪ SCADA / telemetry	POSSIBLE CAUSES: drought

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Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes
Bores and Carrathool Shire Council Non-Drinking Water Reservoir									
Pathogens									
Poor operation and management of Carrathool Shire Council managed bores and non- potable reservoir	3	4	Very High	Chlorine residual; disinfection	1	4	High	▪ Online chlorine analyser at Naradhan Reservoir inlet ▪ Weekly visual inspection ▪ Weekly chlorine residual testing in reticulation ▪ Monthly bacto tests at reservoir	Current set up - bores pump based on GWCC reservoir levels. The water is chlorinated at reservoir inlet. These reservoirs can be balanced with the Carrathool Shire Council which are not managed very well (open roof, etc) - potential issue of contamination of GWCC water REC: GWCC to consider developing a communication protocol with Carrathool Shire Council to ensure pertinent information regarding bore water protection and reservoir integrity is shared.
Water Treatment Process									
Pathogens									
Failure of disinfection	4	4	Very High	Established maintenance programs; target criteria established for chlorine residual; chlorine scales; procurement process; alarms on leaks; delivery of chlorine every 3 weeks	2	4	High	▪ SCADA/telemetry ▪ Online chlorine analyser at Naradhan Reservoir inlet ▪ Weekly visual inspection ▪ Weekly chlorine residual testing in reticulation ▪ Monthly bacto tests at reservoir	POSSIBLE CAUSES: mechanical / electrical failures, running out of chemical, incorrect dosage, power failure, etc. Possible oxidation and settling of iron in 4 reservoirs due to relocation of chlorine dosing point from reservoir outlet to reservoir inlet. Since relocation of chlorine dosing, there have been no failures of disinfection. REC: GWCC to consider changing location of online chlorine analyser to ensure free chlorine measurement after 30 min contact time. Both the chlorine dosing and the chlorine analyser are located at the reservoir inlet.
Chemicals									
Overdosing of chlorine	3	3	High	Target criteria for chlorine residual; well-trained operators	1	3	Moderate	▪ Online chlorine analyser at reservoir inlet	POSSIBLE CAUSES: mechanical/electrical failures, incorrect dosage, etc.

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Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes
								▪ Weekly visual ▪ Weekly chlorine residual testing in reticulation	
All of System									
Pathogens									
Loss of trained water treatment operators	3	5	Very High	7 trained operator; scheduled leave; refresher training every 3 years; all water operators have Certificate III qualifications in water operations	1	5	High		
Failure of SCADA / telemetry	3	4	Very High	Established maintenance programs; target criteria established for chlorine residual; disinfection; SCADA checked daily by multiple operators	1	4	High	▪ Weekly visual inspection by experienced water operators ▪ Daily chlorine residual testing ▪ SCADA / telemetry	
Reservoirs									
Pathogens									
Breach of reservoir integrity	5	4	Very High	All tanks roofed; hatches recently replaced in Mt Daylight	1	4	High	▪ Weekly chlorine residual testing ▪ Weekly inspection of tank roofs for vermin ▪ Inspection of high-risk reservoir roofs monthly / low-risk reservoir roofs every two months	POSSIBLE CAUSES: inadequate repairs / maintenance, pests, vermin, etc.

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Drinking Water Management System

Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes
Sabotage or vandalism of reservoir (unauthorised access) / accidental or negligent contamination	2	4	High	Prevention of unauthorised access; chlorine residual; locked hatches; security fences; locked ladders; signage with emergency numbers	1	4	High	▪ Weekly chlorine residual testing ▪ Weekly inspection of tank roofs for vermin ▪ Inspection of high-risk reservoir roofs monthly /low-risk reservoir roofs every two months	REC: GWCC to consider developing a system of different key levels to increase security REC: GWCC to consider alarming hatch doors in case of sabotage or vandalism - particularly at the Mt Daylight reservoir as it is more remote REC: GWCC to consider purging reservoir as part of emergency response if contamination is suspected
Reticulation System									
Pathogens									
Breach of pipelines through breaks, inappropriate maintenance, new or service works etc	5	4	Very High	Preventative maintenance program (air valve servicing); mains replacement program; chlorine residual; protocol and procedures for new & repairs; internal maintenance on all mains; training program for contactors; flushing until chlorine residual is detected (mains break); procedure for disinfection of pipes during mains installation	1	4	High	▪ Weekly chlorine residual testing in reticulation ▪ SCADA / telemetry	POSSIBLE CAUSES: breaks, inappropriate maintenance, new or service works, etc. Approximately 4 breaks per month in Mt Daylight Renewing of mains is performed by contractors. Any contractors employed to renew mains must undergo training and brief of GWCC work method statements. Procedure for disinfecting pipes during mains installation: all pipes disinfected prior to installation and main is superchlorinated once installed as per AS/NZS 3500

Goldenfields Water

Drinking Water Management System

Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes
Contamination due to cross-connections and backflows	5	4	Very High	Chlorine residual; 2 operators trained in backflow prevention; high risk areas identified; pressure control; regular cleaning program; high risk areas have RPZs; meter replacement; dual check valves on new meters; GWCC inspects council- required RPZs; GWCC backflow prevention policy; high volume consumers have their dual check valve meters changed every 12 months	2	4	High	▪ Weekly chlorine residual testing in reticulation ▪ Monthly bacto test	POSSIBLE CAUSES: rainwater tanks, private bores, stock troughs, water carters, failure of transmission pumps, water hammer, hydrant usage, etc. High risk areas incl. schools, abattoirs, hospital Meter replacement program: old meters are progressively replaced with dual check valve meters. GWCC inspect RPZs that they require to be installed but sub-contracted plumbers inspect RPZs on the consumer side. Not all GWCC standpipes have BFPD - only a lay-flat hose. GWCC do not have a register of water carters operating within the area. REC: GWCC to consider installing backflow prevention devices (BFPD) on all rural property connections, as recommended by DPI Water. REC: GWCC to comply with AS/NZS 3500 as per DPI Water recommendation REC: GWCC to consider conducting a community education program on backflow prevention. REC: GWCC to liaise with Councils in Oura distribution to ensure concurrence with all DA. REC: GWCC to install appropriate BFPD on all standpipes e.g. RPZs REC: GWCC to develop a register for water carters and investigate options for electronic card systems on standpipes to record water carter access. REC: GWCC to consider developing and maintaining a register of RPZs within distribution system. Once a register has been developed, it is recommended that GWCC implement a BFPD inspection schedule for all high risk connections including hospitals, schools, rural properties, etc.

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Drinking Water Management System

Hazardous event	Maximum Risk with no Preventive Measures			Preventive Measures	Residual Risk with Preventive Measures			Monitoring	Notes
Aesthetic Issues - taste, odour, colour									
Dead ends in reticulation system leading to stagnation (aesthetic impacts)	2	2	Low	Reactive maintenance - flushing	2	2	Low		Less than 20 dead ends in the Mt Daylight system

11 APPENDIX B CRITICAL CONTROL POINTS

11.1 Version Control

Document Status:	Issued			
Document History:	**Status**	**Author**	**Version**	**Date**
	Issued as part of 2015 DWMS	HydoScience	1.0	November 2015
	Issued to Geoffrey Veneris (GWCC), Tony Burns (NSW Health PHU) and Bernie Barnes (DPI Water)	Atom Consulting	2.0	March 2017
	Reviewed and Updated	Chris Breen		November 2022
Current version authors:	Natalie Crawford (Atom Consulting), Annalisa Contos (Atom Consulting)			
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File Name:	GWCC_CCP review_V1.1.docx			

11.2 Amendment Summary

A summary of the changes made to critical control points is shown in table 1.

Table 1. Critical and operational control point summary of changes

Version	System	CCPs
Version 2.0 March 2017	Jugiong	All CCPs – Added table at beginning of each CCP documenting, what is being measured; where/how it measured; what is the control point and what are the hazards.
		CCP1 Extraction Management - Protocols updated to reflect onsite practices.
		CCP2 Filtration - Protocols updated to reflect onsite practices.
		CCP3 Disinfection - Protocols updated to reflect onsite practices.
		CCP4 Fluoridation - Adjustment limit amended to < 0.95 mg/L or > 1.05 mg/L from <0.9 mg/Lor > 1.2 mg/L. Protocols updated to reflect onsite practices.
		CCP 5 pH adjustment - changed to an operational control point OCP1 pH adjustment. Protocols updated to reflect onsite practices.
		CCP 5 Reservoir integrity – Changed from CCP6 Reservoir integrity. Protocols updated to reflect onsite practices.
		CCP 6 Secondary disinfection – changed from CCP 7 Secondary disinfection. Protocols updated to reflect onsite practices.
	Oura	All CCPs – Added table at beginning of each CCP documenting, what is being measured; where/how it measured; what is the control point and what are the hazards.
		CCP 1 Disinfection – Target limit 0.4 mg/L changed to 0.5 mg/L. Protocols updated to reflect onsite practices.
		CCP2 Fluoridation - Protocols updated to reflect onsite practices.
		CCP3 Reservoir integrity - Protocols updated to reflect onsite practices.
		CCP4 Secondary disinfection – Combined CCP4 and CCP5 Secondary disinfection for Wyalong and Thanowring.

	Mt Arthur	All CCPs – Added table at beginning of each CCP documenting, what is being measured; where/how it measured; what is the control point and what are the hazards.
		CCP1 Disinfection - Protocols updated to reflect onsite practices.
		CCP2 Reservoir integrity - Protocols updated to reflect onsite practices.
	Mt Daylight	All CCPs – Added table at beginning of each CCP documenting, what is being measured; where/how it measured; what is the control point and what are the hazards.
		CCP1 Disinfection - Protocols updated to reflect onsite practices.
		CCP2 Reservoir integrity - Protocols updated to reflect onsite practices.

11.3 Jugiong Critical Control Points

The critical parameters for the safe management of the Jugiong water supply system are shown below and should be displayed at Jugiong WTP.

Target Criteria	This is where you should be operating. Aim to keep the system operating at this value.
Adjustment Limit	If you reach this limit, refer to CCP management sheet and try to get back to the operational target. Increase monitoring until returned to normal.
Critical Limit	If you reach this limit, you have lost control of your system. Refer to CCP management sheet and try to return to operational target as a matter of urgency.

11.3.1 CCP1 Extraction Management

What is being measured?	Turbidity (continuous online)
Where/how is it measured?	Raw water
What is the control point?	Raw water extraction point
What are the hazards?	Turbidity, pathogens

TARGET Operator Set Point (SP)	CRITICAL 20% above SP for > 20 min
▪ Check SCADA daily and respond accordingly to all alarms ▪ Record all observations and monitoring results in diary ▪ Daily (if running): o Visual plant inspection o Visual inspection of river level (river gauge) o Check weather forecast o Manual sampling of raw water and testing for turbidity o Cross-check online and manual turbidity meters o Jar testing on raw water and adjust chemical dosing as required o Change raw water turbidity set point (SP) based on jar testing results o Check email and phone for any notification sent by State Water of releases from Burrinjuck Dam	▪ Plant will automatically shut down when the critical limit is reached and call operator on duty ▪ Perform jar tests using samples of river water to determine appropriate chemical dose and adjust dosing as required ▪ Notify Water Quality Coordinator and Manager Production Services if raw water quality is not treatable to an acceptable standard and if treated water storages are low ▪ Increase monitoring until system conforms ▪ Prior to restarting raw water extraction, assess the raw water quality and treated water storage levels. Consider ceasing pumping until raw water quality improves

11.3.2 CCP2 Filtration

What is being measured?	Turbidity (Continuous Online)
Where/how is it measured?	Common filter outlet
What is the control point?	Filters
What are the hazards?	Pathogens, turbidity

TARGET ≤ 0.2 NTU	ALERT ≥ 0.5 NTU	CRITICAL ≥ 1.0 NTU
Check SCADA daily and respond accordingly to all alarms Record all observations and monitoring results in diary Daily (if running): o Visual plant inspection o Inspect all plant processes (coagulation, flocculation, clarification, filtration, disinfection) o Manual sampling at common filter outlet and testing of turbidity o Cross-check handheld turbidity meter with online analyser o Check all chemical dosing systems Clean raw water turbidity meter every three weeks Clean filtered water turbidity meter monthly Twice yearly cleaning of filters - drain, clean and disinfect Perform scheduled preventative maintenance	Record all observations, monitoring results and operational changes in plant diary Repeat operational checks Check the coagulation, flocculation, clarification performance Check chemical dosing systems: o Check for blockages, leaks o Check chemical storage levels o Check polymer concentration in poly maturation tank o Drop tests and adjust dosing as required o Refer to past records for chemical dosage guide Notify and seek assistance from supervisor Perform jar tests and adjust dosing as required (note: use polymer in maturation tank for jar tests) Perform visual and handheld turbidity tests on individual filter outlets to determine if it is a common problem. o If it is one filter that is underperforming, isolate the filter and initiate a backwash o If it is a common issue, investigate raw water quality and prior plant processes ▪ Increase monitoring	Notify supervisor and manager as per Goldenfields Water communication protocols Automatic plant shut down on alarm Consider dumping filter water Repeat corrective actions from alert level If issue is not resolved and water needs to be distributed to keep up with demand: o Notify NSW Health DPI Water as per Goldenfields Water communication protocol o Notify bulk water councils as per Goldenfields Water communication protocol Troubleshoot problem and implement corrective actions as appropriate Increase monitoring

11.3.3 CCP3 Disinfection

What is being measured?	Free chlorine residual (Continuous Online & alarmed)
Where/how is it measured?	Finished water
What is the control point?	Chlorine dosing system
What are the hazards?	Chlorine sensitive pathogens

TARGET	ALERT	CRITICAL
1.8 mg/L	≤ 1.2 mg/L or ≥ 2.0 mg/L	Summer: ≤ 0.8 mg/L for > 30 mins or ≥ 5.0 mg/L Winter: ≤ 0.5 mg/L for > 30 mins or ≥ 5.0 mg/L
▪ Check SCADA daily and respond accordingly to all alarms ▪ Record all observations and monitoring results in diary ▪ Daily (if running): o Visual plant inspection o Manual sampling and testing of finished water free chlorine o Check chlorine dosing system: ▫ Check for blockages, leaks (head unit, injector) ▫ Check chemical storage levels (scales and spare tanks) ▫ Check heater is operational ▪ 1 - 3 times weekly manual free chlorine test in reticulation undertaken by distributions team ▪ Chlorine delivery every 3 weeks ▪ Monthly bacto sampling in reservoirs ▪ Annual servicing of online chlorine analysers	▪ Record all observations and monitoring results in plant diary ▪ Record all operational changes in plant diary ▪ Repeat chlorine dosing system checks ▪ Retest for chlorine ▪ Adjusting chlorine dose ▪ Change dosing point (pre-or mid) ▪ Retest for chlorine ▪ Increase pH, turbidity, total and free chlorine monitoring at No. 2 and Cowangs Reservoirs ▪ Perform drop test and adjust dose as required ▪ Increase monitoring ▪ Notify and seek assistance from supervisor	▪ Automatic plant shut down at critical limit ▪ Notify: o General Manager o Supervisor and manager o DPI Water o NSW Health if free chlorine is < 0.2 mg/L or > 5 mg/L and water has been supplied as per Goldenfields Water communication protocols ▪ Repeat corrective actions from alert level ▪ Increase sampling and testing until at plant, in reservoirs and reticulation. ▪ Record all sampling results ▪ If chlorine residual < 0.5 mg/L o Manually topping up chlorine at reservoirs o Increasing chlorine dose at secondary disinfection units ▪ Troubleshoot problem and implement corrective actions as appropriate ▪ Increase monitoring

11.3.4 CCP4 Fluoridation

What is being measured?	Fluoride daily
Where/how is it measured?	Finished water
What is the control point?	Fluoride dosing point
What are the hazards?	Fluoride overdosing and underdosing

TARGET	ALERT	CRITICAL
1.0 mg/L	< 0.95 mg/L or > 1.05 mg/L	< 0.9 mg/L for > 72 hr or > 1.5 mg/L
▪ Check SCADA daily and respond accordingly to all alarms ▪ Record all observations and monitoring results in diary ▪ Daily (if running): o Visual plant inspection o Manual sampling and testing of raw water fluoride o Manual sampling and testing of treated water fluoride o Complete Form 3 o Check fluoride dosing system: ▫ Check for blockages, leaks ▫ Check chemical storage levels ▫ Check heater operational in fluoride dosing room ▪ Test twice weekly fluoride samples from the reticulation ▪ Monthly: o Perform drop test and adjust dose as required o Clean fluoride hopper	▪ Record all observations and monitoring results in plant diary ▪ Record all operational changes in plant diary ▪ Re-test fluoride ▪ Re-calibrate fluoride probe ▪ Leave to next day, retest fluoride ▪ Confirm daily checks and operational inspections ▪ Allow for changing raw water conditions ▪ Seek assistance from supervisor ▪ Adjust fluoride dose as required ▪ Increase monitoring until	▪ Notify: o General Manager o Supervisor and manager o NSW Health o DPI Water as per Goldenfields Water communication protocols ▪ Shut down fluoride dosing system immediately ▪ Consider dumping fluoride tank and affected pipeline ▪ Follow NSW Health response protocol in the Code of Practice for the Fluoridation of Public Water Supplies ▪ Repeat corrective actions from alert level ▪ If ≥ 1.5 mg/L, notify bulk water councils as per Goldenfields Water communication protocols ▪ Troubleshoot problem and implement corrective actions as appropriate ▪ Increase monitoring

11.3.5 OCP1 PH Adjustment

What is being measured?	pH Daily
Where/how is it measured?	Finished water
What is the control point?	Soda ash dosing system

TARGET 7.4	ALERT ≤ 7.2 or ≥ 7.8	CRITICAL 1 ≤ 7.0 or ≥ 8.0
Check SCADA daily respond accordingly to all alarms Record all observations and monitoring results in plant diary Daily (if running): o Visual plant inspection o Manual sampling at finished water and testing for pH o Check soda ash dosing system, if running: ▪ Dosing point to ensure dosing is occurring ▪ Water hardness and ensure water softening system is working ▪ Leaks and blockages (soda ash and water softening units) Weekly: o Visual plant inspection o Calibrate pH meter o Perform drop tests and adjust dose as required o Alternate duty soda ash hoppers o Check level of soda ash and re-order if < 25%	Record all observations and monitoring results in plant diary ▪ Record all operational changes in plant diary Adjust soda ash Retest and wait for one day ▪ Seek assistance from supervisor ▪ Redo soda ash dosing system checks ▪ Undertake drop tests and adjust dose as required o Refer to past records for chemical dosage guide ▪ Perform jar testing and adjust dosing as required ▪ Re-calibrate pH meter ▪ Increase monitoring	▪ Notify: o General Manager o Supervisor and manager ▪ Repeat corrective actions from alert level ▪ Shut down plant ▪ Troubleshoot problem and implement corrective actions as appropriate

11.3.6 CCP5 Reservoir Integrity

What is being measured?	System integrity (monthly)
Where/how is it measured?	Visual inspection of the reservoirs
What is the control point?	Distribution reservoirs
What are the hazards?	Pathogens

TARGET Secure, no evidence of break or vermin	ALERT Visual identification of breach or vermin access to reservoir	CRITICAL Visual identification of vermin or contaminant in reservoir
▪ Monthly: o Visual inspection of reservoirs ▫ Check hatches, corrugation, fences, locks o Free chlorine testing at all reservoirs. If there is an unusually high chlorine demand, investigate further o Reservoir roof inspections	▪ Notify supervisor and workshop manager as per Goldenfields Water communication protocols ▪ If possible and safe to do so, take immediate action to rectify breach ▪ If unable to immediately repair, action is to be taken within two working days ▪ Check chlorine residual in reservoir and reticulation ▪ Perform bacto test in reservoir ▪ If chlorine residual in reservoir or reticulation is inadequate, consider manually adding chlorine ▪ Increase monitoring of chlorine residual in reservoir and reticulation until system conform	▪ Notify: o General Manager o Supervisor and manager o DPI Water o NSW Health as per Goldenfields Water communication protocols ▪ Repeat corrective actions from alert level ▪ If possible and safe to do so, take immediate action to remove contaminant ▪ Consider taking reservoir offline: o isolate and bypass tank (if possible) o empty tank o clean tank o fill and super chlorinate ▪ In consultation with NSW Health, consider the possibility of issuing a boil water alert ▪ Increase monitoring until system conforms

11.3.7 CCP6 Secondary Disinfection

What is being measured?	Free chlorine residual (online continuous, alarmed)
Where/how is it measured?	Prunevale Pump station and Cootamundra Depot
What is the control point?	Chlorine dosing system
What are the hazards?	Chlorine sensitive pathogens

TARGET 0.8 mg/L	ALERT ≤ 0.5 mg/L or ≥ 2.0 mg/L	CRITICAL ≤ 0.2 mg/L or ≥ 5.0 mg/L
Note: Secondary disinfection units located at Demondrille. The online analyser is located at Prunevale PS. These levels apply to the reading at the online analyser. ▪ Check SCADA daily and respond accordingly to all alarms ▪ Record all observations, monitoring results and free chlorine result in diary ▪ Weekly: o Manual free chlorine sampling and testing at secondary disinfection units and in reticulation o Calibrate online analysers at Prunevale PS and Cootamundra depot o Check chlorine dosing system: o Check for blockages, leaks (injector, head unit) o Check chemical storage levels (scales and spare tanks) o Check heater operational in chlorine dosing room ▪ Cross-check handheld and online chlorine analyser ▪ 1 - 3 times weekly manual free chlorine test in reticulation undertaken by distributions team	Record all observations and monitoring results in plant diary Record all operational changes in diary Seek assistance from supervisor Check pump run time. If pump has just started (running < 30 min): Wait for 30 min for free chlorine to increase. If pump has been running > 30 min: o Increase chlorine dosing and test free chlorine at sample points that have > 30 min chlorine contact time Repeat secondary chlorine dosing system checks	▪ Notify: o General Manager o Supervisor and manager o DPI Water o NSW Health if problem persists more than 24 hr and pumping needs to resume as per Goldenfields Water communication protocols ▪ Repeat corrective actions from alert level ▪ Manually dose reservoirs with chlorine ▪ Stop pumping ▪ Troubleshoot problem and implement corrective actions as appropriate o Investigate cause of low chlorine - from source or particular reservoirs? ▪ Increase monitoring of upstream and downstream free chlorine until system conform

11.4 Oura Critical Control Points

The critical parameters for the safe management of the Oura water supply system are shown below and should be displayed onsite.

Target Criteria	This is where you should be operating. Aim to keep the system operating at this value.
Adjustment Limit	If you reach this limit, refer to CCP management sheet and try to get back to the operational target. Increase monitoring until returned to normal.
Critical Limit	If you reach this limit, you have lost control of your system. Refer to CCP management sheet and try to return to operational target as a matter of urgency.

11.4.1 CCP1 Disinfection

What is being measured?	Free chlorine residual (daily)
Where/how is it measured?	Treated water, daily manual test
What is the control point?	Chlorine dosing system
What are the hazards?	Chlorine sensitive pathogens

TARGET 0.5 mg/L	ALERT ≤ 0.3 mg/L or ≥ 1.0 mg/L	CRITICAL ≤ 0.2 mg/L or ≥ 5.0 mg/L
▪ Daily chlorine residual test ▪ Record all observations and monitoring results in diary ▪ Daily (if running): o Check chlorine dosing system: ▫ Check for blockages, leaks (injector, head unit) ▫ Check chemical storage levels (scales and spare tanks) o Suspended solids (pad) test ▪ pH test 3 times weekly (treated and raw water) ▪ Weekly turbidity testing in reticulation ▪ Chlorine delivery every 3 weeks ▪ Monthly bacto sampling in reservoirs	▪ Record all observations and monitoring results in diary ▪ Record all operational changes in plant diary ▪ Redo chlorine dosing system checks ▪ Retest chlorine residual ▪ Review previous water quality data Seek assistance from supervisor ▪ In consultation with supervisor, consider: ▪ Manually topping up chlorine at reservoirs ▪ Adjusting flow rate ▪ Adjusting chlorine dose or feed point ▪ Sample for pH, turbidity, total and free chlorine monitoring along Junee pipeline and at Junee BT	▪ Notify: o General Manager o Supervisor and manager o DPI Water o NSW Health if ≤ 0.2 mg/L or > 5 mg/L as per Goldenfields Water communication protocols and water has been supplied ▪ Cease pumping ▪ Test free chlorine in: o Junee BT o Distribution pipelines to track flow of low residual water o Record all monitoring results ▪ Repeat corrective actions from alert level ▪ Increase chlorine dose at secondary disinfection units ▪ Troubleshoot problem and implement corrective actions as appropriate ▪ Increase monitoring ▪ Develop incident plan

11.4.2 CCP2 Fluoridation

What is being measured?	Fluoride (daily)
Where/how is it measured?	Treated water, daily manual test
What is the control point?	Fluoride dosing
What are the hazards?	Fluoride overdosing and underdosing

TARGET 1.0 mg/L	ALERT < 0.9 mg/L or > 1.2 mg/L	CRITICAL < 0.9 mg/L for > 72 hr or ≥ 1.5 mg/L
Daily fluoride test Record all observations and monitoring results in diary Daily (if running): o Visual plant inspection o Manual sampling and testing of raw water fluoride o Manual sampling and testing of treated water fluoride o Complete Form 3 o Check fluoride dosing system: ▫ Check for blockages, leaks ▫ Check chemical storage levels ▫ Check heater operational in fluoride dosing room Twice weekly fluoride testing in reticulation Monthly: o Perform drop test and adjust dose as required o Clean fluoride hopper	Record all observations and monitoring results in plant diary Record all operational changes in plant diary Seek assistance from supervisor Re-calibrate fluoride probe Re-test fluoride (raw and finished water) Check fluoride dosing system: o Check for blockages, leaks o Check for clumping in fluoride hopper o Check chemical storage levels o Check heater operational in fluoride dosing room Perform drop test and adjust dose as required Increase monitoring	Notify: o General Manager o Supervisor and manager o DPI Water o NSW Health as per Goldenfields Water communication protocols Shut down fluoride dosing system immediately Consider dumping fluoride tank and affected pipeline Follow NSW Health response protocol in the Code of Practice for the Fluoridation of Public Water Supplies Repeat corrective actions from alert level If ≥ 1.5 mg/L, notify bulk water councils as per Goldenfields Water communication protocols Troubleshoot problem and implement corrective actions as appropriate Increase monitoring

11.4.3 CCP3 Reservoir Integrity

What is being measured?	System integrity (monthly)
Where/how is it measured?	Visual inspection of the reservoirs
What is the control point?	Distribution reservoirs
What are the hazards?	Pathogens

TARGET	ALERT	CRITICAL
Secure, no evidence of break or vermin	**Visual identification of breach or vermin access to reservoir**	**Visual identification of vermin or contaminant in reservoir**
▪ Monthly: o Visual inspection of reservoirs ▫ Check hatches, corrugation, fences, locks o Free chlorine testing at all reservoirs. If there is an unusually high chlorine demand, investigate further o Reservoir roof inspections	▪ Notify supervisor and workshop manager ▪ If possible and safe to do so, take immediate action to rectify breach ▪ If unable to immediately repair, action is to be taken within two working days ▪ Check chlorine residual in reservoir and reticulation ▪ Perform bacto test in reservoir ▪ If chlorine residual in reservoir or reticulation is inadequate, consider manually adding chlorine ▪ Increase monitoring of chlorine residual in reservoir and reticulation	▪ Notify: o General Manager o Supervisor and manager o DPI Water o NSW Health as per Goldenfields Water communication protocols ▪ Repeat corrective actions from alert level ▪ If possible and safe to do so, take immediate action to remove contaminant ▪ Consider taking reservoir offline: o isolate and bypass tank (if possible) o empty tank o clean tank o fill and super chlorinate ▪ In consultation with NSW Health, consider the possibility of issuing a boil water alert ▪ Increase monitoring

11.4.4 CCP4 Secondary Disinfection

What is being measured?	Chlorine residual (weekly)
Where/how is it measured?	Wyalong and Thanowring, weekly manual test
What is the control point?	Secondary chlorine dosing system
What are the hazards?	Chlorine sensitive pathogens

TARGET 0.5 mg/L	ALERT ≤ 0.35 mg/L	CRITICAL ≤ 0.25 mg/L
▪ Test for chlorine residual ▪ Record all observations, monitoring results and free chlorine result in diary ▪ Weekly: o Manual free chlorine sampling and testing at secondary disinfection unit and in reticulation (flush line for 5 min prior to taking sample) o Check chlorine dosing system: ▫ Check for blockages, leaks (injector, head unit) ▫ Check chemical storage levels (spare tanks) ▫ Check heater operational in chlorine dosing room	Record all observations and monitoring results in diary Record all operational changes in diary Seek assistance from supervisor Redo chlorine dosing system checks Perform chlorine residual testing progressively along reticulation system to determine the extent of low residual water Perform pH, turbidity and total chlorine testing in reticulation	Notify: o General Manager o Supervisor and manager o DPI Water o NSW Health if < 0.2 mg/L or > 5 mg/L as per Goldenfields Water communication protocols Repeat corrective actions from alert level Manually dose reservoirs with chlorine until residual of 0.5 mg/L is detected in the reservoir Stop pumping Perform bacto test in reservoir if < 0.1 mg/L free chlorine In consultation with supervisor and manager, consider emptying, cleaning and refilling reservoir Troubleshoot problem and implement corrective actions as appropriate Increase monitoring free chlorine until system conforms

11.5 Mt Arthur Critical Control Points

The critical parameters for the safe management of the Mt Arthur water supply system are shown below and should be displayed onsite.

Target Criteria	This is where you should be operating. Aim to keep the system operating at this value.
Adjustment Limit	If you reach this limit, refer to CCP management sheet and try to get back to the operational target. Increase monitoring until returned to normal.
Critical Limit	If you reach this limit, you have lost control of your system. Refer to CCP management sheet and try to return to operational target as a matter of urgency.

11.5.1 CCP1 Disinfection

What is being measured?	Free chlorine residual (3 x weekly)
Where/how is it measured?	Tank 4 outlet
What is the control point?	Chlorine dosing system
What are the hazards?	Chlorine sensitive pathogens

TARGET 0.8 mg/L	ALERT ≤ 0.5 mg/L or ≥ 2.0 mg/L	CRITICAL ≤ 0.3 mg/L or ≥ 5.0 mg/L
▪ Test chlorine residual 3 x weekly ▪ Record all observations and monitoring results in diary ▪ 3 x Weekly: o Check chlorine dosing system: ▫ Check for blockages, leaks (injector, head unit) ▫ Check chemical storage levels (spare tanks) ▫ Check heater operational in chlorine dosing room o Manual chlorine residual testing in reticulation ▪ Chlorine delivery	▪ Record all observations and monitoring results in monthly testing report ▪ Record all operational changes in plant diary ▪ Seek assistance from supervisor ▪ Cease pumping until system conforms ▪ Check chlorine dosing system: o Check for blockages, leaks (injector, head unit) o Check chemical storage levels (spare tanks) o Check heater operational in chlorine dosing room o Adjust flow rate, dose rate or feed point o Perform pH, turbidity, total and free chlorine testing in reticulation o Increase monitoring	▪ Notify: o General Manager o Supervisor and manager o DPI Water o NSW Health if ≤ 0.2 mg/L or > 5 mg/L if water supplied as per Goldenfields Water communication protocols ▪ Cease pumping until system conforms ▪ Manually dose reservoirs with chlorine until residual of 0.5 mg/L is detected in the reservoir ▪ Perform bacto test in reservoir if < 0.1 mg/L free chlorine ▪ Repeat corrective actions from alert level ▪ Troubleshoot problem and implement corrective actions as appropriate ▪ Increase monitoring

11.5.2 CCP2 Reservoir Integrity

What is being measured?	System integrity (monthly)
Where/how is it measured?	Visual inspection of the reservoirs
What is the control point?	Distribution reservoirs
What are the hazards?	Pathogens

TARGET	ALERT	CRITICAL
Secure, no evidence of break or vermin	**Visual identification of breach or vermin access to reservoir**	**Visual identification of vermin or contaminant in reservoir**
▪ Monthly: o Visual inspection of reservoirs ▫ Check hatches, corrugation, fences, locks o Free chlorine testing at all reservoirs. If there is an unusually high chlorine demand, investigate further o Reservoir roof inspections	▪ Notify supervisor and workshop manager as per Goldenfields Water communication protocols ▪ If possible and safe to do so, take immediate action to rectify breach ▪ If unable to immediately repair, action is to be taken within two working days ▪ Check chlorine residual in reservoir and reticulation ▪ Perform bacto test in reservoir ▪ If chlorine residual in reservoir or reticulation is inadequate, consider manually adding chlorine ▪ Increase monitoring of chlorine residual in reservoir and reticulation	▪ Notify: o General Manager o Supervisor and manager o DPI Water o NSW Health as per Goldenfields Water communication protocols ▪ Repeat corrective actions from alert level ▪ If possible and safe to do so, take immediate action to remove contaminant ▪ Consider taking reservoir offline: o isolate and bypass tank (if possible) o empty tank o clean tank o fill and super chlorinate ▪ In consultation with NSW Health, consider the possibility of issuing a boil water alert ▪ Increase monitoring

11.6 Mt Daylight Critical Control Points

The critical parameters for the safe management of the Mt Daylight water supply system are shown below and should be displayed onsite.

Target Criteria	This is where you should be operating. Aim to keep the system operating at this value.
Adjustment Limit	If you reach this limit, refer to CCP management sheet and try to get back to the operational target. Increase monitoring until returned to normal.
Critical Limit	If you reach this limit, you have lost control of your system. Refer to CCP management sheet and try to return to operational target as a matter of urgency.

11.6.1 CCP1 Disinfection

What is being measured?	Free chlorine residual (continuous online)
Where/how is it measured?	Naradhan Reservoir
What is the control point?	Chlorine dosing system
What are the hazards?	Chlorine sensitive pathogens

TARGET 0.8 mg/L	ALERT ≤ 0.5 mg/L or ≥ 2.0 mg/L	CRITICAL ≤ 0.3 mg/L or ≥ 5.0 mg/L
▪ Check SDADA daily and respond accordingly to all alarms ▪ Record all observations and monitoring results in diary ▪ Weekly: o Check chlorine dosing system: ▫ Check for blockages, leaks (injector, head unit) ▫ Check chemical storage levels (spare tanks) ▫ Check heater operational in chlorine dosing room ▫ Cross-check hand held and online chlorine analysers o Calibrate online chlorine analyser o Manual chlorine residual testing in reticulation ▪ Chlorine delivery ▪ Monthly bacto sampling in reservoirs	▪ Record all observations and monitoring results in diary ▪ Record all operational changes in plant diary ▪ Duty operator will be notified by telemetry if alert limit is reached o Duty officer to respond to alarm as soon as practicable ▪ Seek assistance from supervisor ▪ Cease pumping until system conforms ▪ Check chlorine dosing system: o Check for blockages, leaks (injector, head unit) o Check chemical storage levels (scales and spare tanks) o Check heater operational in chlorine dosing room o Cross-check handheld and online chlorine analysers o Adjust flow rate dose rate or feed point	▪ Notify: o General Manager o Supervisor and manager o DPI Water o NSW Health if problem persists and pumping needs to resume as per Goldenfields Water communication protocols ▪ Cease pumping if water storage level is sufficient ▪ Manually dose reservoirs with chlorine until residual of 0.5 mg/L is detected in the reservoir ▪ Perform free chlorine and bacto test in reservoir ▪ Repeat corrective actions from alert level ▪ Troubleshoot problem and implement corrective actions as appropriate ▪ Increase monitoring

11.6.2 Reservoir Integrity

What is being measured?	System integrity (monthly)
Where/how is it measured?	Visual inspection of the reservoirs
What is the control point?	Distribution reservoirs
What are the hazards?	Pathogens

TARGET	ALERT	CRITICAL
Secure, no evidence of break or vermin	**Visual identification of breach or vermin access to reservoir**	**Visual identification of vermin or contaminant in reservoir**
▪ Monthly: o Visual inspection of reservoirs ▫ Check hatches, corrugation, fences, locks o Free chlorine testing at all reservoirs. If there is an unusually high chlorine demand, investigate further o Reservoir roof inspections	▪ Notify supervisor and workshop manager as per Goldenfields Water communication protocols ▪ If possible and safe to do so, take immediate action to rectify breach ▪ If unable to immediately repair, action is to be taken within two working days ▪ Check chlorine residual in reservoir and reticulation ▪ Perform bacto test in reservoir ▪ If chlorine residual in reservoir or reticulation is inadequate, consider manually adding chlorine ▪ Increase monitoring of chlorine residual in reservoir and reticulation	▪ Notify: o General Manager o Supervisor and manager o DPI Water o NSW Health as per Goldenfields Water communication protocols ▪ Repeat corrective actions from alert level ▪ If possible and safe to do so, take immediate action to remove contaminant ▪ Consider taking reservoir offline: o isolate and bypass tank (if possible) o empty tank o clean tank o fill and super chlorinate ▪ In consultation with NSW Health, consider the possibility of issuing a boil water alert ▪ Increase monitoring

12 APPENDIX C ACTION AND IMPROVEMENT PLAN

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No.	Action	Type	Status	Date completed/ closed	Comments	Priority	Responsibility	Action reference
1	GWCC to consider installing an online free chlorine analyser at Oura disinfection point (after 30 min contact time).	Capital works	Complete		25/11/2016 - 9 analysers purchased. As Oura is not disinfecting for primary kill, the analyser should be located as close as practical to the disinfection point. 15/10/2019 - Blueeye analyser installed; however has been found to be unreliable. Analyser has not be implemented for control however is registering trends. A new Burket system will now be installed as a replacement. 1/9/2021 - Burkert Analyser has been installed and operating since early 2020	Very High	Manger Production and Services	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
2	GWCC to consider training staff in backflow prevention	Training	Complete	Sep-16				GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
3	GWCC to consider conducting internal training	Training	Complete	2017				GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

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	on chlorine residual testing							
4	GWCC to conduct internal training (or refresher training) on correct sampling techniques	Training	Complete	2017	25/11/2016 - Register needs to be updated to capture internal training completed 15/10/2019 - All Water Qual staff have been inducted into proper sampling techniques; however a role out of all staff across the organisation whom may require sampling as part of their role will need to be undertaken. 25/8/2020 All new distribution staff inducted internally however; a register is yet to be developed. 1/9/2021 - all compliance sampling is conducted by Water Quality Staff now who are trained and specialised. The only testing that occurs from distribution staff is now just chlorine operational samples. Water Quality Staff continue development and all maintain their cert 3 in	Low		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

					water treatment plant operations.		
5	GWCC to consider conducting a community education program on backflow prevention	Community engagement	Closed	25-Nov	25/11/2016 - Action closed due to changed process. Refer to action 33 (implement backflow prevention program)		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
6	GWCC to conduct bacto sampling after storm event if visual check of bores show signs of being compromised	Monitoring	Closed	25-Nov	25/11/2016 - Action closed due to changed process. Refer to action 33 (implement backflow prevention program)		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

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7	GWCC to install an online turbidity meter in Murrumbidgee River to predict water quality decline	Capital works	Closed	Nov-16	25/11/2016 - Turbidity meter purchased. However this action is no longer required. Controls for WTP are established at the plant through the upgrade to ClearScada control system. Raw water turbiditity is already measured and shuts the plant down if variation >20% occurs. Contact with WaterNSW will also provide any release changes that may impact on river turbidity.		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
8	GWCC to roll out system of different levels of key access to increase security	Operations and maintenance	Complete	2016	25/11/2016 - Keys purchased 25/8/2020, majority of all sites now completed with only remote site remaining		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
9	GWCC to consider performing preventative maintenance on solenoid valves leading into fluoride batching tank	Operations and maintenance	Closed	Nov	25/11/2016 - Considered as part of maintenance		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

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10	GWCC to check data entry to ensure no errors and record all incidents and causes of high readings (e.g. data entry error, human error, etc.)	Monitoring	Closed	2017	the implementation of a new water quality database (Wateroutlook) has allowed for the centralisation of all test results and automated reporting for any non-conformances.		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
11	GWCC to consider purchasing electronic chlorine analyser to eliminate manganese interference with chlorine residual testing as per DPI Water recommendation (e.g. chloro-sense kits)	Capital works	Closed	2014	25/11/2016 - One at Jugiong and one at Oura		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
12	GWCC to consider increasing monitoring of chlorine residual throughout system during power outages	Monitoring	Closed	25-Nov	25/11/2016 - Covered within incident management. 9 chlorine analysers to be installed 15/10/2019 - multiple sites now online via SCADA with battery backup operations.		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

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13	GWCC to consider installing online chlorine analysers at Oura PS	Capital works	Closed	25/11/2016 - analyser purchased. Currently being installed and connected to SCADA 2017. 15/10/2019 - Analyser installed in lab. Reliability of the Blueeye unit is not good and a new unit will be installed in 2019. System is currently operating however no controls have been engaged from the analyser due to reliability f the unit. Trends are however being obtained. 1/9/2021 works were complete and commissioned in early 2020		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

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14	GWCC to develop a register for water carters	Procedures and documentation	Closed		2017 - Letters issued to all known water carters within supply area. No responses received from water caters regarding potable water services. Process will be controlled greater via the installation of automated filling stations which will be delivered as an ongoing capital delivery project. 15/10/2019 - Filling stations installed at Temora, Bardmedman and West Wyalong. No commercial water carters for potable services have been registered.			GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
15	GWCC to develop and maintain a register of RPZs within distribution system	Procedures and documentation	Closed		To be completed as part of *Action33 Implement backflow prevention program*			GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
16	GWCC to consider and investigate and install the most suitable BFPD on the connection	Capital works	Complete		2017 risk assesment and report developed on the non-pot system and its potential for cross contamination. Further projects to progress to	High	Manager Engineering	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

	between Oura and Hylands Bridge (e.g. RPZ, break tank with air gap, etc.)			investigation stage in 2018. 15/10/2019 - Works still outstanding 25/8/2020 Works still outstanding 1/1/2022 A stop valve and non-return valve has been put in place to reduce any risk of backflow		
17	GWCC to ensure all hatches on reservoirs comply with AS/NZS	Operations and maintenance	Rolled into other action	To be completed as part of *Action 36 To complete and submit circular 18*		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
18	GWCC to implement a formal water quality monitoring regime at Mt Arthur to monitor pH, turbidity, free, and total chlorine	Monitoring	Rolled into other action	To be completed as part of *Action 37 Complete formal review of monitoring plan, against ADWG, NSW Health*		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
19	GWCC to implement a formal water quality monitoring regime at Mt Daylight to monitor pH,	Monitoring	Rolled into other action	To be completed as part of *Action 37 Complete formal review of monitoring plan, against ADWG, NSW Health*		GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

	turbidity, free, and total chlorine				
20	GWCC to install a backflow prevention device between the GWCC reservoir and the reservoir managed by Carathool Shire Council to protect water quality in the Mt Daylight drinking water supply	Capital works	Closed	25/11/2016 - Part of broader discussion on governance with Carathool Shire Council 25/8/2020 there is an airgap between water in reservoir and inlet therefore restricting any backflow	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
21	GWCC to consider purging reservoir as part of emergency response if contamination is suspected	Operations and maintenance	Closed	25/11/2016 - Considered as part of emergency procedures	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
22	GWCC to consider alarming all reservoir hatch doors in case of sabotage or vandalism. Mt Daylight reservoir is a	Operations and maintenance	Closed	25/11/2016 - Been considered, but currently not practical. Managed with weekly and quarterly inspections.	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

	priority, which is the most remote							
23	GWCC to complete live chlorine monitoring system for reticulation system (in progress)	Capital works	Complete		25/11/2016 - analyser purchased 15/10/2019 - analysers will be installed on demarcation boundaries for Bulk customers retics. No considerations for online retic monitoring is being considered at this stage as water quality team are building data to inform future decisions such as apporpriate locailities that warrant online monitoring. 25/8/2020 as per previous note on 15/10/2019 - 1/9/2021 as per previous advice and note that staff undertake significant amount of additional operational testing for the retic systems.	Low	Manager Production & Services	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

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24	GWCC to consider developing SOP for fluoride hopper cleaning	Procedures and documentation	Complete		15/10/2019 - External training consultant required to facilitate, training and development of an SOP for Trades. This will occur upon completion of the new Code of Practice. 25/8/2020 SOP has been drafted and induction to be provided for all trades and WTP operators - 1/9/2021 new induction procedure was completed and implemented in 2020	Very High	Manager Production & Services	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
25	GWCC to consider developing SOPs for chlorine testing to include manganese interference with reagent	Procedures and documentation	Closed	30/06/2019	15/10/2019 - consideration of developing SOP's has been determined as not required.			GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
26	GWCC to develop SOPs for operational and supporting activities, such as plant operation, mains break repair,	Procedures and documentation	Complete		15/10/2019 - SOPS for WTP's and Water Quality division have been completed. Distribution SOP's now required in line with relevant training 25/8/2020 distribution	Medium	Manager Operations	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

	mains flushing, etc.				staff to develop SOPS for their activities e.g. mains breaks - 1/9/2021 GWCC have now established a WHS committee and officers, continual improvement processes are in place and managed as part of this process. This includes all WHS documentation and SOP needs for the organisation			
27	GWCC to include drinking water quality management in the annual report, as recommended in Element 10 of the ADWG	Procedures and documentation	Complete	2018	First report and submitted in October 2018.			GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)
28	Educate community member that owns the private bore in close proximity to Oura Borefield to ensure they are aware that the bore accesses the	Community engagement	Complete	30/06/2020	25/11/2016 - Refer to new action 38	High	Manager Engineering	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

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	drinking water aquifer							
29	GWCC to consider installing online chlorine residual analyser at outlet of settling tanks to ensure 30 minutes contact time (Mt Arthur system)	Capital works	In progress		25/11/2016 - Analyser purchased. Unit has been installed at Ganmain; however just waiting on connection for discharge water to sewer before commissioning occurs. 15/10/2019 - Analysers and Maglows to be installed in the Mt Arthur System to provide more data for potential treatment requirements. Investigations to Occur from January 2020 as part of MIPPS student placement. -25/8/2020 MIPPS student investigation project complete June 2020, further investigations in treatment options to occur - 1/9/2021 magflow and analysers installed however not connected to clearscada system.	Low	Manager Production & Services	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

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					- 1/11/2022 Mt Arthur SCADA/Telemetry network to commence upgrade in 2022/23 financial year. Connection of water quality instrumentation to be completed after this.			
30	GWCC to consider changing location of online chlorine analyser in the Mt Daylight system to ensure free chlorine measurement after 30 min contact time. Both the chlorine dosing and the chlorine analyser are located at the reservoir inlet	Capital works	Closed	30/06/2020	Consider as part of analyser installation. 15/10/2019 - Analyser installed at Naradhan Res's providing residual levels 15km down stream of dosing point. Anlayser needs to include controls to inhibit Daylight pumps if residuals or CL2 dosing stops.	Medium	Manager Production & Services	GWCC DWMS Technical Note 2 Risk Assessment and Critical Control Point Workshop (HydroScience, 2015)

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31	Determine the level of water quality training required for new staff and add to induction program	Training	Complete		15/10/2019 - Consideration of training will need to be developed in accordance with each individuals role. However in terms of induction and competancy based requirements for all field staff, this needs to be developed. 25/8/2020 all new starter within WQ and distribution teams have been provided relevent inductions where required however formal register yet to be developed. - 1/9/2021 water quality staff now managing all compliance requirements of the DWMS. Their training is being developed in line with the National Training Package 2020. We are working with the NSW Water Directorate and TWRRP Team for access to new training providers which has delayed our continual	Medium	Human Resource Coordinator	Added as part of action and improvement plan review (25 November 2016)

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				development requirements. Staff undertake a review of their Staff Development Plans every 6 months			
32	Develop and implement competency checklist/schedule on sampling methodology	Training	Closed	30/06/2020	15/10/2019 - Will be considered as part of an induction and training program for water quality testing. Internally competency sign off required 25/8/2020 has been considered and will form part of induction process and register - 1/9/2021 All compliance sampling conducted by Quality staff now whom hold a minimum of cert 3 in water treatment operations.	Low	Manager Production & Services	Added as part of action and improvement plan review (25 November 2016)

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33	Implement backflow prevention program, including developing register of RPZs	Capital works	Closed	30/06/2020	25/11/2016 - Budget approved, project underway. 15/10/2019 - Program has commenced and is nearing its completion for all rural high risk connections.25/8/2020 RPZD register of high risk connections has been completed	Very High	Manager Engineering	Added as part of action and improvement plan review (25 November 2016)
34	Develop a microbiological sampling SOP when bore head integrity has been potentially compromised (maintenance, flooding, vandalism)	Procedures and documentation	Closed	30/06/2019	15/10/2019 - in line with action item 6 above. Emergancy Response SOP's have been developed. Routine raw water testing now undertaken.			Added as part of action and improvement plan review (25 November 2016)
35	Investigate options for electronic card systems on standpipes to record water carter access	Capital works	Closed	30/06/2019	Temora and West Wyalong have been determined as priority locations for installation during the 18/19 financial year. 15/10/2019 - West Wyalong, Temora and Barmedman now installed and operational.			Added as part of action and improvement plan review (25 November 2016)

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36	To complete and submit circular 18	Operations and maintenance	Complete		The development of routine inspections and standard operating procedures have been completed in 2017. Work on the development of a centralised database that can issue out work orders and retain asset corrective action data is now being developed through Wateroutlook. 15/10/2019 - formal submission Circular 18 has not recieved any feedback from 2017. Consideration of new submission to be made. 25/8/2020 No change still no feedback from DPIE	High	Manager Engineering	Added as part of action and improvement plan review (25 November 2016)
37	Complete formal review of monitoring plan, against ADWG, NSW Health	Monitoring	Complete	2017	Works completed with independent review completed by Atom consulting in 2017. 15/10/2019 - Annual DWMS review is undertaken in October of every year and reported to NSW Health upon completion.			Added as part of action and improvement plan review (25 November 2016)

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38	Investigate bore 5 private ownership and licensing, in liaison with DPI Water. Considering water quality contamination risks from bore	Investigative studies	Closed	30/06/2019	15/10/2019 - contact with Land Holder and DOI Water to occur 25/8/2020 no indication of active bore, GWCC to continue to monitor raw water of existing borefield	High	Manager Engineering	Added as part of action and improvement plan review (25 November 2016)
39	Ensure bore 1 wellhead security e.g. secure gaps in casement	Capital works	Closed	2019	contact with land holder to gain access and investigate bore closure to occur in 2018 15/10/2019 - 100% confirmation is not possible. Continued monitoring of our borefield raw water will identify any issues if such shall arise.			Added as part of action and improvement plan review (25 November 2016)
40	Review operational monitoring data	Monitoring	Complete	ongoing	Independent monitoring report completed by Atom Consulting with internal review also undertaken for development of better operational data gathering for population of Wateroutlook system.			Added as part of action and improvement plan review (25 November 2016)
41	Formulate a Drinking Water Quality Policy	Procedures and documentation	Closed	2018	Formulate a drinking Water Policy, to be completed before		Manger Production and Services	Added as part of review/development of DWMS

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					August council meeting. 15/10/2019 - now complete		
42	Ensure Drinking Water Quality policy is communicated and understood by staff	Training	Closed	2018	Once policy has been adopted by council it is to communicated and understood by staff 15/10/2019 - all policies are submitted to the Consultative Committee for review and made available online for all staff.	Manger Production and Services	Added as part of review/development of DWMS
43	construct Flow diagrams of water supply system from catchment to consumer	Procedures and documentation	Complete	2017	flow diagrams were updated to be placed into DWMS		
44	Assemble pertinent information and document key characteristics of the water supply system	Procedures and documentation	Complete	2017	Information was generated for production of DWMS	Manger Production and Services	
45	Assemble a team with appropriate knowledge and expertise	Procedures and documentation	Closed	2019	Asset management asset required. 15/10/2019 - Water Quality team now established with more room to grow trainees in future years. Engineering team has	Manger Production and Services	

					gone from 3 to 5 staff with an independant manager.	
46	Identify existing preventive measures from catchment to consumer for each significant hazard or hazardous event and estimate the residual risk	Investigative studies	Complete	ongoing	Ongoing risk reviews and actions are undertaken upon incident reporting/lessons learnt scenarios. As the organisations asset and operational maturity increases so to will the levels of assessment and outcomes. - 1/9/2021 GWCC staff monitor and maintain its raw water systems via monthly monitoring lab results. In addition to that we are altered by any changes to Murrumbidgee discharges from Water NSW.	Low
47	Evaluate alternative or additional preventive measures where improvement is required		Closed	ongoing	25/8/2020 as per item 46 above	

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48	Document all procedures and compile into an operations manual	Procedures and documentation	Closed	2019	SOPs have been generated and reviewed; they will need to be finalised. SWMS are currently being developed 15/10/2019 - All SOP's for WTP operations have now been complete. All documents have been made available on WaterOutlook. An operations manual is not deemed required at this stage.		Manger Production and Services
49	Identify procedures required for processes and activities from catchment to consumer	Procedures and documentation	Complete		See point 48 above. 15/10/2019 - This needs to be investigated and developed into a management plan for each supply scheme. - 1/9/2021 this is documented and managed as part of our DWMS and associated annual reviews.	Medium	Manger Production and Services

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50	Ensure monitoring data is representative and reliable	Monitoring	Complete	ongoing	Ongoing data auditing every 12 months will help confirm data is representative of water supplies. 15/10/2019 - Wateroutlook provides monthly data reports for review by the water quality team. All data is reviewed annually for consideration of any new improvements required for data and operational consistency.	Manger Production and Services
51	Determine the characteristics to be monitored in the distribution system and in water as supplied to the customer	Monitoring	Complete	2017	monitoring is carried out as per NSW Health drinking water Monitoring Program and operational requirements of GWCC.	
52	Establish and document a sampling plan for each characteristic, including the location and frequency of sampling	Monitoring	Complete	2017	Monitoring program to be audited every 12 months to ensure data is representative of the drinking water system	

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53	Establish a consumer complaint and response program, including appropriate training of employee	Community engagement	Complete	2017	A register of customer complaints and outcomes and feedback to be developed. 15/10/2019 - CRM processes and indicators to be developed over the next 12 months with data recording and reporting mechanisms to be developed as well. This is an outstanding item in both Internal audit and NPR Audit. 25/8/2020 Draft operating procedure for complaints handling completed - 1/9/2020 process is now business as usual with utilisation of councils customer service complaints system utilised to log and report on issues	Medium	Manger Production and Services
54	Define communication protocols with the involvement of relevent agencies and prepare a contact list of key people,	Procedures and documentation	Closed	2018	A register of contacts has been completed and Emergency Response Management Plan will need to be reviewed to add the list. 15/10/2019 - works now complete and reviewed annually.		

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	agencies and businesses						
55	develop a public and media communuications strategy	Community engagement	Complete	2019	See Ryan for update. 15/10/2019 - complete		
56	Develop mechanisms and communication procedures to increase employees awareness of and participation in drinking water quality management	Procedures and documentation	Complete		Suggested by GM to have all staff trained in Cert II Water Operations. 15/10/2019 - induction based training should be undertaken by operational staff. Discussions with HR Coordinator to occur to develop long term plan. - 1/9/2021 GWCC issue relevant update emails, SOP's and guidelines to all staff when changes occur. Additional training including scenario training is undertaken as well. Scenario training was conducted with Bulk Councils involved in late 2020.	High	Manger Production and Services

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57	Develop a comprehensive strategy for community consultation	Community engagement	Closed	2019	Have communications officer develop comms strategy. 15/10/2019 - Complete		
58	Assess requirements for effective community involvement	Community engagement	Complete	2019	15/10/2019 - As per Local Government Act, IP&R Framework and the Best Practice requirements for Water & Sewer.		
59	Use information to improve management of the Water Supply system	Investigative studies	Implemented	ongoing	Information will help GWCC to evolve with the requirements of its customers	Low	Manger Production and Services
60	establish programs to increase understanding of the water supply system	Community engagement	Complete	ongoing	Programs may include education of water quality, treatment processes, distribution works, new capital works etc - 1/9/2021 GWCC continue to develop hydraulic models, P&ID, and validation systems for Councils networks. Council have also developed and undertaken an education program called "Depth Days" which provides tours of Jugiong WTP and gives	Medium	Manger Production and Services

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					an overview of catchment to tap process for students and/or community groups if requested.	
61	Validate processes and procedures to ensure that they are effective at controlling hazards	Procedures and documentation	Implemented		Ongoing assessment current procedures will help produce and highlight the need for new or additional processes or information	
62	Revalidate processes periodically or when variations in conditions occur	Procedures and documentation	Implemented		See Action and Improvement Plan Action item 61 above	
63	Validate the selection and design of new equipment and infrastructure to ensure continuing reliability	Investigative studies	Implemented	2017	Ongoing	
64	Periodically review documentation and revise as nessesary	Procedures and documentation	Implemented	2017	Ongoing document will be review and updated as per the document review dates	

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65	develop a document control system to ensure current versions are in use	Procedures and documentation	Complete		Systematic approach with all review documents and their respective review dates to be determined and a suitable timeline developed to make sure all docs are updated as required 25/8/2020 all systems built into Water Outlook	High	Manger Production and Services
66	Establish a records management system and ensure that employees are trained to fill out records	Procedures and documentation	Implemented	2018	Wateroutlook is being developed by Safe group with a number of avenues of data collection to be made available once fully rolled out. 15/10/2019 - Additional CRM system is available for registering all documents, emails and correspondence		Manger Production and Services
67	Document information pertinent to all aspects of drinking water quality mangement	Procedures and documentation	Implemented		This will evolve as GWCC move forward, relevant information e.g. reservoir inspection sheets to be entered into a database for reporting and so that any works can be followed up on and actioned if not complete	Very High	Manger Production and Services

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68	produce an annual report to be made available to customers, regulatory authorities and stakeholders	Procedures and documentation	Implemented		DWMS Report may be made available once Water Quality Technical Officer has completed in July/August. 15/10/2019 - The annual report will be completed, submitted, and made available to all relevant authorities in October of every year.	High	Manger Production and Services
69	establish procedures for effective internal and external reporting	Procedures and documentation	Closed	2017	The DWMS annual report to NSW Health will but completed for the first time by GWCC and the annual performance report will also be undertaken by GWCC staff as usual on an annual basis		
70	Document and report results	Monitoring	Complete	2017	This will an evolving and ongoing		
71	Collect and evaluate longterm data to assess performance and identify problems	Monitoring	Complete	2017	This will an evolving and ongoing		
72	Document and communicate audit results	Monitoring	Complete	2017	Audit results are always documented and communicated so that any issues can be attended to or so that		

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					good results are communicated for good reason			
73	Establish processes for internal and external audits	Procedures and documentation	Complete	2019	15/10/2019 - Internal Audit undertaken this year and should be completed every 3 years. Consideration of external audits should be undertaken at least every 5 years.			
74	Evaluate the need for change	Investigative studies	Closed	ongoing				
75	Senior Executive review of the effectiveness of the management system	Investigative studies	Complete		15/10/2019 - Manex to review the Annual report and provide advice on any required changes. 25/8/2020 MANEX and council review annual report			
76	Bulk User Service Level Agreement	Procedures and documentation	In Progress	Ongoing	Formal Service level agreement be developed and implemented for councils' bulk water users; and b) This action be included into action and improvement plan within DWMS 25/8/2020 Funding has been awarded for the facilitation and development of WQ SLA between GWCC- Hilltops	Medium	Manager production and Services	Part B has been added to action and improvements plan (Oct 2019); PART A is in progress, Staff have submitted a request to Public Health for the engagement of an external facilitator to undertake the development of a new Service Level Agreement between GWCC and its Bulk Customers. Project to commence upon approval from Public Health for funding of the Consultant.

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					and GWCC and Coota Gundagai - 1/9/2021 Water Qual component has been completed and a draft is currently being developed by Lindsay Taylor Lawyers. - 1/11/22 draft SLA completed and currently under review. Change in staff at bulk councils has made it difficult to resolve outstanding items for agreement.			
77	Complaints Mangement System	Procedures and documentation	Implemented	Ongoing	Investigate options for a complaint handling system that integrates with Council's Asset Management and GIS Systems, and meets the requirements of the framework for the management of drinking water and Council's performance.	Medium	Manager production and Services	Management is unaware if a fully integrated complaints management system exists that could be implemented within GWCC cost effectively. However, Management will seek to improve its current capture of complaints through a more secure reporting system. This could be undertaken through tools such as Civica or WaterOutlook

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78	Emergency response traiing	Training	Complete	ongoing	Incident and emergency response training to be developed and referred to in DWMS and undertaken by relevant employees and stakeholders. (To be Included in DWMS) 25/8/2020 - Health have funded the facilitation of Emergency response training including bulk councils to occur 2020/21 - 1/9/2020 GWCC and Hilltops and CGRC all participated within a scenario training workshop held late 2020 at Jugiong WTP. Council also has developed Incident Protocols for water quality incidents that are to be used for management.	Medium	Manager production and Services	Managemet have issued a request for this scenario training to be funded and facilitated through Public Health. If funding and facilitated by Health GWCC will seek to undertake the training as soon as practicably possible. It should be noted that internal training is undertaken annualy for emergancy reponse maement at the Jugiong Water Treatment Plant as part of Council's Pollution Incident Response Management Plan. (HAS been included into DWMS under Traing)
79	Backflow Prevention	Procedures and documentation	Complete	2019	a) The Backflow Prevention Policy be referred to within the Drinking Water Management System; (COMPLETE under section Rural Backflow Prevention Program) and b) Backflow	Medium	Manager production and Services	Staff will include Backflow Prevention commentary within the DWMS Annual Report which is set to be completed and submitted to Council by December 2019.

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					device register be updated as required in accordance with the Backflow Prevention Policy (PP06). (Kevin will need to familiarise himself with this)			
80	Water Quality reporting	Procedures and documentation	Complete	2019	Consideration be given to making water quality information publicly available. For example, through the formal reporting to Council meetings, and/or making the DWMS Annual Reporting information available on Council's website.	Low	Manager Production and Services	Staff will submit the Annual DWMS Report to Council for acknowledgment between October and December every year. (Report will be submitted to December Council meeting and subsequently displayed on the public website for the public to see
81	Drinking Water Management System review	Procedures and documentation	Closed	30/06/2020	a) Following the annual review, the Drinking Water Management System be updated to reflect any changes that have been made; and b) Evidence of any review be retained such as meeting minutes, investigative studies, and reports to Council's Senior Management Team and/or Board Members.	low	Manager production and Services	As above

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82	Evaluation and audit	Procedures and documentation	Complete	2019	a) Consult with the Local Public Health Unit to clarify their expectations regarding independent audit requirements; and b) Detail the scope and frequency of the independent audit of the Drinking Water Management System (DWMS) in the DWMS.	Low	Manager production and Services	Management are constantly engaged with Public Health and have formally requested a recommendation for a fixed auditing period. No fixed period has been provided, with feedback stating that a requirement for an independent and external audit will be required when Health direct GWCC to do so.

13 APPENDIX D JUGIONG WATER SUPPLY SYSTEM

13.1 Version Control

Document Status:	Issued			
Document History:	**Status**	**Author**	**Version**	**Date**
	Included within 2015 DWMS	HydoScience	Version 1.0	November 2015
	Issued	Atom Consulting	Version 2.0	March 2017
	Reviewed and Updated	Chris Breen		November 2022
Current version authors:	Natalie Crawford (Atom Consulting), Annalisa Contos (Atom Consulting)			
Contact:	Annalisa Contos Atom Consulting 65 Cambourne Avenue annalisa@atomconsulting.com.au			
File Name:	GWCC_Jugiong Water Supply System_v2.0.docx			

13.2 Amendment Summary

A summary of the changes made to the document is shown in **Table 13-1**.

Table 13-1. Summary of changes

Version	Date	CCPs
Version 2.0	March 2017	Process flow diagram updated following October 2016 site visit
		Water supply system information split into individual water supply system from November 2015 DWMS

13.3 Description

The Jugiong drinking water supply system is one of the largest water supply systems managed by Goldenfields Water. The majority of water produced in the Jugiong system supplies the bulk water Councils of Cootamundra, Harden and Young. Water is also delivered to a small number of retail customers in rural properties and the villages of Stockinbingal, Wallendbeen and Springdale. Approximately 18,000 people are supplied water from the Jugiong system.

13.4 Murrumbidgee River

Raw water for the Jugiong drinking water supply system is sourced from the Murrumbidgee River. Water is extracted adjacent to the town of Jugiong, which is located downstream of Burrinjuck Dam and upstream of the confluence with Tumut River. The majority of land within the Murrumbidgee catchment area is primarily used for grazing, with the exception of the Burrinjuck Dam catchment, which is composed of conservation and forestry practices. High risks from the catchments with the potential to introduce pathogenic micro-organisms into the water supply have been identified as:

- STP overflows, on site sewerage management systems in Jugiong township
- Flooding events, storm water flows, and high river events increasing turbidity in source, including water released from Burrinjuck Dam
- Unrestricted livestock and/or wildlife access to water supply catchment
- Rapid changes in raw water quality when water is extracted from different levels of Burrinjuck Dam

Multiple planning tools such as Local Environment Plans (LEPs) and communication with WaterNSW who control Burrinjuck Dam exist as a preventative measure. Goldenfields Water also has a raw water turbidity meter that can initiate a plant shut down based on a rapid rise in turbidity.

13.5 Source Water

Goldenfields Water is licenced to extract water from the Murrumbidgee River via two submersible pumps operated in a duty / stand-by configuration. The submersible pumps are fixed speed; pump 1 operates at 190 L/s and pump 2 operates at 290 L/s. The Murrumbidgee River extraction point is shown in Figure 4-1 and Figure 4.2

Figure 4.1 Murrumbidgee River Extraction Point

***Source**: Atom Consulting, taken October 2016*

Figure 4.2 Murrumbidgee River Extraction Point

***Source**: Atom Consulting, taken October 2016*

13.6 Water Treatment Process

The Jugiong Water Treatment Plant (WTP) is located on Waterworks Road in the township of Jugiong. The plant is a conventional WTP with a nominal capacity of 40 ML/day.

The treatment process at Jugiong WTP comprises of the following process steps:

- Water from the Murrumbidgee River is pumped via 120 m rising main to Jugiong WTP (capacity 40 ML/day) by two pumps in a duty/standby configuration
- Water passes through a flow meter, where a flow of greater than 101 L/s starts the chlorine and soda ash pre-dosing systems for oxidisation of metals and pH adjustment, respectively. The chlorine pre-dose is optional, and is switched on or off by the operator, depending on water quality conditions
- The pre-dosed water enters the rapid mix tank which consists of baffles and two mixers in series. Polymer and aluminium sulphate are dosed into the rapid mix tank to aid flocculation
- Water then flows into the two flocculation tanks which has three mixers in series operating at declining speeds to allow for floc formation
- Flocculated water then enters the two clarifiers and sludge is removed by a travelling sludge rake. Sludge is sent to the duty sludge lagoon
- Clarified water enters the filter block, where it is dosed with chlorine and subsequently distributed across six gravity sand filters
- Filtered water enters a common channel. When flow in the filtered water channel is above 101 L/s, post-dosing of soda ash and chlorine are activated for pH adjustment and increased disinfection capacity, respectively. Water is also dosed with fluoride in the filtered water channel
- Flow from the filtered water channel enters the 3 ML clear water tank through a mid-level inlet and bottom outlet configuration
- Water from the clear water tank proceeds to clear water pumping station 1 (CWPS1), which has two 680 kW pumps and a smaller 317 kW pump that operate in a duty/standby/standby mode. CWPS1 distributes water to Jugiong drinking water supply system

Figure 13-3 Jugiong Water Treatment Plant - Clarification

***Source**: Atom Consulting, taken October 2016*

Figure 13-4 Jugiong Water Treatment Plant - Filters

***Source**: Atom Consulting, taken October 2016*

Figure 13-5 Jugiong Water Treatment Plant – Chlorine drums

***Source**: Atom Consulting, taken October 2016*

Figure 13-6 Jugiong Water Treatment Plant – Clear water tank

***Source**: Atom Consulting, taken October 2016*

13.7 Water Distribution

The Jugiong drinking water supply system is the second largest distribution systems managed by Goldenfields Water. Treated water in the system is distributed to the towns and villages listed in table 14.2.

Treated water is distributed through 14 reservoirs and by 8 pumping stations. One of the challenges for Goldenfields Water is maintaining free chlorine in a long distribution system. There are 138 km of trunk mains and 182 km of reticulation mains in the Jugiong system. Mains breaks are recorded and Goldenfields Water uses this data to schedule maintenance and future mains replacement works. There are two chlorine booster pumping stations located near Cootamundra and Harden to ensure adequate free chlorine residual is maintained throughout the system.

Table 13-2 Towns and Villages Supplied by Jugiong Drinking Water Supply System

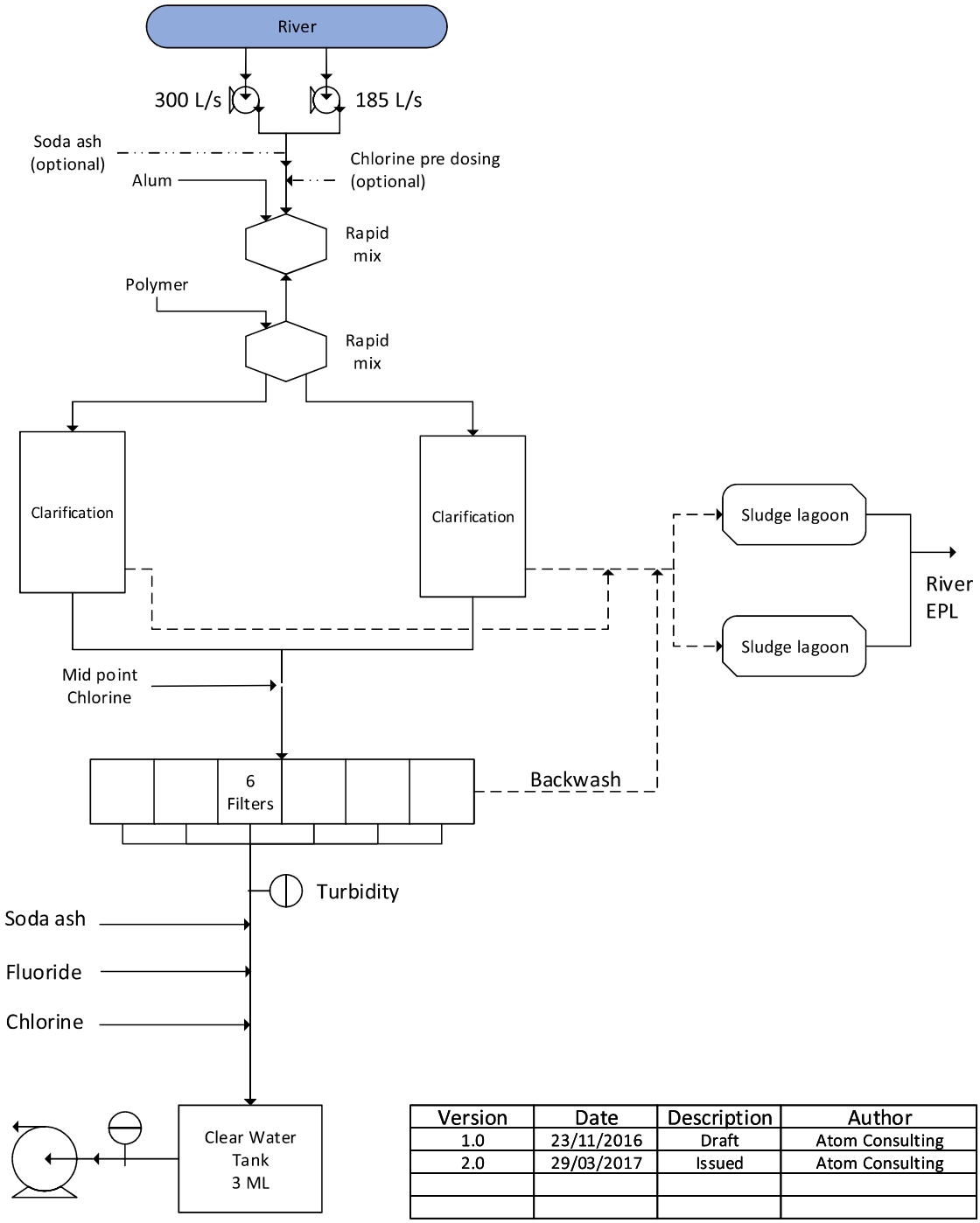
Town	Population Supplied
Cootamundra Shire Council	
Cootamundra	6,800
Stockinbingal	210
Wallendbeen	348
Harden Shire Council	
Jugiong	
Harden local government area	2,200
Temora Shire Council	
Springdale	
Young Shire Council	
Young local government area	8,000
Total population serviced	17,558

***Source**: HydroScience 2015*

13.8 Process Flow Diagrams

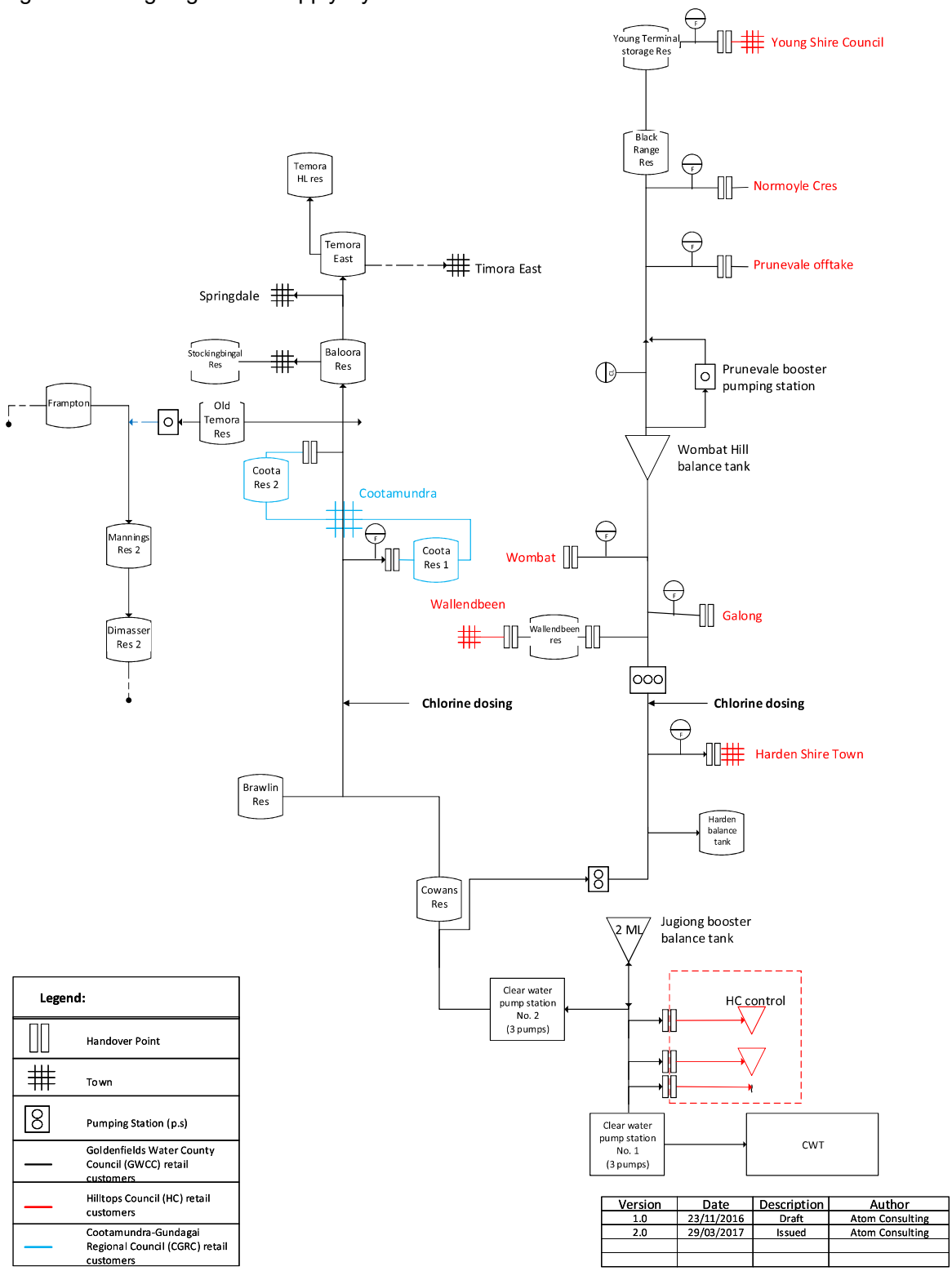
Figure 14.2 shows the process flow diagram of the Jugiong drinking water supply system from catchment to consumer.

Figure 13.2 Jugiong WTP process flow diagram



Version	Date	Description	Author
1.0	23/11/2016	Draft	Atom Consulting
2.0	29/03/2017	Issued	Atom Consulting

Figure 13.1 Jugiong Water Supply System



Version	Date	Description	Author
1.0	23/11/2016	Draft	Atom Consulting
2.0	29/03/2017	Issued	Atom Consulting

tem process flow diagram

13.9 References

HydroScience, 2015, *Goldenfields Water County Council Drinking Water Management System*, developed for Goldenfields Water County Council and NSW Health

NSW Office of Water (DPI Water), 2011, *Water Resources and Management Overview - Murrumbidgee Catchment*

14 APPENDIX E OURA WATER SUPPLY SYSTEM

14.1 Version Control

Document Status:	Issued			
Document History:	**Status**	**Author**	**Version**	**Date**
	Included within 2015 DWMS	HydoScience	Version 1.0	November 2015
	Issued	Atom Consulting	Version 2.0	March 2017
	Reviewed and Updated	Chris Breen		November 2022
Current version authors:	Natalie Crawford (Atom Consulting), Annalisa Contos (Atom Consulting)			
Contact:	Annalisa Contos Atom Consulting 65 Cambourne Avenue annalisa@atomconsulting.com.au			
File Name:	GWCC_Oura Water Supply System_v2.0.docx			

14.2 Amendment Summary

A summary of the changes made to the document is shown in **Table 14-1**.

Table 14-1. Critical and operational control point summary of changes

Version	Date	CCPs
Version 2.0	March 2017	Process flow diagram updated following October 2016 site visit
		Water supply system information split into individual water supply system from November 2015 DWMS

14.3 Description

The Oura drinking water supply system is one of the largest water supply systems managed by Goldenfields Water. The majority of water is delivered to retail customers; however, a small amount is supplied to Riverina Water in bulk to customers along the Goldenfields Water pipeline. Approximately 15,000 people are supplied water from the Oura system. The Oura drinking water supply system can be connected to Goldenfields Water's non-drinking water supply at Hylands Bridge.

14.4 Murrumbidgee Inland Alluvial Aquifer

Water in the Murrumbidgee Inland Alluvial Aquifer is recharged by the Murrumbidgee River and is managed by the mid Murrumbidgee alluvium groundwater management authority. There are two alluvial formations in this region: the Lachlan formation is a confined aquifer system that is overlain by the semi-confined to unconfined Cowra formation (NSW Dept. of Water and Energy, 2007). According to the DPI Water (NSW Office of Water, 2011), groundwater in the Oura system is fresh, with total dissolved solids (TDS) ranging from zero to 500 mg/L and is suitable for domestic stock, some irrigation purposes and municipal use.

14.5 Source water

Water is sourced from the Oura Borefield, which is located at Gumly Gumly Island to the north of Murrumbidgee River. Goldenfields Water is licensed to draw from four groundwater bores: Bore 2, Bore 3, Bore 4 and Bore 6. Bores are located in bore huts.

High catchment risks include pathogens entering the source water through surface water ingress, unrestricted livestock access and contamination due to seepage of pathogens from on-site sewerage management systems.

Figure 14-1 Oura bore 6

***Source**: GWCC Engineering photo taken December 2021*

14.6 Water Treatment Process

Water for the Oura drinking water supply system undergoes aeration, disinfection and fluoridation prior to distribution.

The treatment process for Oura drinking water supply system comprises of the following process steps:

- Groundwater is pumped from the Oura borefield by line shaft bore pumps in each bore. The bores are operated in sequential mode where increased water demand will increase the number of bores online. The order of bore start up is operator adjustable, with the current order of preference set as: Bore No. 4, 6 and 3
- The groundwater is dosed with chlorine prior to entering a tray aerator. The aerator serves to oxidate dissolved iron and manganese from the raw water
- After aeration, water is transferred to the Oura Contact Tank (2.2 ML), where chlorine contact time is achieved before being pumped by Oura pumping station to Marrar Pinnacle (Marrar Pinnacle 1.6 ML, 1 reservoir) or the Junee BT Reservoir (Junee 17 ML, 3 reservoirs)
- The Oura pumping station consists of two 605 kW pumps and a smaller 400 kW pump that operator on a duty/duty/standby configuration
- Fluoride is dosed on the outlet of the Oura pumping station

Figure 14-2 Oura aerators

***Source**; Atom Consulting, taken October 2015*

Figure 14-3 Oura chlorination

***Source**; Atom Consulting, taken October 2015*

14.7 Water Distribution

The Oura drinking water supply system is one of the largest distribution systems managed by Goldenfields Water. Treated water in the system is distributed to the towns and villages listed in table 12-2.

Treated water is distributed through 33 reservoirs and by 19 pumping stations. One of the challenges for Goldenfields Water is maintaining free chlorine in a long distribution system. There are 201 km of trunk mains and 1,055 km of reticulation mains in the Oura system. Mains breaks are recorded and Goldenfields Water uses this data to schedule maintenance and future mains replacement works. There are two chlorine booster pumping stations are located at Thanowring Road and Reefton pumping stations to ensure adequate free chlorine residual is maintained throughout the system.

Table 14-2 Towns and Villages Supplied by Jugiong Drinking Water Supply System

Town	Population Supplied	Bulk / Retail Water
Bland Shire Council		
Barmedman	214	Retail
Ungarie	378	Retail
West Wyalong	3,419	Retail
Wyalong	50	Retail
Coolamon Shire Council		
Ardlethan	438	Retail
Beckom		Retail

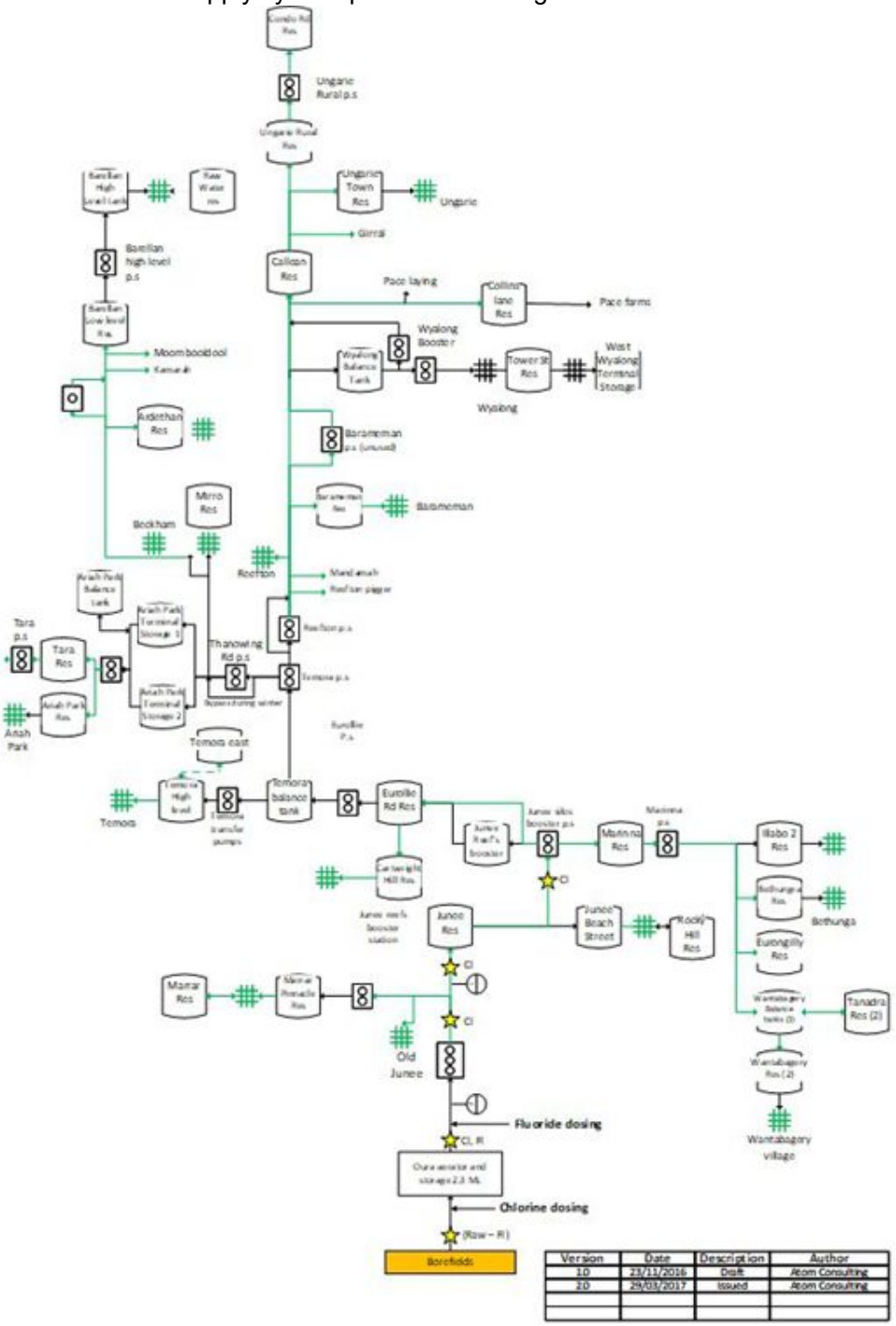
Town	Population Supplied	Bulk / Retail Water
Marrar	162	Retail
Junee Shire Council		
Bethungra	80	Retail
Eurongilly		Retail
Illabo	60	Retail
Junee	4,000	Retail
Wantabadgery		Retail
Narranderra Shire Council		
Barellan	**392**	**Retail**
Temora Shire Council		
Ariah Park	400	Retail
Temora	5,000	Retail
Wagga Wagga City Council		
Rural customers located on Goldenfields water main		Bulk
Total population serviced	**14,596**	

Source: HydroScience 2015

14.8 Process Flow Diagram

Figure 12 shows the process flow diagram of the Oura drinking water supply system from catchment to consumer.

Figure 12 Oura water supply system process flow diagram



14.9 References

HydroScience, 2015, *Goldenfields Water County Council Drinking Water Management System*, developed for Goldenfields Water County Council and NSW Health

NSW Office of Water (DPI Water), 2011, *Water Resources and Management Overview - Murrumbidgee Catchment*

15 APPENDIX F MOUNT ARTHUR WATER SUPPLY DESCRIPTION

15.1 Version Control

Document Status:	Issued			
Document History:	**Status**	**Author**	**Version**	**Date**
	Included within 2015 DWMS	HydoScience	Version 1.0	November 2015
	Issued	Atom Consulting	Version 2.0	March 2017
	Reviewed and Updated	Chris Breen		November 2022
Current version authors:	Natalie Crawford (Atom Consulting), Annalisa Contos (Atom Consulting)			
Contact:	Annalisa Contos Atom Consulting 65 Cambourne Avenue annalisa@atomconsulting.com.au			
File Name:	GWCC_Mt Arthur Water Supply System_v2.0.docx			

15.2 Amendment Summary

A summary of the changes made to the document is shown in **Table 15-1**.

Table 15-1. Critical and operational control point summary of changes

Version	Date	CCPs
Version 2.0	March 2017	Process flow diagram updated following October 2016 site visit
		Water supply system information split into individual water supply system from November 2015 DWMS

15.3 Description

The Mt Arthur drinking water system supplies approximately 2,300 people. The Mt Arthur system can be supplemented by the Oura drinking water supply system through Coolamon and Ganmain, however this is not common practice.

15.4 Lachlan Ford Belt Fracture Aquifer System

Water for the Mt Arthur drinking water supply system is drawn from the Lachlan Fold Belt fractured rock aquifer system, near the Murrumbidgee River at Matong. According to the DPI Water (NSW Office of Water, 2011), groundwater in this region is of moderate quality with TDS between 500 to 1,500 mg/L and is suitable for domestic stock and some irrigation purposes.

15.5 Source Water

Water is sourced from the Mt Arthur Borefield, which is located at near the Murrumbidgee River at Matong. Goldenfields Water is licensed to draw 762 ML per annum from two groundwater bores. Bores are located in bore huts.

High risks from the catchments with the potential to introduce pathogenic micro-organisms into the water supply include surface water ingress and contamination due to seepage of pathogens from on-site sewerage management systems.

Figure 15-1 Mt Arthur Bores 1

Source: GWCC photo taken December 2021

Figure 15-2 Mt Arthur Bore 2

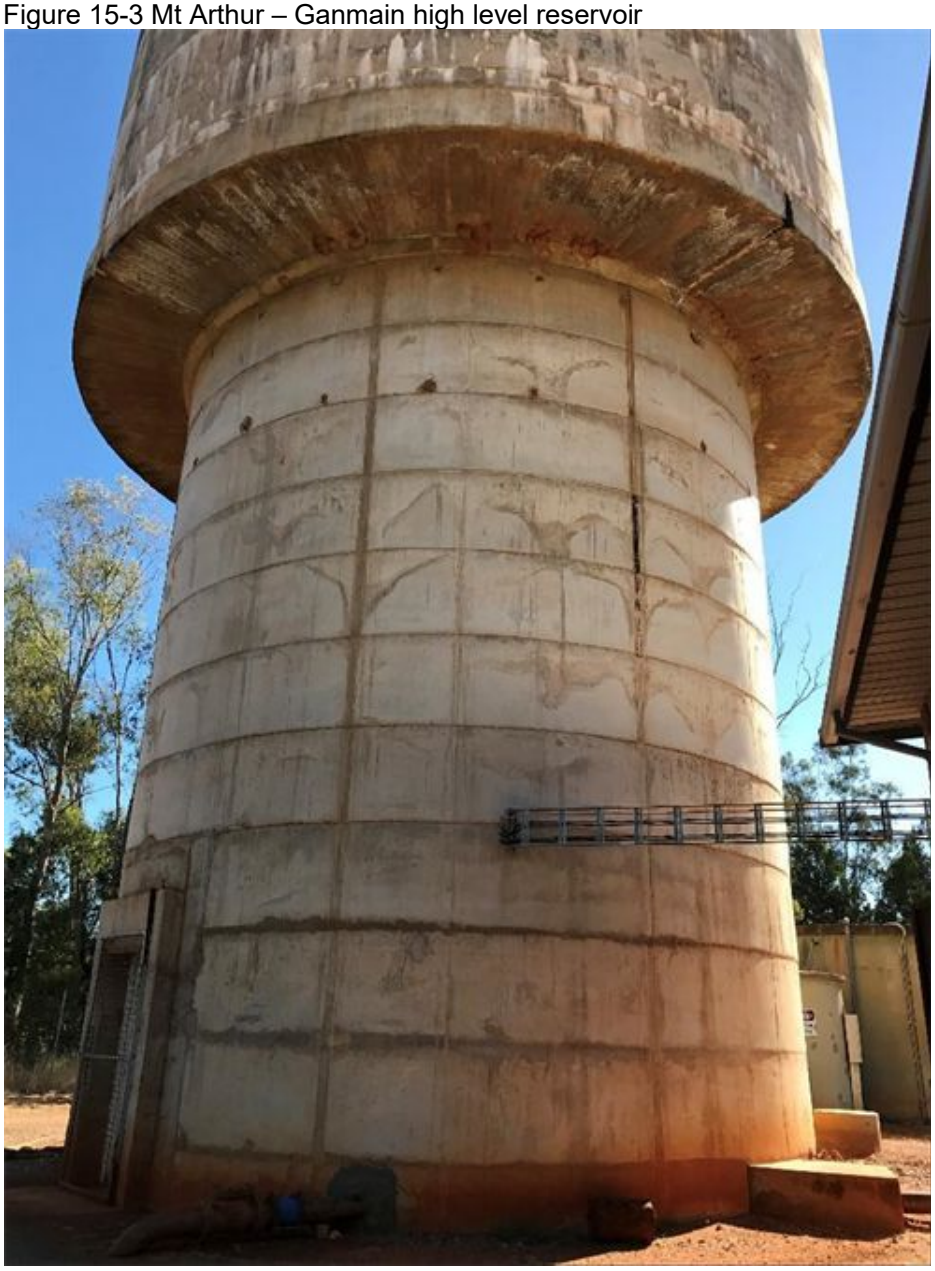
***Source**: GWCC WQ Technical Officer*

15.6 Water Treatment Process

The treatment process at the Mt Arthur drinking water supply system comprises of the following steps:

- Groundwater is pumped to the surface by two 94 kW bore pumps in a duty/stand-by configuration
- Water is injected with chlorine prior to entering the four Ganmain Low Level Reservoirs where iron and manganese are settled out
- The water is then distributed to retail consumers in Coolamon, Ganmain, Matong, and Grong Grong

Figure 15-3 Mt Arthur – Ganmain high level reservoir



Source: Atom Consulting, photo taken October 2016

Figure 15-4 Mt Arthur – Chlorination and Ganmain low level reservoir

Source: Atom Consulting, photo taken October 2016

Figure 15-5 Mt Arthur – Chlorine cylinder

***Source**: Atom Consulting, photo taken October 2016*

Figure 15-6 Mt Arthur – Ganmain pump station

***Source**: Atom Consulting, photo taken October 2016*

15.7 Water Distribution

The Mt Arthur drinking water supply system distributes water to the areas of Ganmain (population: 578), Coolamon (population: 1,261), Grong Grong (population: 250) and Matong (population: 250). Treated water is distributed through 9 reservoirs and by 6 pumping stations. One of the challenges for Goldenfields Water is maintaining free chlorine in a long distribution system. There are 76 km of trunk mains and 67 km of reticulation mains in the Mt Daylight system (HydroScience, 2015).

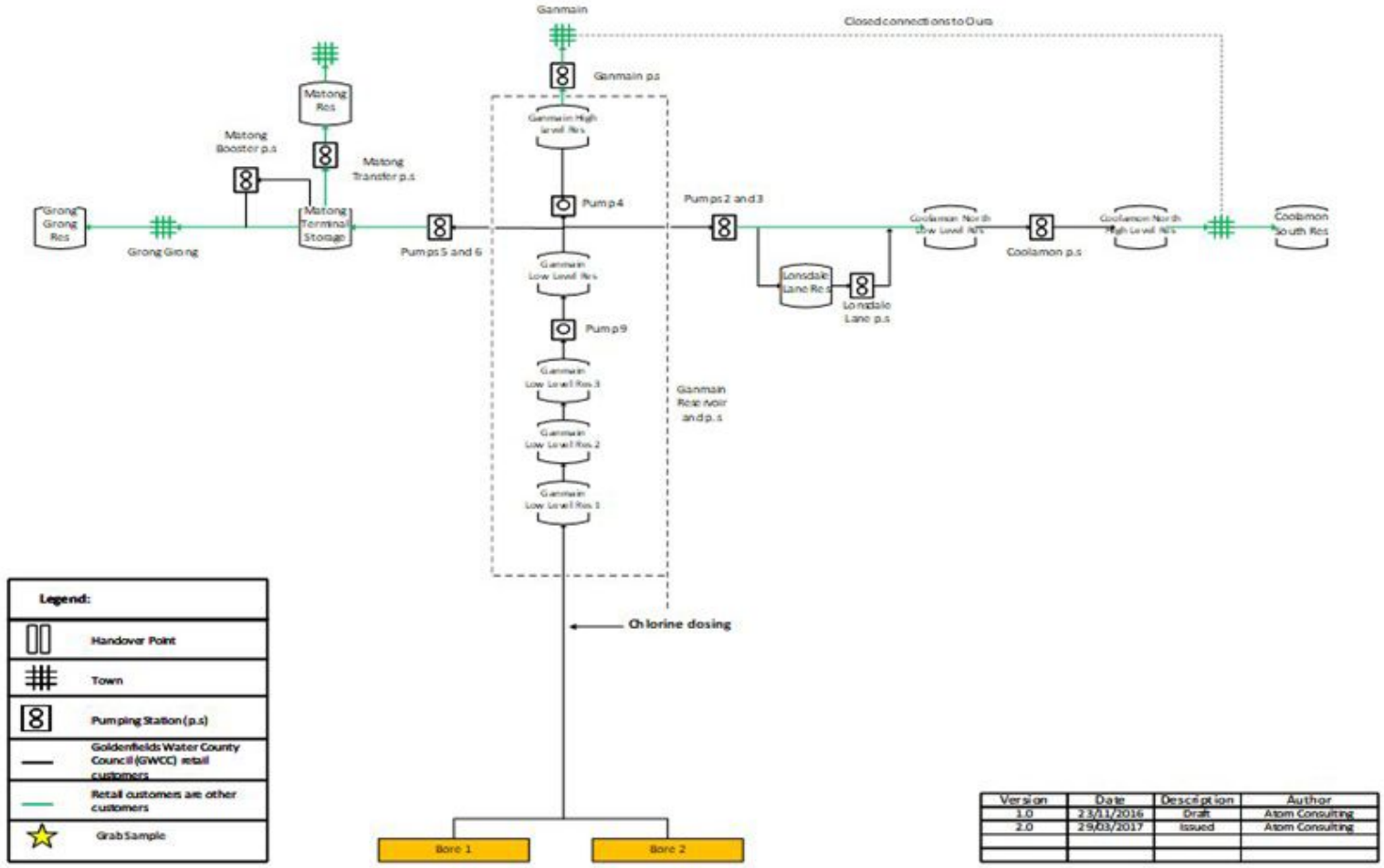
15.8 Process Flow Diagrams

Figure 13 shows the process flow diagram of the Mt Arthur drinking water supply system from catchment to consumer

Goldenfields Water

Drinking Water Management System

Figure 13 Mt Arthur



Version	Date	Description	Author
1.0	23/11/2016	Draft	Atom Consulting
2.0	29/03/2017	Issued	Atom Consulting

Version 3.0

15.9 References

HydroScience, 2015, *Goldenfields Water County Council Drinking Water Management System*, developed for Goldenfields Water County Council and NSW Health

NSW Office of Water (DPI Water), 2011, *Water Resources and Management Overview - Murrumbidgee Catchment*

16 APPENDIX G MOUNT DAYLIGHT WATER SUPPLY SYSTEM

16.1 Version Control

Document Status:	Issued			
Document History:	**Status**	**Author**	**Version**	**Date**
	Included within 2015 DWMS	HydoScience	Version 1.0	November 2015
	Issued	Atom Consulting	Version 2.0	March 2017
	Reviewed and Updated	Chris Breen		November 2022
Current version authors:	Natalie Crawford (Atom Consulting), Annalisa Contos (Atom Consulting)			
Contact:	Annalisa Contos Atom Consulting 65 Cambourne Avenue annalisa@atomconsulting.com.au			
File Name:	GWCC_Mt Daylight Water Supply System_v2.0.docx			

16.2 Amendment Summary

A summary of the changes made to the document is shown in **Table 16-1**.

Table 16-1. Critical and operational control point summary of changes

Version	Date	CCPs
Version 2.0	March 2017	Process flow diagram updated following October 2016 site visit
		Water supply system information split into individual water supply system from November 2015 DWMS

16.3 Description

The Mt Daylight drinking water is a water supply system supplies approximately 125 people in the villages and surrounds of Naradhan, Weethalle and Tallimba.

16.4 Lower Lachlan Alluvium Aquifer

The Mt Daylight drinking water supply system draws its groundwater from the lower Lachlan alluvium, located in the Lachlan River catchment (NSW Office of Water, 2011). The aquifers surrounding Lake Ballyrogan (Lake Brewster) from which the Mt Daylight bores draw water, is hydraulically connected to the surface water (National Resources Commission, 2006). This means that groundwater quality in the Mt Daylight system is linked to surface water quality, although it is expected that the groundwater will have lower turbidity due to filtration through subsurface flow. Both the DPI Water (NSW Office of Water, 2011) and National Resources Commission (2006) report that the groundwater in the Mt Daylight region is relatively fresh with low salinity, suitable for municipal use.

16.5 Source Water

Water is sourced from the Mt Daylight Borefield, which consists of two bores located in the Carathool Shire local government area, between Lake Brewster (Lake Ballyrogan) and the Lachlan River. The bores are jointly owned and operated between Goldenfields Water and Carrathool Shire Council for their respective drinking water supply systems. Goldenfields Water owns a 71% stake in the Mt Daylight bores and Carrathool Shire Council owns 29%. Carrathool Shire is responsible for the maintenance, repair and replacement of all bores (HydroScience, 2015).

High catchment risks include pathogens entering the source water through surface water ingress and contamination due to seepage of pathogens from on-site sewerage management systems.

16.6 Water Treatment Process

The treatment process at the Mt Daylight drinking water supply system comprises of the following steps:

- Groundwater is pumped to the surface by two 30 kW bore pumps in a duty/stand-by configuration to the Mt Daylight Reservoirs
- Water is injected with chlorine at the inlet to the Mt Daylight Reservoir
- Water is distributed to retail consumers in Naradhan, Weethalle and Tallimba

16.7 Water Distribution

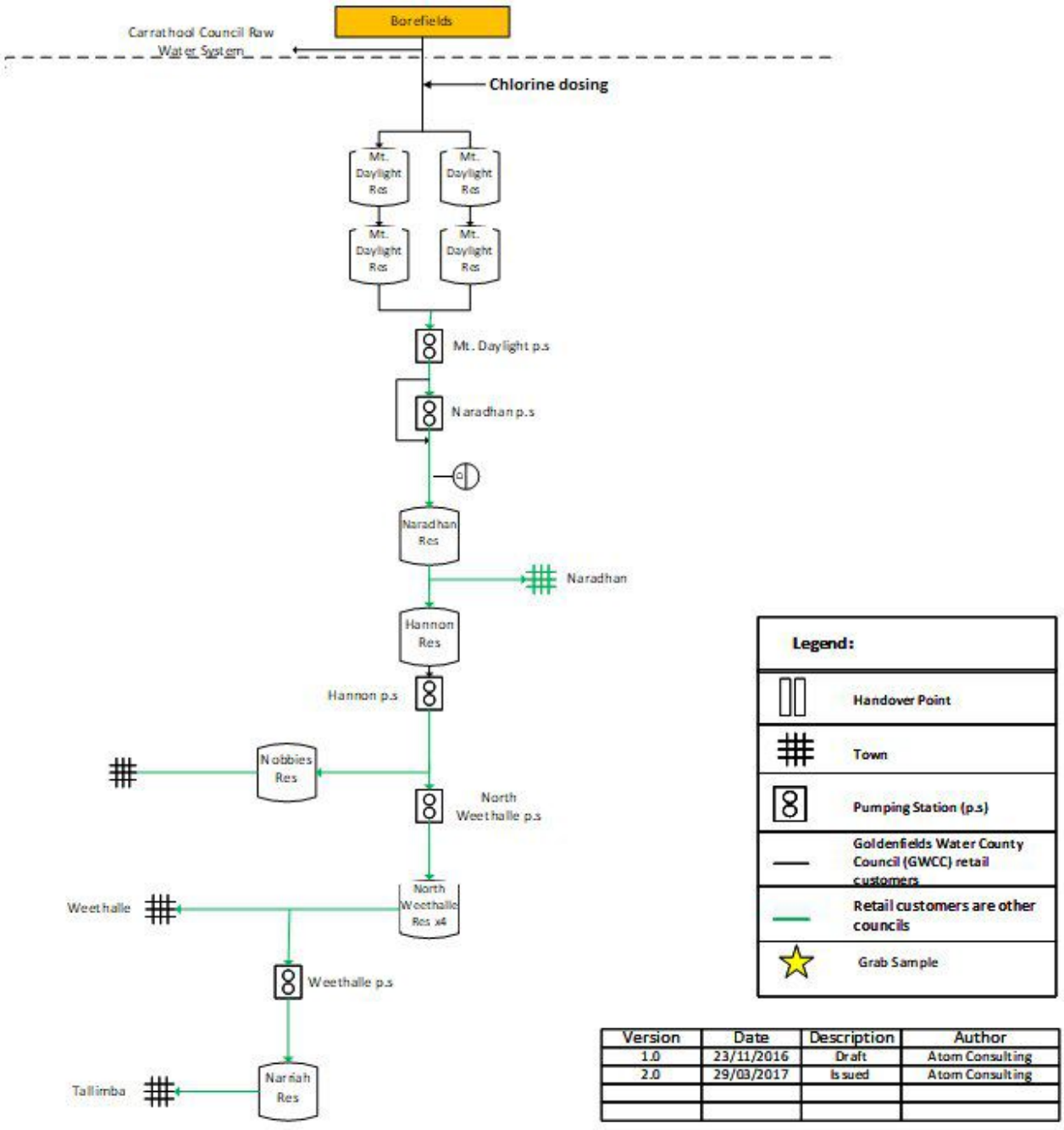
The Mt Daylight drinking water supply system distributes water to approximately 125 people in the villages and surrounds of Naradhan, Weethalle and Tallimba. Treated water is distributed through 7 reservoirs and by 5 pumping stations. One of the challenges for Goldenfields Water is maintaining free chlorine in a long distribution system. There are 308 km of trunk mains and 8 km of reticulation mains in the Mt Daylight system. Mains breaks are recorded and Goldenfields Water

uses this data to schedule maintenance and future mains replacement works (HydroScience, 2015).

16.8 Process Flow Diagram

Figure 17.1 shows the process flow diagram of the Mt Daylight drinking water supply system from catchment to consumer.

Figure 16.1 Mt Daylight water supply system process flow diagram



Version	Date	Description	Author
1.0	23/11/2016	Draft	Atom Consulting
2.0	29/03/2017	Issued	Atom Consulting

16.9 References

HydroScience, 2015, *Goldenfields Water County Council Drinking Water Management System*, developed for Goldenfields Water County Council and NSW Health

National Resources Commission, 2006, *Scientific Review Lower Lachlan Groundwater Sharing Plan - November 2006*

NSW Office of Water (DPI Water), 2011, *Water Resources and Management Overview - Lachlan Catchment*

Goldenfields Water

Policy No. PP028

Drinking Water Quality

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Goldenfields Water

1 INFORMATION ABOUT THIS POLICY

POLICY INFORMATION

Date Adopted by Board: 23 August 2018	**Board Resolution No.** 18/065
Policy Responsibility: Production and Services Manager	
Review Timeframe Annually	
Last Review 2018	**Next Scheduled Review** 2019

DOCUMENT HISTORY

DOCUMENT NO.	DATE AMENDED	SUMMARY OF CHANGES
1	13/08/2018	New Policy Document
2	25/11/2022	Review only, no changes

FURTHER DOCUMENT INFORMATION AND RELATIONSHIPS

Related Legislation	**Public Health Act 2010** **Public Health Regulation 2012** **Fluoridation of Public Water Supplies Act 1957** **Fluoridation of Public Water Supplies regulation 2017**
Related Policies	**PP006 Backflow Prevention Policy** **PP007 Water Services Connection** **PP013 WHS Policy** **PP020 Complaints Management Policy**
Related Procedures, Protocols, Statements and Documents	**Adherence with Australian Drinking Water guidelines**

Goldenfields Water

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Goldenfields Water

3 PURPOSE

This policy supports Goldenfields Water County Council's commitment to the effective management of drinking water and the associated distribution system. This includes the provision of responsible, safe and sustainable drinking water that meets the needs of our customers, shareholders and communities, and consistently meets the Australian Drinking Water Guidelines.

4 SCOPE

This policy applies to all activities undertaken by Goldenfields Water County Council to support the current and future supply of drinking water. It also supplies guidance to Goldenfields Water employees and contractors

5 DEFINITIONS

ADWG - *Australian Drinking Water Guidelines*

NHMRC - *National Health and Medical Research Council*

NRMMC - *Natural Research Management Ministerial Council*

6 POLICY

Goldenfields Water is committed to managing its water supply effectively to provide a safe, high-quality drinking water that consistently meets the NHMRC/NRMMC *Australian Drinking Water Guidelines*, and consumer and other regulatory requirements.

To achieve this, in partnership with stakeholders and relevant agencies, Goldenfields Water will:

- manage water quality at all points along the delivery chain from source water to the consumer;
- use a risk-based approach in which potential threats to water quality are identified and balanced;
- integrate the needs and expectations of our consumers, stakeholders, regulators and employees into our planning;
- establish regular monitoring of the quality of drinking water and effective reporting mechanisms to provide relevant and timely information, and promote confidence in the water supply and its management;
- develop appropriate contingency planning and incident response capability;
- participate in appropriate research and development activities to ensure continued understanding of drinking water quality issues and performance;
- contribute to the debate on setting industry regulations and guidelines, and other standards relevant to public health and the water cycle;
- continually improve our practices by assessing performance against corporate commitments and stakeholder expectations.
- ensure that all employees involved in the supply of drinking water receive appropriately training and education to maintain their competency in understanding, implementing, maintaining and continuously improving the drinking water quality management system.

Goldenfields Water will implement and maintain a drinking water quality management system consistent with the *Australian Drinking Water Guidelines* to manage effectively the risks to drinking water quality.

GOLDENFIELDS WATER COUNTY COUNCIL – DECEMBER 2022

REVIEW OF ORGANISATIONAL STRUCTURE

Report prepared by General Manager

COUNCIL OFFICER RECOMMENDATION

That the Board acknowledge the review of the organisational structure and that no changes are required at this time.

ALIGNMENT WITH BUSINESS ACTIVITY STRATEGIC PLAN

Priority 2 Customer Service Focus

BACKGROUND

County Councils must review their organisational structure within 12 months of Local Government elections (Section 333 Local Government Act 1993).

When reviewing the structure, Council may redetermine the organisational structure, however, are not required to do so.

The General Manager must, after consulting the Board, determine the positions withing the structure of the council. The positions must be determined to give effect to the priorities set out in the Business Activity Strategic Plan and council's Delivery Program Section 332 Local Government Act 1993).

REPORT

The General Manager has reviewed the current organisational structure, and deemed no changes are required at this time.

Goldenfields Workforce Management Plan 2022-2026 was developed in conjunction with, and in due consideration of, the Business Activity Strategic Plan and the Delivery Program. It is the General Managers advice that the current structure enables the delivery of the Business Activity Strategic Plan and the Delivery Program at this time.

FINANCIAL IMPACT STATEMENT

The recommendation does not impact on Council's financial position.

ATTACHMENTS: Nil

TABLED ITEMS: Nil

GOLDENFIELDS WATER COUNTY COUNCIL – DECEMBER 2022

DELEGATIONS OF AUTHORITY

Report prepared by Human Resources Coordinator

COUNCIL OFFICER RECOMMENDATION

That Council adopt PP005 Delegations of Authority Policy.

ALIGNMENT WITH BUSINESS ACTIVITY STRATEGIC PLAN

Priority 1 High Quality, Secure and Efficient Water Supplies

BACKGROUND

In accordance with section 380 of the Local Government Act 1993, Council must review its delegations during the 12 months of each term of office.

REPORT

PP005 Delegations of Authority Policy has been reviewed in accordance with Section 380 of the Local Government Act 1993. Section 5.2.2 (k) has been amended to reflect the increase to the maximum authorised amount for write off of uncollectible debts as per PP025 Bad Debt Policy and Council resolution 22/079.

FINANCIAL IMPACT STATEMENT

The recommendation does not impact on Council's financial position.

ATTACHMENTS: PP005 Delegation of Authority Policy

TABLED ITEMS: Nil.

Goldenfields Water

Policy No. PP005

Delegations of Authority Policy

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Goldenfields Water

Policy No. PP005

Delegations of Authority Policy

1 INFORMATION ABOUT THIS POLICY

POLICY INFORMATION

Date Adopted by Board 27 October 2016	**Resolution No.** 16/098
Policy Responsibility General Manager	
Review Timeframe 4 yearly	
Last Review December 2022	**Next Scheduled Review** December 2026

DOCUMENT HISTORY

DOCUMENT NO.	DATE AMENDED	SUMMARY OF CHANGES
	24/10/2019	Inclusion of specific delegations for the Chairperson and General Manager.
	08/12/2022	**Review of Policy in line with Section 380 of the Local Government Act 1993.** **Amendment to Section 5.2.2 k.**
	DD/MM/YYYY	
	DD/MM/YYYY	
	DD/MM/YYYY	
	DD/MM/YYYY	
	DD/MM/YYYY	

FURTHER DOCUMENT INFORMATION AND RELATIONSHIPS

Related Legislation	**Local Government Act 1993**
Related Policies	**PP025 Bad Debt Policy**
Related Procedures, Protocols, Statements and Documents	**P003 Procurement of Goods, Services & Materials Procedure**

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3 DELEGATIONS

In accordance with Section 377 Local Government Act 1993 the Goldenfields Water County Council at a Meeting held on 8 December 2022 ratified and granted the delegations as set out in this Delegations of Authority Policy to the Chairperson, Deputy Chairperson and General Manager.

3.1 Terms of Delegation

Delegations will remain in force until otherwise revised or revoked by resolution of Council in accordance with the Local Government Act 1993 ("the Act") (as amended).

Delegations will be reviewed within twelve months of a new Council term.

3.2 General

Council recognises that it cannot delegate those powers, authorities, duties and functions contained in Section 377 (1) of the Act (as amended), and that are required by legislation to be exercised by a resolution of Council.

Any function that is delegated by the Council may, notwithstanding the delegation, still be exercised by the Council.

Council may, by resolution, supervise, control and direct the Chairperson, General Manager, and Deputy Chairperson in the exercise of any delegated function.

The Chairperson, General Manager, Deputy Chairperson will exercise the powers, authorities, duties and functions delegated, in accordance with and subject to the provisions of any relevant legislation and in accordance with relevant policies of Council.

4 CHAIRPERSON

4.1 General

That the Chairperson (being Dennis Palmer), or Deputy Chairperson (being David McCann) when acting for the Chairperson, be delegated authority under section 377 of the Act to exercise and/perform on behalf of the Council the powers, authorities, duties and functions as prescribed for the position of Chairperson under the Act, Schedules, Regulations, cognate Legislation, related Legislation, Councils own adopted Policies, Codes and Resolutions, provided that such delegations are not to be sub-delegated without specific approval by Council or as prescribed under the Act.

If, under any other Act, a function is conferred or imposed on the Chairperson of a County Council, the function is taken to be conferred or imposed on the Council and the Chairperson of the County Council will exercise and/or perform on behalf of the Council the powers, authorities, duties and functions as prescribed under that other Act.

4.2 Specific Delegations - Chairperson

4.2.1 Conferring Powers or Duties

To give effect to the provisions of the Act, including but not limited to Sections 225-231 of the Act and any other Act conferring powers or duties upon the Chairperson and to any resolution of direction given to the Chairperson by Council.

4.2.2 Preside at Meetings of Council

To preside at all meetings of the Council , Committees , Community Committees and Public Meetings convened by the Council at which the Chairperson is present unless the Chairperson otherwise appoints another Councillor or person to perform this function.

4.2.3 Negotiations on behalf of Council

The Chairperson in conjunction with the General Manager, to participate in negotiations on behalf of the Council with third parties in relation with any significant matter associated with the operations of Goldenfields Water County Council.

4.2.4 Code of Conduct

To give direction to the Council, following consultation with the General Manager, in the application of the Code of Conduct as adopted by Council.

4.2.5 Represent Council-Government and Other Forums

To represent the Council, in conjunction with the General Manager in deputations to government enquiries and other forums where it is appropriate that the Chairperson should present the Councils position.

4.2.6 Sign and Execute Documents

To sign and execute documents under the Seal of Council in conjunction with the General Manager.

4.2.7 Media Releases

To make Media Statements and issue Press Releases in respect of Councils Resolutions/Recommendations and decisions.

4.2.8 Approval of Urgent Works

To authorise expenditure outside the Council approved budget and in consultation with the General Manager, to undertake urgent works in order to reduce or eliminate a significant safety hazard or critical matter affecting the operation of the water supply system up to an amount of $100,000 subject to the action being reported to the next meeting of Council.

5 GENERAL MANAGER

5.1 General

That the General Manager of Goldenfields Water County Council (being Aaron Drenovski) be delegated authority under section 377 of the Act to exercise and /or perform on behalf of Council the powers, authorities, duties and functions of Council as prescribed under the Act, Schedules Regulations, Cognate Legislation, and related legislation and including those powers, authorities, duties and functions as listed in this delegation excepting those powers, authorities, duties and functions of the Council that are expressly prohibited from delegation as listed under Section 377 of the Act.

If, under any other Act a function is conferred or imposed on the General Manager of Council, the function is taken to be conferred or imposed on the Council and the General manager of the Council will exercise and/or perform on behalf of the Council, powers, authorities duties and functions as prescribed under the other Act pursuant to Section 381 of the Act.

For the purposes of Section 381 of the Act , the General Manager's delegated authority to act on behalf of Council includes all functions and powers conferred or imposed by any legislation set out from time to time in Section 22 of the Act, including but not limited to the following:

Legislation	Function/power
Conveyancing Act 1919	Placing covenants on council land
Fluoridation of Public Water Supplies Act 1957	Fluoridation of water supply by Council
Public Health Act 1991	Inspection of systems for purposes of microbial control
Roads Act 1993	Roads

The exercise by a council of its functions under this Act may also be modified by the provisions of another Act. Some of those Acts and some of the modifications they affect include:

Legislation	Modification
Government Information (Public Access) Act 2009	Council required to publish certain information and to grant access to certain documents
Privacy and Personal Information Protection Act 1998	Council required to amend certain records that are shown to be incomplete, incorrect, out of date, or misleading
Unclaimed Money Act 1995	Unclaimed money to be paid to the Chief Commissioner of Unclaimed Money

That in the absence of the General Manager that his nominee as Acting General Manager assume all power and delegations of the General Manager for the period only of his absence.

In addition to the delegated authority conferred or imposed upon the General Manager by legislation, the General Manager is empowered to carry out his functions in reliance upon Section 335 of the Act and in accordance with the following delegated authorities, subject to any express limitations contained within this Register or restrictions imposed by Section 377 of the Act.

5.2 Specific Delegations – General Manager

5.2.1 Part A - Operational

a) To establish, review and authorise operational and management policies and procedures in line with strategic directions set by Council.
b) To implement any work, service or action provided for in the adopted budget without further reference to Council except for;
   - The acceptance of tenders which are required under the Local Government Act 1993 to be invited by the Council, and
   - The determination of priorities where lump sum funding only has been provided.
c) To authorise destruction or disposal of any records of Goldenfields Water County Council, after the expiration of six (6) years from the last transaction thereon, other than those defined in the Regulation and Local Government Records Disposal schedule.
d) To negotiate arrangements for agencies and financial institution to collect payments relating to the operation of Goldenfields Water County Council.
e) To write proposals or submissions to other levels of government on behalf of Goldenfields Water County Council.
f) To deal with and determine applications for access to information under the Government Information (Public Access) Act and Regulation 2009.

g) To execute any form of instrument necessary for the creation of easements that will benefit Goldenfields Water County Council for access services , pipelines , structures and/or any other form of assistance essential in the performance of its objectives.
h) To sign all correspondence relating to Goldenfields Water County Council.
i) To approve the loan of Goldenfields Water County Council equipment to community groups in accordance with Council's Policy.
j) To impose water restrictions on fixed hoses and sprinklers and lift such restrictions when appropriate.
k) To restrict or cut off supply of water to a property due to non-payment of water charges as provided under Clause 144 of the Local Government (General) Regulation 2005.
l) To sign certificates issued in accordance with the provisions of Sections 603 (Certificate as to Rates and Charges) & 735A (Certificate as to Notices) of the Local Government Act 1993.

5.2.2 Part B - Finance

a) Obtain quotations and to authorise the purchase of, and issue official orders for goods, works and services requiring the functioning of Council and to incur expenditure for such goods, works and services up to $250,000 provided that provision has been made in the approved Budget for incurring of such expenditure. The delegation is limited in accordance with Section 377(1)(i) of the Act with the exception of prescribed agency contracts under 163 of the Local Government (General) Regulations 2005 and Section 55 of the Act.
b) To certify that the prices and computations on vouchers have been checked and are correct in as far as he has been able to ascertain , are fair and reasonable and are in accordance with any quotation /contract under which the goods /services were supplied.
c) Authorise the payment of Councils Salaries and Wages.
d) Approve final payment to contractors and/or direct creditors.
e) To sign or countersign cheques drawn on Council's Bank accounts.
f) Approve changes in Plant Hire Rate Charges for all council plant.
g) To authorise expenditure outside the approved Council budget to enable urgent works to be undertaken to reduce or eliminate a significant safety hazard or critical matter affecting the operation of the water supply system up to an amount of $50,000 subject to the action being reported to the next meeting of Council.
h) The authority to require the lodgement of a cash bond or bank guarantee for work outstanding.
i) To negotiate Council overdraft limit.
j) To sell old materials, spoilt or obsolete equipment.
k) To authorise the writing off of uncollectible debts up to a maximum amount for a single debtor of $3,000.
l) To arrange the investment of money that is not, for the time being, required by Council for any other purpose. Funds may only be invested in the following;
    - In any security authorised by the Trustee Act.
    - In the form of investment notified by order of the Minister published in the Gazette.
    - Investments shall also be managed in accordance with Councils Policy (PP04).

5.2.3 Part C - Legal

a) To approve and settle statements of claim and insurance matters up to the level of Goldenfields Water's excess amounts payable under the respective insurance policies.
b) To determine a response to approvals sought under Part 1, Division 3-making and determination of applications for approval-generally, under the Local Government Act 1993.
c) To issue Orders under Chapter 7, Part 2 (Orders) of the Local Government Act 1993.

d) To affix the Common Seal of the Council and execute any documents requiring the signature of the General Manager in the company of the Chairperson, Deputy Chairperson, or other Councillor where Council has approved the documents intent.
e) To authorise the institution of legal proceedings for the recovery of outstanding charges and other debts due to Goldenfields Water County Council and to take all necessary action to recover such charges and debts.
f) Under Section 687 (Appearance in Local Court) of the Local Government Act 1993, as amended, be authorised to represent Goldenfields Water County Council in all proceedings in any Local Court or before any justice in all respects as though he were the party concerned and to institute and carry on proceedings which Goldenfields Water is authorised to institute and carry out under the said Act and shall extend to any proceedings under all other Acts.
g) To accept service of legal documents on behalf of Goldenfields Water County Council.
h) Contracts;
   - To terminate a contract where the conditions of the contract have been breached and provide for such action.
   - To approve extensions of time to contractor schedules except contracts subject to a tendering arrangement.
   - To issue Site instructions to the contractor and/or their staff.
   - To call for an audit of a contract using either internal or external audit staff.
   - To issue a Practical Completion Certificate for works or part thereof under a contract.
   - To sign contracts that have been approved by Council.
i) To approve Power of Entry under the provisions of Sections 191-201 of the Local Government Act 1993 for the purpose of inspections, works, and other functions permitted under these sections. The power of entry is also granted for the purposes of inspecting premises under the Public Health Act 1991.
j) To approve closure of roads or parts thereof, temporarily for repairs or construction and to approve applications to install pipelines within road reserves.
k) To authorise action in regard to any complaints or requests received under Councils Internal Reporting Policy.

5.2.4 Part D - Environmental / Planning Matters

a) To authorise all functions pursuant to Goldenfields Water County Council powers under the Environmental Planning & Assessment Act 1979 as amended in relation to development proposals including subdivisions.
b) In relation to subdivision proposals;
   - To approve designs, plans and specifications for water supply works in subdivisions, subject to those designs, specifications and plans being in accordance with Council subdivision policies.
   - To certify that bonded works have been completed to Goldenfields Water County Council's satisfaction and then release the relevant bond.
   - To authorise the release of Certificates of Compliance for a subdivision when all conditions of relevant approvals relating to water supply have been met.
   - To authorise signing of linen plans of subdivisions when all water supply conditions have been met.

5.2.5 Part E - Staff

a) To authorise the appointment of new staff within the adopted organisation's staff structure.
b) To negotiate with staff and Unions in relation to all staffing matters.
c) Reclassify staff and adjust salaries in accordance with Goldenfields Water County Council Enterprise Award.

d) To determine all leave applications for all staff having regard to the proper functioning of the Council and maintenance of appropriate levels of service to customers.

6 SUB DELEGATIONS

In accordance with Section 378 (2) of the Local Government Act, the General Manager may sub delegate any of the functions delegated to the General Manager by Council to any person or body (including another employee of the Council).

GOLDENFIELDS WATER COUNTY COUNCIL – DECEMBER 2022

PAYMENT OF EXPENSES AND PROVISION OF FACILITIES TO COUNCILLORS POLICY

Report prepared by General Manager

COUNCIL OFFICER RECOMMENDATION

That Council:

1. Endorses the draft Payment of Expenses and Provision of Facilities to Councillors Policy (PP003) to be placed on public display for a period of 28 days
2. Adopt the policy as presented if no submissions are made within the public display period

ALIGNMENT WITH BUSINESS ACTIVITY STRATEGIC PLAN

Priority 2 Customer Service Focus

BACKGROUND

In the 12 months following Local Government elections, Council must adopt a new policy on the payment of expenses and provision of facilities to councillors policies (Local Government Act 1993).

REPORT

Councils Payment of Expenses and Provision of Facilities to Councillors Policy has been reviewed and altered as required to ensure consistency with the Local Government Act 1993, Local Government Regulation 2021 and the Office of Local Government Guidelines.

Section 253(1) of the Act requires council to give public notice of its intention to adopt or amend a policy for the payment of expenses and provision of facilities allowing at least 28 days for the making of public submissions.

The Draft Payment of Expenses and Provision of Facilities to Councillors Policy will be placed on Public Display for a period of 28 days. Should any submissions be made during the display period, they will be brought to the February Council meeting for consideration as per 253(2) of the Act. However, if no submissions are made during the display period the policy may be adopted as presented.

FINANCIAL IMPACT STATEMENT

The recommendation does not impact on Council's financial position.

ATTACHMENTS: Draft PP003 Payment of Expenses and Provision of Facilities to Councillors Policy

TABLED ITEMS: Nil

Goldenfields Water

Policy No. PP003

Payment of Expenses and Provision of Facilities to Councillors Policy

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Goldenfields Water

Policy No. PP003

Payment of Expenses and Provision of Facilities to Councillors Policy

1 INFORMATION ABOUT THIS POLICY

POLICY INFORMATION

Date Adopted by Board: 17 November 2017	**Board Resolution No. 17/076**
Policy Responsibility: General Manager	
Review Timeframe: 4 Yearly	
Last Review: 2017	**Next Scheduled Review** DD/MM/YYYY

DOCUMENT HISTORY

DOCUMENT NO.	DATE AMENDED	SUMMARY OF CHANGES
	12/06/2016	**Policy updated to be consistent with the Local Government Act 1993 (the Act) and Local Government (General) Regulation 2005 (the Regulation) and the Office of Local Government's (OLG) Guidelines for the payment of expenses and provision of facilities for Mayors and Councillors in NSW (the Guidelines).**
	24/08/2017	**Policy updated to be consistent with the Local Government Act 1993 (the Act) and Local Government (General) Regulation 2005 (the Regulation) and the Office of Local Government's (OLG) Guidelines for the payment of expenses and provision of facilities for Mayors and Councillors in NSW (the Guidelines).**
	DD/MM/YYYY	**Policy updated to be consistent with the Local Government Act 1993 (the Act) and Local Government (General) Regulation 2021 (the Regulation) and the Office of Local Government's (OLG) Guidelines for the payment of expenses and provision of facilities for Mayors and Councillors in NSW (the Guidelines).**
	DD/MM/YYYY	
	DD/MM/YYYY	
	DD/MM/YYYY	
	DD/MM/YYYY	

FURTHER DOCUMENT INFORMATION AND RELATIONSHIPS

Related Legislation	**NSW Local Government Act 1993** **Local Government (General) Regulations 2021**

Goldenfields Water

Policy No. PP003

Payment of Expenses and Provision of Facilities to Councillors Policy

Related Policies	**Code of Conduct**
Related Procedures, Protocols, Statements and Documents	**Division of Local Government Guidelines, Department of Premier and Cabinet for payment of expenses and provision of facilities.** **Division of Local Government Circulars to** **Councils. ICAC publications.** **Local Government Remuneration Tribunal Determination** **Local Government (State) Award** **NSW Crown Employees (Public Service Conditions of Employment) Reviewed Award 2009**

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Contents

3 PURPOSE

This policy enables the reasonable and appropriate reimbursement of expenses and provision of facilities to Councillors to help them undertake their civic duties.

It ensures accountability and transparency, and seeks to align Councillor expenses and facilities with community expectations. Councillors must not obtain private or political benefit from any expense or facility provided under this policy.

The policy has been prepared in accordance with the *Local Government Act 1993* (the Act) and *Local Government (General) Regulation 2021* (the Regulation), and complies with the Office of Local Government's Guidelines for the payment of expenses and provision of facilities to Mayors and Councillors in NSW.

The policy sets out the specific expenses that council may incur and facilities that may be provided. Expenses not explicitly addressed in this policy will not be paid or reimbursed.

4 SCOPE

This policy applies to all payments of Councillor's annual fees, chairperson's fee, expenses and provisions of facilities to Chairperson, Deputy Chairperson and Councillors.

5 DEFINITIONS

Accompanying person - Is the Councillor's or Chairperson's, or Deputy Chairperson's Spouse, partner or nominate person.

ALGA – Australian Local Government Association

Appropriate Refreshments - Means food and beverages, excluding alcohol, provided by Council to support Councillors undertaking official business

Act - Local Government Act (1993)

Additional Expenses - Any Shared Executive Assistant / Secretarial Services including Typing, photocopying, printing, postage, facsimile, computer, data and telephone facilities

Annual Fee - The Annual Fee paid to Councillors between the Minimum and Maximum for GWCC determined annually by the Tribunal, and any specific resolution of GWCC under Section 245 of the Act.

Award - Local Government (State) Award

Chairperson - Elected Chairperson of GWCC

Chairperson's Fee - The additional Annual Fee paid to the Chairperson between the Minimum and Maximum for GWCC determined the Tribunal, and any specific resolution of GWCC under Section 249 of the Act.

Clause - Unless stated otherwise, a reference to a clause is a reference to a clause of this policy

Code of Conduct - Means the Code of Conduct adopted by Council or the Model Code if none is adopted

Councillor - Councillor of GWCC

Deputy Chairperson - Elected Deputy Chairperson of GWCC

Determination - The annual determination of the Tribunal per c241 Act

General Manager - Means the General Manager or Council and includes their delegate or authorised representative.

GWCC - Goldenfields Water County Council

GWCC Documents - Anything delivered electronically for purpose of conducting GWCC business.

GWCC Personal Device - Electronic device provided by GWCC for delivery of GWCC documents.

ICAC - The Independent Commission Against Corruption

Incidental Personal Use - Means use that is infrequent and brief and use that does not breach this policy or Code of Conduct

LGNSW - Local Government NSW

LGWA - Local Government Women's Association

Local Travel Costs - Car Hire, Any Fares -including but not limited to bus, train, tram, ferry, and or taxi fares, motorway or bridge tolls and parking costs

Maximum - The Determination's Maximum Annual Fee per s239 Act

Minimum - The Determination's Minimum Annual Fee per s239 Act

Official Business – Means functions that the Councillors are required or invited to attend to fulfil their legislated role and responsibilities for Council or result in a direct benefit for council and/or for the local government area, and includes:

- Meetings of council and committees of the whole
  Meetings of committees facilitated by council Civic receptions hosted or sponsored by council
- Meetings, functions, workshops and other events to which attendance by a councillor has been requested or approved by council

Professional Development - Means a seminar, conference, training course or other development opportunity relevant to the role of a councillor

Regulations - Local Government (General) Regulations 2021 (NSW)

Substitute - A Councillor substituted to attend any conference in lieu of the chairperson or a nominated and authorise Councillor

Tribunal - The Local Government Remuneration Tribunal

Year - Means the financial year, that is the 12 month period commencing on 1 July each year

6 INTRODUCTION

6.1 The provision of expenses and facilities enables Councillors to fulfil their civic duties as the elected representatives of GWCC.

6.2 The community is entitled to know the extent of expenses paid to Councillors, as well as the facilities provided

6.3 The purpose of this policy is to clearly state the facilities and support that are available to Councillors to assist them in fulfilling their civic duties

6.4 Council staff are empowered to question or refuse a request for payment from a Councillor when it does not accord with this policy

6.5 Expenses and facilities provided by this policy are in addition to fees paid to Councillors. The minimum and maximum fees a Council may pay each Councillor are set by the Local Government Remuneration Tribunal as per Section 241 of the Act and reviewed annually. Council must adopt its annual fees within this set range.

7 OBJECTIVES AND COVERAGE OF THE POLICY

7.1 Enable the reasonable and appropriate reimbursement of expenses incurred by Councillors while undertaking their civic duties

7.2 Enable facilities of a reasonable and appropriate standard to be provided to Councillors to support them in undertaking their civic duties

7.3 Ensure accountability and transparency in reimbursement of expenses and provision of facilities to Councillors

7.4 Ensure facilities and expenses provided to Councillors meet community expectations

7.5 Support a diversity of representation

7.6 Fulfil the Council's statutory responsibilities

8 PRINCIPLES

Council commits to the following principles:

8.1 Proper Conduct: Councillors and staff acting lawfully and honestly, exercising care and diligence in carrying out their functions

8.2 Reasonable Expenses: providing for Councillors to be reimbursed for expenses reasonably incurred as part of their role as Councillor

8.3 Participation and access: enabling people from diverse backgrounds, underrepresented groups, those in carer roles and those with special needs to serve as a Councillor

8.4 Equity: there must be equitable access to expenses and facilities for all Councillors

8.5 Appropriate use of resources: providing clear direction on the appropriate use of

8.6 Council resources in accordance with legal requirements and community expectations

8.7 Accountability and transparency: clearly stating and reporting on the expenses and facilities provided to Councillors

9 PRIVATE OR POLITICAL BENEFIT

9.1 Councillors must not obtain private or political benefit from any expense or facility provided under this policy

9.2 Private use of Council equipment and facilities by Councillors may occur from time to time. For example, telephoning home to advise that a Council meeting will run later than expected

9.3 Such incidental private use does not require a compensatory payment back to Council

9.4 Councillors should avoid obtaining any greater private benefit from Council than an incidental benefit. Where there are unavoidable circumstances and more substantial private use of council facilities does occur, councillors must reimburse the council.

9.5 Campaigns for re-election are considered to be a political benefit. The following are examples of what is considered to be a political interest during a re-election campaign:

- production of election material
- use of council resources and equipment for campaigning
- use of official council letterhead, publications, websites or services for political benefit
- fundraising activities of political parties or individuals, including political fundraising events

10 EXPENSES

10.1 GENERAL EXPENSES

10.1.1 All expenses provided under this policy will be for a purpose specific to the functions of holding civic office. Allowances for general expenses are not permitted under this policy.

10.1.2 Expenses not explicitly addressed in this policy will not be paid or reimbursed.

10.2 SPECIFIC EXPENSES

Annual Fees – Chairperson & Councillors

10.2.1 Fees Payable to Councillors – Council shall, prior to 30 June each year, set by resolution, the Annual Fee to be paid, monthly in arrears, to a Councillor for the following year commencing 1 July, provided that such a fee shall be within the Minimum and Maximum. Such payment shall be subject to, and under any specific resolution of GWCC under Section 254A of the Regulations.

10.2.2 Fees Payable to Chairperson – Council shall prior to 30 June each year, set by resolution, the Chairperson's Fee to be paid to the Chairperson for the following year commencing 1 July, provided that such a fee shall be within the Minimum and Maximum. Such payment shall be subject to, and under any specific resolution of GWCC under Section 254A of the Act.

10.2.3 **No deduction under this Policy from Fees –** Unless otherwise provided, the payment of, or reimbursement of expenses and the facilities which may be provided under this Policy, shall be provided without reduction from the Annual Fees payable to Councillors and Chairperson's Fee payable to the Chairperson.

Superannuation

10.2.4 Councils may make payments as a contribution to a superannuation account nominated by their Councillors, starting from the financial year commencing on 1 July 2022. The making of superannuation contribution payments for Councillors is optional and at the Council's discretion. In 2022 Council resolved to make superannuation contribution payments at the amount the council would have been required to contribute under the Commonwealth Superannuation Guarantee (Administration) Act 1992 as superannuation if the councillors were employees of the council.

General Travel Arrangements and Expenses

10.2.5 All travel by Councillors should be undertaken using the most direct route and the most practicable and economical mode of transport.

10.2.6 Each Councillor may be reimbursed for travel expenses incurred while undertaking official business or professional development or attending approved conferences and seminars within NSW. This includes reimbursement:

- For public transport fares
- For the use of private vehicle or hire car
- For parking costs for Council and other meetings
- For tolls
- By Cab charge card or equivalent
- For documented ride-share programs, such as Uber, where tax invoices can be issued

10.2.7 Allowances for the use of a private vehicle will be reimbursed by kilometre at the rate contained in the Local Government (State) Award.

10.2.8 Councillors seeking to be reimbursed for use of a private vehicle must keep a log book recording the date, distance and purpose of travel being claimed. Copies of the relevant log book contents must be provided with the claim.

Interstate, overseas and long distance intrastate travel expenses

10.2.9 In accordance with Section 4, Council will scrutinise the value and need for councillors to undertake overseas travel. Councils should avoid interstate, overseas and long distance intrastate trips unless direct and tangible benefits can be established for the council and the local community. This includes travel to sister and friendship cities.

10.2.10 Councillors seeking approval for any interstate and long distance intrastate travel must submit a case to, and obtain the approval of, the general manager prior to travel.

10.2.11 Councillors seeking approval for any overseas travel must submit a case to, and obtain the approval of, a full council meeting prior to travel.

The case should include:

- objectives to be achieved in travel, including an explanation of how the travel aligns with current council priorities and business, the community benefits which will accrue as a result, and its relevance to the exercise of the councillor's civic duties
- who is to take part in the travel
- duration and itinerary of travel
- a detailed budget including a statement of any amounts expected to be reimbursed by the participant/s.

10.2.12 For interstate and long distance intrastate journeys by air of less than three hours, the class of air travel is to be economy class.

10.2.13 For interstate journeys by air of more than three hours, the class of air travel may be premium economy.

10.2.14 For international travel, the class of air travel is to be premium economy if available. Otherwise, the class of travel is to be economy.

10.2.15 Bookings for approved air travel are to be made through the general manager's office.

10.2.16 For air travel that is reimbursed as council business, councillors will not accrue points from the airline's frequent flyer program. This is considered a private benefit.

Overseas Travel Expenses

10.2.17 In accordance with Section 9, Council will scrutinise the value and need for Councillors to undertake overseas travel. Councils should avoid overseas trips unless direct and tangible benefits can be established for the Council and the local community.

10.2.18 Councillors seeking approval for any overseas travel must submit a case to, and obtain approval of, a full Council meeting prior to travel.

10.2.19 Bookings for approved air travel are to be made through the General Manager's office.

10.2.20 For air travel that is reimbursed as Council business, Councillors will not accrue points for the airlines frequent flyer program. This is considered a private benefit.

Travel Expensed not paid by Council

10.2.21 Council will not pay any traffic or parking fines or administrative charges for road toll accounts

Facilities to Councillors Policy

Accommodation and meals

10.2.22 In circumstances where it would introduce undue risk for a Councillor to travel to or from official business in the late evening or early morning, reimbursement of costs for accommodation and meals on the night before or after the meeting may be approved by the General Manager. This includes where a meeting finished later than 9.00pm or starts earlier than 7.00am and the Councillor lives more than 50 kilometres from the meeting location.

10.2.23 Council will reimburse costs for accommodation and meals while Councillors are undertaking prior approved travel or professional development outside the GWCC distribution area.

10.2.24 The daily limits for accommodation and meal expenses within Australia are to be consistent with those set out in Part B Monetary Rates of the NSW Crown Employees (Public Service Conditions of Employment) Reviewed Award 2009, as adjusted annually.

10.2.25 The daily limits for accommodation and meal expenses outside Australia are to be determined in advance by the General Manager, being mindful of 10.2.24. .

10.2.26 Councillors will not be reimbursed for alcoholic beverages.

Refreshments for Council related meetings

10.2.27 Appropriate refreshments will be available for Council meetings, Council committee meetings, Councillor briefings, approved meetings and engagements, and official Council functions as approved by the General Manager.

10.2.28

10.2.29 As an indicative guide for the standard of refreshments to be provided at Council related meetings, the General Manager must be mindful of Part B Monetary Rates if the NSW Crown Employees (Public Service Conditions of Employment) Reviewed Award 2009, as adjusted annually.

Professional development

10.2.30 Council will facilitate professional development of councillors through programs, training, education courses and membership of professional bodies.

10.2.31 In the first year of a new council term, Council will provide an induction program for all councillors which considers any guidelines issued by the Office of Local Government (OLG).

10.2.32 Annual membership of professional bodies will only be covered where the membership is relevant to the exercise of the councillor's civic duties, the councillor actively participates in the body and the cost of membership is likely to be fully offset by savings from attending events as a member.

10.2.33 Approval for professional development activities is subject to a prior written request to the general manager outlining the:

- details of the proposed professional development
- relevance to council priorities and business
- relevance to the exercise of the councillor's civic duties.

10.2.34 In assessing a councillor request for a professional development activity, the general manager must consider the factors set out in Clause 6.27, as well as the cost of the professional development in relation to the councillor's remaining budget.

Conferences and Seminars

10.2.35 Council is committed to ensuring its councillors are up to date with contemporary issues facing council and the community, and local government in NSW.

10.2.36 The Chairperson, Councillors and Substitute may be nominated and authorised to attend conferences by:

- GWCC, through resolution duly passed in open session at a GWCC Meeting;
- The Chairperson or Deputy Chairperson and General Manager jointly, acting within any delegated authority during Council recess;
- The Chairperson or Deputy Chairperson and General Manager jointly, where such conference is for one day or less or does not involve an overnight stay. The Chairperson or Deputy Chairperson and General Manager jointly nominate and authorise a Substitute to attend any conference in lieu of the Chairperson or a nominated and authorised Councillor.

10.2.37 The conferences to which this Policy applies shall generally be confined to:

- Local Government NSW (LGNSW), Local Government Women's Association (LGWA) and Australian Local Government Association (ALGA) Conferences and special "one-off" conferences called or sponsored by any if those associations.
- Annual conferences of the major Professions in Local Government. Australian Sister Cities Conference.
- Regional Organisation of Councils Conferences.
- Conferences, which further training and development efforts of the Council and of Councillors, or which relate to or impact upon the Council's functions. Conferences or Meetings of Organisations or Bodies to which a Councillor had been elected, or appointed as a delegate or member of GWCC, or the LGNSW, LGWA, or ALGA.

Accompanying person/s expenses

10.2.38 GWCC shall meet the following costs of an accompanying person;
Local Government NSW annual conference – the costs of registration and any official conference dinners of the Chairperson or Councillor's accompanying person in attending the annual conference of Local Government NSW, but excluding any travel expenses, additional accommodation expenses and any optional personal tours which shall be the personal responsibility of the individual Councillor.

Other conferences – Where the Chairperson or Councillor is accompanied at a conference, other than the Local Government NSW annual conference, all costs for, or incurred by, the accompanying person, including travel, any additional accommodation costs, breakfast, meals, registration and/or participation in any conference programs, are to be borne by the Chairperson/Councillor/accompanying person and not by GWCC.

10.2.39 Accompanying person's registrations, or program fees, etc. are to be paid to the conference organiser, at time of registration.

10.2.40 Where GWCC meets, on account, any expenditure or cost on behalf of an accompanying person attending a conference, such expenditure must be repaid to GWCC by the Chairperson or Councillor/accompanying person within thirty days (30) of being invoiced for such expenditure

Information and Communications Technology (ICT) expenses

10.2.41 Council will provide or reimburse Councillors for expenses associated with appropriate ICT devices and services. This may include mobile phones and tablets, mobile phone and tablet services and data, and home internet costs.

10.2.42 Reimbursements will be made only for communications devices and services used for Councillors to undertake their civic duties, such as:

- Receiving and reading Council business papers
- Relevant phone calls and correspondence\
- Diary and appointment management

10.2.43 Councillors may seek reimbursement for applications on their mobile electronic communication device that are directly related to their duties as a Councillor, within the maximum limit.

10.2.44 A Councillor and Chairperson may claim for the reasonable cost of care arrangements, including childcare, care of elderly, disabled and/or sick immediate family members of the Councillor to undertake their GWCC business obligations.

10.2.45 A Councillor and Chairperson may claim reasonable expenses associated with the special requirements of a Councillor or Chairperson such as a disability and access needs to allow performance of normal civic duties and responsibilities.

10.2.46 Council encourages wide participation and interest in civic office. It will seek to ensure council premises and associated facilities are accessible, including provision for sight or hearing impaired councillors and those with other disabilities.

10.2.47 Transportation provisions outlined in this policy will also assist councillors who may be unable to drive a vehicle.

10.2.48 In addition to the provisions above, the general manager may authorise the provision of reasonable additional facilities and expenses in order to allow a councillor with a disability to perform their civic duties.

10.2.49 Councillors who are the principal carer of a child or other elderly, disabled and/or sick immediate family member will be entitled to reimbursement of reasonable carer's expenses for attendance at official business, plus reasonable travel from the principal place of residence.

10.2.50 Child care expenses may be claimed for children up to and including the age of 16 years where the carer is not a relative.

10.2.51 In the event of caring for an adult person, councillors will need to provide suitable evidence to the general manager that reimbursement is applicable. This may take the form of advice from a medical practitioner.

Home office expenses

10.2.52 Each councillor may be reimbursed for reasonable costs associated with the maintenance of a home office, such as minor items of consumable stationery and printer ink cartridges.

11 INSURANCES

11.1.1 In accordance with Section 382 of the Local Government Act, Council is insured against public liability and professional indemnity claims. Councillors are included as a named insured on this Policy.

11.1.2 Insurance protection is only provided if a claim arises out of or in connection with the Councillor's performance of his or her civic duties, or exercise of his or her functions as a Councillor. All insurances are subject to any limitations or conditions set out in the policies of insurance.

11.1.3 Council shall pay the insurance policy excess in respect of any claim accepted by Council's insurers, whether defended or not.

11.1.4 Appropriate travel insurances will be provided for any councillors travelling on approved interstate and overseas travel on council business.

12 LEGAL ASSISTANCE

12.1 Council may, if requested, indemnify or reimburse the reasonable legal expenses of:

- A Councillor defending an action arising from the performance in good faith of a function under the Local Government Act provided that the outcome of the legal proceedings is favourable to the Councillor.
- A Councillor defending an action in defamation, provided the statements complained of were made in food faith in the course of exercising a function under the Act and the outcome of the legal proceedings is favourable to the Councillor
- A Councillor for proceedings before and appropriate investigative or review body, provided the subject of the proceedings arises from the performance in good faith of a function under the Act and the matter has proceeded past any initial assessment phase to a formal investigation or review and the investigative or review body makes a finding substantially favourable to the Councillor.

12.2 In the case of a code of conduct complaint made against a Councillor, legal costs will only be made available where the matter has been referred by the General Manager to a conduct reviewer and the conduct reviewer has commenced a formal investigation of the matter and makes a finding substantially favourable to the Councillor.

12.3 Legal expenses incurred in relation to proceedings arising out of the performance by a Councillor of his or her functions under the Act are distinguished from expenses incurred in relation to proceedings arising merely from something that a Councillor has done during his or her term in office. For example, expenses arising from an investigation as to whether a Councillor acted corruptly would not be covered by this section.

12.4 Council will not meet the legal costs:

- Of legal proceedings initiated by a Councillor under any circumstances.
- Of a Councillor seeking advice in respect of possible defamation, or in seeking a non-litigious remedy for possible defamation.
- For legal proceedings that do not involve a Councillor performing their role as a Councillor.

12.5 Reimbursement of expenses for reasonable legal expenses must have Council approval by way of resolution at a Council meeting prior to costs being incurred.

13 GENERAL FACILITIES FOR ALL COUNCILLORS

Facilities

13.1 Council will provide the following facilities to Councillors to assist them to effectively discharge their civic duties;

- Councillor name badges and business cards
- Secretarial services

- Email address provided to councillors
- GWCC Personal device as requested
- Reasonable stationary costs e.g. letterhead, postage etc.

13.2 All equipment and furniture provided shall always remain in the possession of the Chairperson or Councillor during their term of office, and shall remain the property of GWCC and returned to GWCC in good operational order and condition upon ceasing to hold their position.

13.3 Should the Chairperson and/or Deputy Chairperson so choose, GWCC will provide a mobile phone and will pay half the "Services and equipment rental" costs in accordance with the agreed plan. Call costs in excess of the plan are the responsibility of the user. The Chairperson's and/or Deputy Chairperson plan contribution, and any call charges in excess of the plan, are to be deducted from the user's monthly member's fee payment.

13.4 The provision of facilities will be of a standard deemed by the General Manager as appropriate for the purpose.

14 APPROVAL, PAYMENT & REIMBURSEMENT ARRANGEMENTS

14.1 Expenses should only be incurred by Councillors in accordance with the provisions of this policy will report on the provision of expenses and facilities to Councillors as required in the Act and Regulations.

14.2 Approval for incurring expenses, or for the reimbursement of such expenses, should be obtained before the expense is incurred.

14.3 Monetary limits or standards of facilities/services where applicable are specified in this policy, approval for the following may be sought after the expense is incurred:

- Local travel relating to the conduct of official business
- Carer costs

14.4 Final approval for payments made under this policy will be granted by the General Manager or their delegate.

Direct Payment

14.5 Council may approve and directly pay expenses. Requests for direct payment must be submitted to the General Manager for assessment against this policy.

Reimbursement & Advance Payment

14.6 All reimbursements are subject to the provision of receipts and are on a per Councillor basis.

14.7 An advanced payment must be reconciled by the Councillor and acquitted for by receipts or refund.

Reimbursement to council

14.8 If council has incurred an expense on behalf of a councillor that exceeds a maximum limit, exceeds reasonable incidental private use or is not provided for in this policy:
- council will invoice the councillor for the expense
- the councillor will reimburse council for that expense within 14 days of the invoice date.

14.9 If the councillor cannot reimburse council within 14 days of the invoice date, they are to submit a written explanation to the general manager. The general manager may elect to deduct the amount from the councillor's allowance.

Timeframe for reimbursement

14.10 Unless otherwise specified in this policy, councillors must provide all claims for reimbursement within three months of an expense being incurred. Claims made after this time cannot be approved.

15 PUBLICATION

15.1 This policy will be published on council's website.

16 REPORTING REQUIREMENTS

16.1 Council will report on the provision of expenses and facilities to Councillors as required in the Act and Regulations.

17 APPROVAL ARRANGEMENTS

17.1 All approvals under this Policy shall be made by resolutions of GWCC or jointly by the Chairperson or Deputy Chairperson and the General Manager or as stated in the policy.

18 DISPUTE RESOLUTION

18.1 Where a dispute arises relating to the payment of expenses of the provision of facilities the following procedures will be applied:

Councillor

If a Councillor disputes the method in which this policy has been applied then the matter will be referred to the Chairperson for determination.

Chairperson

If the Chairperson disputes the method in which this policy has been applied then the matter will be referred to the full Council for determination.

19 BREACHES

19.1 Suspected breaches of this policy are to be reported to the General Manager.

19.2 Alleged breaches of this policy shall be dealt with by following the processes outlined for breaches of the Code of Conduct.

GOLDENFIELDS WATER COUNTY COUNCIL – DECEMBER 2022

2022 CUSTOMER SURVEY RESULTS

Report prepared by Community Education and Engagement Officer

COUNCIL OFFICER RECOMMENDATION

ALIGNMENT WITH BUSINESS ACTIVITY STRATEGIC PLAN

Priority 2 Customer Service Focus

BACKGROUND

We recognise our customers and community play a vital role in shaping our future, and only through engaging in meaningful conversations can we understand and achieve our mutual goals.

REPORT

GWCC undertake annual customer surveys aimed at:

- Establishing a baseline for customer satisfaction with water quality and service delivery
- Analysing and understanding our customer's experience when contacting GWCC
- Identifying future priorities and improvement areas
- Measuring the ideal price point for potential future upgrades

This survey was undertaken in house via survey monkey. The survey was opened for a two-week period in September 2022, a total of 69 customers completed the survey online. The survey questions were based around customer service, water quality and service delivery.

The survey was open to all GWCC customers, with the highest number of respondents coming from the Coolamon, Temora and Junee Shires. No responses were received from Hilltops Council or Narrandera Shire.

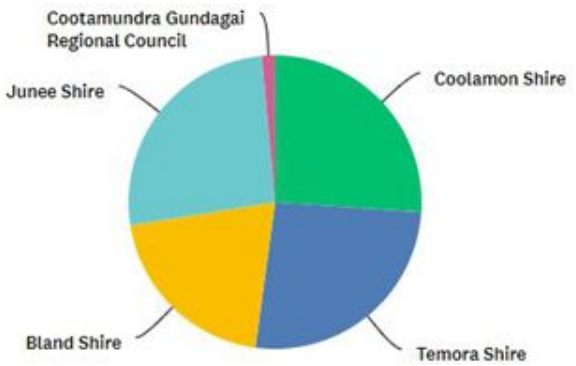
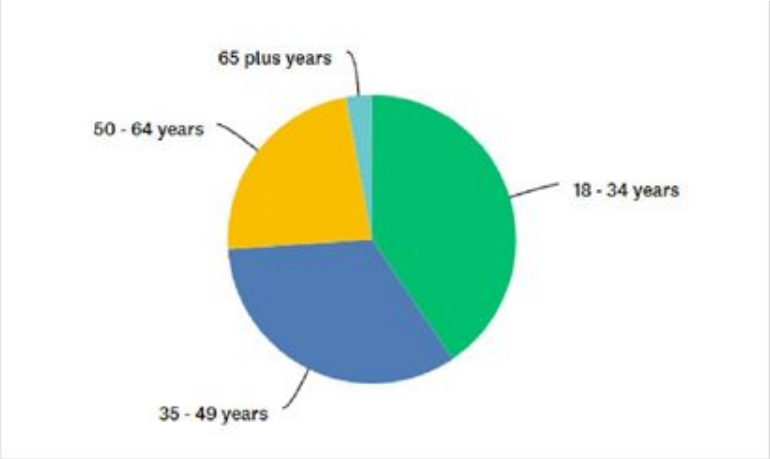


Fig 1.1 – Percentage of respondents received from each LGA

The main age group to complete the survey was 18 – 34 years, followed by 35 – 49 years.



Overall, the quality of water supplied was rated as satisfactory. The attributes to make up the water quality comprised of taste, smell and clarity. 40% of customers were *satisfied*, 26% were *very satisfied*, 16% were *extremely satisfied,* 15% *very dissatisfied* and 3% *extremely dissatisfied.* The two respondents who were *extremely dissatisfied* reside in Temora and Coolamon.

Overall, the quality of service delivery was rated as satisfactory. The attributes to make up the service delivery comprised of water pressure, reliability of accessing water and ease of making payments. 41% of customers were *satisfied*, 26% were *very satisfied*, 29% were *extremely satisfied,* 3% *very dissatisfied* and 1% *extremely dissatisfied.*

A series of questions relating to 'logging a service disruption' were also included in the survey to gauge an understanding on customers experience when contacting GWCC. These questions included *how was the issue logged*; *was this during office hours or after hours; what method was used to report this issue; and how satisfied were you with the timeliness/ability of GWCC to fulfill the request.* 20 out of the 69 respondents indicated that they had previously logged a service issue, with most of them indicating they were either *extremely satisfied* or *satisfied* with the overall service received..

In terms of GWCC communicating any water announcements or updates to customers, the 69 respondents indicated that their preferred method is SMS notification via the Goldenfields Water App, followed by social media then newspaper and letterbox drop.

GWCC listed four potential capital works projects and asked customers a series of questions to understand their propensity to pay for these upgrades. These potential projects included:

- Upgraded water treatment plant for the Oura Scheme to improve water discolouration

- A new water treatment plant for the Mt Arthur scheme to improve water discolouration
- A new mobile pipe cleaning technology system to help minimise discoloured water events and/or severity. New technology will also significantly reduce water loss from manually flushing the pipes
- Additional infrastructure for improving water pressure within Junee township

Customers were asked *if Council were to proceed with any of the above projects, an increase between $25 pa to $150 pa would be required. An increase of $25 pa would allow some projects to be delivered over a longer timeframe whereas $150 pa would allow projects to be delivered in a shorter timeframe.* The average figure for what the respondents thought would be a good value was $51 pa. The average price for what would be considered too expensive was $116 and the average price for what would be considered inexpensive and suggest doubts of quality was $30.

FINANCIAL IMPACT STATEMENT

The recommendation does not impact on Council's financial position.

LOCAL PREFERENCE

NA

ATTACHMENTS: Nil

TABLED ITEMS: Nil

GOLDENFIELDS WATER COUNTY COUNCIL – DECEMBER 2022

COUNCIL RESOLUTIONS UPDATE REPORT

Report prepared by General Manager

COUNCIL OFFICER RECOMMENDATION

That Council note the Council Resolutions Update Report

ALIGNMENT WITH BUSINESS ACTIVITY STRATEGIC PLAN

Priority 1 High Quality, Secure and Efficient Water Supplies

BACKGROUND

The General Manager is responsible for ensuring that Council's resolutions are implemented efficiently and in a timely manner.

REPORT

After a Council meeting is held, actions required from the resolutions made are listed and distributed to the Management Team for their attention. This list is included on the fortnightly Management meeting agenda to ensure timely completion of tasks.

The resolutions update table attached is provided to the Board to deliver an overview of the tasks completed since the previous meeting and to identify any outstanding tasks that still require action. This allows greater transparency for the Board into the actioning of the resolutions made and a timely reminder for Management to progress these actions.

FINANCIAL IMPACT STATEMENT

The recommendation does not impact on Council's financial position.

ATTACHMENTS: Council Meeting Resolution Action Table

TABLED ITEMS: Nil

Goldenfields Water

Council Meeting Action Items

Council

Resolution No.	Resolution	Action Required	Status Update	Responsible Officer
22.076	RESOLVED on the motion of Crs White and Sinclair that 1. The Financial Statements for the year ended 30th June 2022 be referred to Council's Auditor, Audit Office of New South Wales, 2. Council make a resolution in accordance with Section 413(2)(c) that the Financial Statements have been prepared in accordance with: i. the Local Government Act 1993 (NSW) (as amended) and the Regulations made there under ii. the Australian Accounting Standards and professional pronouncements iii. the Local Government Code of Accounting Practice and Financial Reporting iv. presents fairly the Council's operating results and financial position for the year v. accords with Council's accounting and other records vi. that Council is not aware of any matter that would render these statements false or misleading in any way 3. That Council adopt the abovementioned Statement and that the Chairperson, Councillor, General Manager and Responsible Accounting Officer be authorised to sign the 'Statement by Councillors and Management' in relation to Council's 2021/22 Financial Statements and Special Purpose Financial Reports and be attached thereto.	Refer statements to Auditor. Publish audited reports. Present audited reports at the October meeting	Financial Statements scheduled to be presented at the 27 October Council Meeting. Presented. Item Complete.	Corporate Services Manager

Goldenfields Water

Resolution No.	Resolution	Action Required	Status Update	Responsible Officer
	4. The General Manager be delegated the authority to issue the audited Financial Statements immediately upon receipt of the Auditor's Reports, subject to their being no material changes or audit issues. 5. Council present the final audited Financial Statements and Auditor's Report to the public at its ordinary meeting to be held on 27th October 2022.			
22.083	RESOLVED on the motion of Crs White and Sinclair that the Board approve an increase to the operational budget of $135,000 to recommence the implementation of the Emagin product.	Increase operational budget by $135,000	Progressing. To be included in December quarterly budget review.	Corporate Services Manager
22.085	RESOLVED on the motion of Crs McAlister and McGlynn that the Board 1. Pursuant to s55(3)(i) of the Local Government Act 1993, the Board considers that a satisfactory result would not be achieved by inviting tenders before entering into a contract for the purchase of energy, due to extenuating circumstances, being: a. current energy market volatility and significant risk in entering into a fixed agreement b. multiple options for purchasing energy, such as wholesale purchasing c. flexibility in purchasing processes is required for speed of acting on low price demands within the National Energy Market (NEM) 2. authorise the General Manager or their delegate the delegation to negotiate the purchase of energy and enter into any such Agreements necessary to continue the efficient operations of Goldenfields Waters supply network.	Negotiate the purchase of energy and enter into agreement/s as required.	No action at this time.	Production & Services Manager

Goldenfields Water

Resolution No.	Resolution	Action Required	Status Update	Responsible Officer
22.096	RESOLVED on the motion of Crs Sinclair and McGlynn that the Board receives and notes the 2021/22 Audited Financial Statements.	Submit statements to OLG.	No submissions received. Item complete.	Corporate Services Manager
22.099	RESOLVED on the motion of Crs McGlynn and Piper that the Board receives and adopts the Quarterly Budget Review for the period ended 30 September 2022.	Increase Council's Operating Result by $40,000 and increase Capital Works Expenditure by $3,321,000.	Finance records Updated. Item complete.	Corporate Services Manager
22.101	RESOLVED on the motion of Crs McGlynn and McAlister that the Board endorse the updated Statement of Business Ethics	Finalise Policy and Publish	Policy finalised and published. Complete.	Executive Assistant
22.102	RESOLVED on the motion of Crs Sinclair and Piper that the Board adopt the updated Developer Charges Policy PP008.	Finalise Policy and Publish. Reinvite Constituent Councils to engage in an MOU.	Policy finalised and published.	General Manager
22.104	RESOLVED on the motion of Crs McAlister and Sinclair that Council set the meeting schedule as described for the ensuing twelve months.	Public Notice of Dates. Display on website.	Public Notice provided on Goldenfields Water Website. Item Complete.	General Manager
22.105	RESOLVED on the motion of Crs McGlynn and McAlister that Council endorse the office to be closed commencing 12.00pm Thursday 22 December 2022, reopening Monday 9 January 2023.	Advertise Closure. Notify staff of closure.	Staff notified of closure. CEEO notified of requirement to advertise.	General Manager
22.106	RESOLVED on the motion of Crs Piper and Sinclair that Council's 2021/22 Annual Report be received and noted.	Finalise Report. Publicise on web. Provide link to OLG.	Report finalised, published on web, link provided to OLG. Item complete.	General Manager

NEXT MEETING

The next ordinary meeting of Council is scheduled to be held on Thursday 23 February 2023 at 10.00am

CLOSE OF BUSINESS

There being no further business requiring the attention of Council the meeting may be declared closed.