

Warrumbungle Shire Council Improvement Plan

No	Location	Process step	Category	Action	ADWG No.	ADWG Element	Source	Haz ID / Source number	Date added	Priority	Action Owner	Date reviewed	Due date (revised)	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 30/7/2019 & 27/8/2019; 27/09/2019; 13/12/19; 28/2/20; 24/04/2020; 24/7/20; 24/11/20	Short term actions	Resource requirements
5	All	Training		Develop and implement a staff awareness program for relevant water quality obligations relating to their areas of responsibility.	1.2	Regulatory and Formal Requirements			Sep-2015	Medium	Manager Warrumbungle Water; Technical Officer	30-Jul-21	31-Jul-23	implement WO meetings	In progress				Quarterly review meeting to cover water quality obligations, alternate staff attendance at meetings. 28/2/20: To consider schedule of to re-implement water quality meetings 30/7/21: monthly all WW staff meetings held with relevant items brought up on agenda; fortnightly water quality summary circulated to relevant staff; DWMS being updated; WQ still to be re-implemented	Re-implement quarterly meetings (after finalisation of improvement plan). Process to be formalised in updated DWMS (Action 334)	
8	All	Documentation / Protocol		Update stakeholder/relevant agencies list to comprehensively identify all stakeholders who could affect, or be affected by, decisions or activities of the drinking water supplier. Where possible, this list should also identify the accountabilities and responsibilities of relevant agencies in support of the water supplier. This list will be included in this DWMS (in the main body) and maintained as a separate document referenced in Appendix D. It is also recommended that the contact register be inserted on a separate page so that it may be easily printed and posted on workplace walls.	1.3	Engaging Stakeholders			Mar-2015	High	Supervisor Treatment	30-Jul-21	31-Jul-23	complete key suppliers	In progress	A draft ERP was developed by Bligh Tanner in collaboration with Council. Contact registers were developed for each scheme that now need to be completed (need input from operational staff).			Registers have been updated, further review still needed. Finalisation of ERP to be included as part of NSW Health project. ERP responsibility to be allocated, including setting review times 13/12/19: Confirmed that development of ERP is to be undertaken as part of Hunter H20 NSW Health project. 29/2/20 - Lists to be included in DWMS when updated 24/7/20: IRPs workshop held on 2/7; Bligh Tanner work to be provided to HH20 24/3/21: CW to ask CN to add to her task list including finalisation (info from supervisor) + annual or six-monthly review/update 30/7/21: Supervisor Treatment to complete key supplier lists	Following finalisation of ERP, stakeholder lists to be included in DWMS	
10	All	Documentation / Protocol		The water supply system analysis, including the flow charts and catchment characteristics, will be reviewed internally in 12 months, and upon any significant changes to any of the water supply systems. The review process and records of the outcomes of these reviews should be documented.	2.1	Water Supply System Analysis			Sep-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Implemented				Flow chart reviewed as part of quarterly meeting. Flow charts updates in progress		
11	All	Operations		Enter all water quality monitoring data into electronic spreadsheets on a weekly basis. Allows for ease of data processing.	2.1	Water Supply System Analysis			Mar-2015	High	Technical Officer	30-Jul-19			Implemented	This being done by Council's Technical Officer.			All information is being entered electronically		
12	Mendooran	Reservoirs	Investigations	That WSC investigates options to reduce water age in the Coolabah rural residential estate water supply zone. This could include isolation of individual reservoirs i.e. Reservoirs No. 1, No. 2 and/or No. 3, on a seasonal basis to only store water volumes sufficient to meet peak day demands.	2.1	Water Supply System Analysis	Mendooran Boil Water Alert 2017	MBWA2017	2017	Medium	Supervisor South	22-Jan-19			Implemented		Included in S&S funding (R1)				
14	All	Performance monitoring	Documentation / Protocol	The assessment of the water quality performance data should be reviewed every 12 months, and upon any significant changes to any of the water supply systems. Review will assess any seasonal trends, consistent exceedances or other potential water quality issues. The formal review process and records of the outcomes of these reviews should be documented.	2.2	Assessment of Water Quality Data			Sep-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Implemented				Quarterly DWMS reviews undertaken. Fortnightly review of CCP data (exceedance summaries), sent to Supervisors and Manager and reviewed in operations meeting. Monthly report to General Manager of CCP exceedances		
16	All	Performance monitoring		Council to include new operational data prior to review of the DWMS.	2.2	Assessment of Water Quality Data			Sep-2015	Medium	Manager Warrumbungle Water	27-Aug-19			Implemented				Water quality data reviewed as part of quarterly meeting and annual DWMS review report		
24	BWY	Environmental	Minor works	Redirect the drain flow from the soda ash/alum dosing room to the external alum bulk storage bund --> complete Take measurements of the bund wall, the tank and determine the angle from the top of the tank to the bund wall and ensure the bund complies with Australian Standard AS3780 --> measurements taken, volume is sufficient however angle might not Ensure the chlorine room ventilation complies with the requirements of Australian Standard AS2927 --> complete Investigate if the forced ventilation fan needs to be larger to provide adequate ventilation --> complete	2.3	Hazard ID and Risk Assessment	Hunter H20 Audit 2014	BWY012, BWY013, BWY014	2014	High	Supervisor Treatment	30-Jul-21	31-Dec-22	check bunding compliance	In progress	- Any spilled chemical in the soda ash dosing and storage area can potentially drain to the stormwater drainage system - The alum bulk storage bunding area may potentially not comply with Australian Standard AS with regard to appropriate angle from the top of the storage tank to the top of the bund wall - There is limited ventilation in the chlorine dosing room which is a potential safety hazard			Investigation still needed. To be included in treatment plant upgrades Chlorine room items covered under action 329 13/12/19: Have received quotes, sizing to be confirmed. HunterH20 audit to be undertaken next week, HunterH20 to confirm requirements 28/2/20 - see update action 23 24/7/20: chlorine room items addressed (see also action 23); soda ash/alum bunding outstanding 24/11/20: soda ash/alum bunding still required 24/3/21: need to put a sump in dosing room, put sump in and redirect to bunding or to future fluoride room when the chemical tank for it gets installed; comply with AS3780 for bunding still to be confirmed 30/7/21: compliance with AS3780 still to be confirmed (assing to TL Treatment Nth); in case of non-compliance a self-bunded tank would need to be purchased, which could be covered under future funded upgrade works	Investigation to be finalised under the Binraway Water Supply Scheme Business Case	
26	CLH	Disinfection	Minor works	Organise for chains to be installed to secure the cylinders in place and reduce the risk of the cylinders falling over Investigate ventilation requirements as outlined in Australian Standard AS2927. Implement ventilation modification if required to comply with the Australian Standard. This may be achieved through improved forced ventilation or modification to the vents for cross ventilation Chlorine gas is an oxidising agent and sources of fuel should not be stored in the same room. Items stored on the ground in the room poses a trip hazard and should be removed or store in a more tidy manner.	2.3	Hazard ID and Risk Assessment	Hunter H20 Audit 2014	CLH006, CLH007, CLH008	2014	High	Project Engineer	30-Jul-21	31-Dec-21		Complete	- The chlorine gas cylinders are currently not stored in a secure manner. Gas cylinders should be stored securely on the site to reduce the risk of damage to the cylinder or other equipment dosing lines should a cylinder topple over. - There is currently no forced ventilation in the chlorine dosing room. - Redundant equipment and boxes are contained in the chlorine dosing room			Chains have been installed. All other items to be addressed FY19/20 (replace chlorine room). Tender to be developed. 27/9/19 & 13/12/19: need info of equipment to be reused (alarms system + scales) + drone pictures (Coolah) 24/4/20: Cylinders have chains so can be secured 24/7/20: outstanding only is chlorine room upgrade 24/11/20: as above 24/3/21: AM reviewing previously prepared Tech Specs to be able to call RFGs 30/7/21: Project Engineer sent out and receive back RFGs, however insufficient budget - BP report to August 2021 meeting		
28	BAR, CBN	Safety	Operations	Organise routine tagging of portable electrical equipment to reduce safety risks	2.3	Hazard ID and Risk Assessment	Hunter H20 Audit 2014	BAR014, COO015	2014	High	Supervisor Treatment, Director Environment Services	24-Apr-20	31/03/2020		Implemented	No schedule for electrical equipment tagging is currently in place			Manager sent email WHS representative - waiting for reply. 13/12/19: Baradine tagging has been complete. CBN still to be done 28/2/20: CBN still to be done. All depots have been done. Electrician to be engaged for CBN. 24/4/20: Electrician has been engaged	WHS representative to table at next committee meeting. Organise tagging for CBN Director to raise at senior level for issue across Council.	
50	BUG, BDN, KBI	Catchment & Abstraction	Investigations	Private water bore inspections, bore register	3.1	Preventive Measures Risk and Multiple Barriers		1.03	Mar-2015	High	Manager Warrumbungle Water; Technical Officer	30-Jul-21	31-Jul-23	Media Release	In progress	Can we obtain a list of private bores from DPI? Bruce Lamont to advise if DOI can give us a list (Dough Moorty did similar exercise)	contamination from same aquifer		13/12/19: Discussion at Oriana meeting and with NSW Health advised against providing any such communication due to perceived risk. Still considered to be a risk. Comms notice to also consider water security. 24/7/20: no progress; media release recommended 24/3/21: Media release to be prepared; Tech Officer to liaise WaterNSW re bore register & Doug Moorty 30/7/21: private bore inspections not intended; some bore information can be obtained from Water NSW; Media release to be prepared 28/11/22 - bore information to be obtained from Water NSW and bore register to be finalised. 30/5/23 - Meeting with NRAR who will provide updated bore register. Tech Officer to generate private bore register from MinView website	Consider Media / comms for residents on importance of water security and contamination of bores, sustainability. Investigate information available on the subject (Tech Officer)	
53	All	Distribution	Investigations	Identify high risk areas for backflow prevention (i.e. STP)	3.1	Preventive Measures Risk and Multiple Barriers		10.01	Mar-2015	High	Manager Warrumbungle Water; Supervisor Retic; Technical Officer	30-Jul-21	31-Jul-23	ELT report	In progress	Need backflow prevention policy Regulatory services police (that they do it properly); need RPZ register (including inspection intervals) STPs, SPSs, dump points, parks/gardens (chemicals) - standards? Hospitals, dentists.	consultant to develop? Get proposals (e.g. Key environmental) Supervisor North to get proposals/funding (SS follow up with Mark Nave)? Check with regulatory services if this is done		Policy and register and inspection program still to be developed 13/12/19: Engaged consultant, to review documents produced 28/2/20: Policy and procedure produced and reviewed. Council to adopt. Consultant also developing register, which should identify high risk areas. 24/7/20: backflow policy and register drafted, however finalisation cannot occur until fees/charges are clarified and Council internal register set-up + admin resources allocated (Tech Officer position currently vacant) 24/11/20: as above 25/3/21: Tech Officer to finalise register in collaboration with Supervisor Retic (currently vacant); Manager to draft ELT report re implementation recommendations 30/7/21: Backflow policy to be finalised incl backflow register; then communication to owners need to occur re implementation; requires admin support	Tech Officer liaise with consultant and investigate setup register in council systems (Authority)	
72	All	Critical control point		The identification of CCPs and Critical Limits should be reviewed every year, and upon any significant changes to any of the water supply systems. The formal review process and records of the outcomes of these reviews should be documented. The DWMS documentation should also be updated accordingly.	3.2	CCPs			Sep-2015	Medium	Manager Warrumbungle Water	29-Aug-18			Implemented	Complete 2016, due Jan-17			CCP review was performed by Bligh Tanner in January 2016 and documented in the DWMS Implementation Report		
74	BWY, CBN, MDN	Sedimentation	Documentation / Protocol	Establish an Operational Control Point (OCP) for the settling lagoon	3.2	CCPs	Bligh Tanner report Feb-16		Feb-2016	Medium	Supervisor Treatment	30-Jul-21	30-Sep-21	13/3 (long term trends)	Implemented				27/9/19: turbidity, pH (e.g. should be 6-7 if alum is used) 28/2/20: Supervisor to propose OCP (>3 NTU, pH dependent on coagulant) 25/3/21: values determined for each lagoon system; need to be added to CCP reference guide 30/7/21: paper form list (with NTU and pH setpoints) to be forwarded to consultant to include in updated CCP reference guide 7/7/22 - CCP reference guide has been completed and updated by consultant.		
80	All	Training		Relevant staff members must be trained to ensure they understand what the CCPs are and why they are important. This training should include use of the HACCP Summary Tables, associated target, Alert and Critical Limits, as well as the monitoring requirements to ensure the CCPs remain in control.	3.2	CCPs			Mar-2015	High	Manager Warrumbungle Water	30-Jul-19			Implemented	Managers WW - Operations & Special Projects, HR, Supervisors			Staff are trained as part of inductions. When CCPs are changed, updated CCP tables are provided and discussed at quarterly meetings (Supervisor/Team Leaders). Changes are passed on to operators via tool box talks.		
81	Mendooran	Critical control point		That WSC finalise draft CCPs provided the DWMS Implementation Report (Bligh Tanner, 2016) and include an additional WTP Final pH CCP	3.2	Critical Control Points	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Manager Warrumbungle Water	22-Jan-19			Implemented				pH COP introduced for Mendooran WTP. CCP cannot be implemented as pH cannot be controlled, only monitored. COP reference guide and introduction of final pH CCPs/CCPs for Shire outstanding		
89	MDN	Distribution	Documentation / Protocol	Implement a pro-active mains flushing program.	4.1	Operational Procedures	CWT report May-15		May-2015	Medium	Supervisor Reticulation; Technical Officer	30-Jul-21	31-Jul-23	Interim (order and print books)	In progress		(Section 4.3, p.17)		Schedules for Dunedoo still to be developed. 27/9/19: waiting on Graham (flushing points DDO-MDN) 24/4/20: Flushing has been undertaken (exc Coolah and Dunedoo), but not formalised. Marty has picked points for a flushing program for all sites. Schedule to be put into a carbon copy book for each site for implementation 30/7/21: Carbon copy books still to be finalised 30/5/2023 - Mains flushing to be discussed as part of the Mendooran Water Supply Scheme business case	Order and print books	

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96	Coonabarabran	Filtration	Operations	Consider periodic inspection on filter media	4.1	Operational Procedures	Risk assessment	5.01	Mar-2015	Medium	Manager Warrumbungle Water	27-Aug-19			Implemented				Filter inspection carried out in June 2019			
100	Coonabarabran	Distribution	Operations	Consider tanker filling from dead ends (if backflow prevention available)	4.1	Operational Procedures	Risk assessment	10.03	Mar-2015	Medium	Manager Warrumbungle Water	27-Aug-19			Implemented		Note: Especially relevant during times of water restrictions		Weekly flushing program in Coonabarabran (while high level restrictions are in place)			
102	Mendoo	Documentation / Protocol	Documentation / Protocol	That WSC review its current organisational structure with a view to ensure that the management of WTP Operators and reporting lines of communication actively support the ongoing implementation of its DWMS and CCPs. WSC should then formally document the adopted organisational structure, clearly communicating roles and responsibilities of all staff relating to the management of drinking water quality.	4.1	Operational Procedures	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Manager Warrumbungle Water	22-Jan-19			Implemented		Draft structure water and wastewater has been developed, discussed and partially implemented					
118	Coonabarabran	Catchment & Abstraction	Monitoring	Consider turbidity monitoring of infiltration well water and river water on event basis to determine effectiveness of filtration	4.2	Operational Monitoring	Risk assessment	1.02	Mar-2015	Medium	Manager Warrumbungle Water	27-Aug-19			Implemented				Combined raw water testing daily undertaken of current water source (NTU, pH, colour). Raw water quality assurance program in place (micro, chemicals) for all bores as part of NSW Health funding.			
119	Coonabarabran	Catchment & Abstraction	Monitoring	Consider testing for E. coli in raw water	4.2	Operational Monitoring	Risk assessment	1.04	Mar-2015	Medium	Manager Warrumbungle Water	27-Aug-19			Implemented				Raw water quality assurance program in place (micro, chemicals) for all bores as part of NSW Health funding.			
121	CBN	Coagulation & Flocculation	Monitoring	Monitor algae concentrations in the raw water and sedimentation lagoon. -> part of RWQ procedure (algae torch to be purchased) Action 248: Operators to re-familiarise themselves with BGA Management Protocols and related response actions. -> part complete (charts on CBN WTP wall) Action 292: Consider additional testing for taste and odour issues (MIB and Geosmin, chlorophyll-a (algae), pH, organic loadings and nutrient levels)	4.2	Operational Monitoring	CWT report May-15		May-2015	Medium	Supervisor Treatment	30-Jul-21	31-Jul-23		In progress			(Section 4.2.2, p.10)	BGA testing during summer period in raw water. 27/9/19: will test monthly in lagoons over summer 13/12/19: Have been using PAC. Testing not yet undertaken 24/4/20: Only raw water testing undertaken. Testing of lagoon not yet tested. No taste and odour complaints. PAC being dosed at Coonabarabran. Further investigation into taste issues needed. 30/7/21: algae torch purchased in FY20/21, operation to be implemented and recording to be added to spreadsheet prior to spring; BGA charts still to be deployed at BWY/MDN WTPs; A292 still outstanding, however carbon implemented for taste & odour in CBN	Add testing of sedimentation lagoons in warmer months (from December) as per BGA tests in raw water quality monitoring program. To be included in operational monitoring plan. Operators to re-familiarise themselves with BGA Management Protocols and related response actions. Further investigation needed for taste and odour issues		
122	CBN, BDN	Reservoirs	Monitoring	Consider implementing sampling regime for CBN, BDN for chlorine residual in the reservoirs	4.2	Operational Monitoring	Risk assessment	9.02	Mar-2015	Medium	Technical Officer	30-Jul-21	30-Jun-21		Implemented				Coonabarabran now (August 2019) recording chlorine residual testing of reservoirs (recorded weekly). 27/9/19: BDN flushing sheet not yet printed (waiting on sheets from Dunedoo) 24/4/20: BDN flushing sheets still to be printed 25/3/21: chlorine recorded as part of weekly reservoir inspections; slot to be added on Ops carbon copy books to record chlorine residual 30/7/21: updated carbon book still outstanding for BDN (meanwhile weekly recordings on comments section of ops log sheet)	Baradine monitoring flushing sheet to be amended to include chlorine residual monitoring of reservoirs.		
129	Mendoo	Disinfection	Minor works	That online turbidity and chlorine residual monitoring is installed at Mendooran WTP.	4.2	Operational Monitoring	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Supervisor South	22-Jan-19			Implemented		Safe & Secure - draft funding deed is in preparation					
133	Mendoo	Vegetation Control	Operations	Maintain vegetation control throughout the water plant grounds and particularly around the sedimentation lagoons.	4.3	Corrective Action	DPI Inspections	DPI MEN008	Jan-2019	Medium	Supervisor South	27-Aug-19			Implemented		Cumbungi particularly should be kept out of the lagoons by physical rer		Vegetation is mowed, weeds pulled. Lagoon weeds removed with excavator when desludge			
137	Mendoo	Documentation / Protocol	Documentation / Protocol	That WSC review the LMWUA Water Treatment Plant Audit Report for the Mendooran WTP (September 2014), develop an Action Plan and urgently implement any outstanding recommendations. This Action Plan information should also be regularly reported back to DPI-Water.	4.3	Corrective Action	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Manager Warrumbungle Water	22-Jan-19			Implemented		6 of 15 completed, 8 in progress, 1 outstanding. All to be included in DWMS Improvement Plan					
140	BUG, DDO, KBI	Environmental	Minor works	Install an appropriate containment bund around the dosing tank to capture any chemical leaks or spills during pump operation or transfer of hypo	4.3	Corrective Action	Hunter H2O Audit 2014	BUG006, DDO009, KBI006	2014	Medium	Supervisor Treatment	30-Jul-21	31-Jul-23	KBI	In progress	Kenebi, Dunedoo and Bugalide are all being converted to chlorine gas disinfection systems, once implemented no bunding system will be required.	There is no chemical bund in the chlorine dosing/bore room. Chemical leaks and spills will not be contained and increases the risk of release to the environment.	Dunedoo - 19/20 FY chlorine upgrade to gas 27/9/19: BUG/KBI: 200L mix tanks (diluted 20:1, 10:1 in summer with 20L 13% drums) 24/4/20: DDO moving to chlorine gas. 30/7/21: not enough room in BUG to fit bund tank (shed could be replaced with a bigger one or extended); DDO will be upgraded with currently existing equipment from Coolah once the chlorine room has been replaced (A?); KBI to purchase bund tank to install under dosing tank 3/05/2023 - All sites to be upgraded to chlorine gas	Purchase bunding for tanks (BUG, KEN)			
145	CBN	Documentation / Protocol	Documentation / Protocol	Continue developing the existing asset registers to develop an electronic database that includes details such as: age of infrastructure; expected life; last service date; maintenance frequency; manufacturer; recorded failures; responsibility for maintenance; operational procedures; and records for maintenance of equipment (including calibration). This should include any monitoring instrumentation.	4.4	Equipment Capability & Maintenance			Sep-2016	Low	Manager Warrumbungle Water	30-Jul-21	TBD		In progress				5 yearly evaluation of asset evaluations (last FY16/17) 24/4/20: Asset register is updated annually following completed capital projects. 24/11/20: Warrumbungle Water has no AMPs and currently no steps are taken for those to be developed, this however has been a recommendation to the S430 OLG investigation report 30/7/21: as above; it has 3/5/2023 - Asset Management Plans to be developed by the asset steering committee. Council has a complete list of APV spreadsheets for both water and sewer assets	Asset management plan & registers to be developed.		
175	All	Distribution	Major works	Replace old water meters with new water meters including backflow prevention devices	4.4	Equipment Capability & Maintenance	Risk assessment	10.01	Mar-2015	Medium	Manager Warrumbungle Water	27-Aug-19			Implemented				Program of replacement of water meters in place (1/3 to be completed FY19/20)			
177	Mendoo	Reservoirs	Minor works	That WSC investigates the installation of an inline booster pumping station on the outlet of the Standpipe reservoir to provide sufficient water pressure for a regular watermain flushing program to be implemented, to improve the water supply system's firefighting capacity and reduce overall water age by only storing water volumes sufficient to meet peak day demands.	4.4	Equipment Capability and Maintenance	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Supervisor South	22-Jan-19			Implemented		Included in S&S funding (R1)					
189	BWY	Filtration	Operations	Ensure Differential Pressure cells are functional and reading correctly. Modify PLC code to allow filter backwashes to be initiated by either filter run time, filter headloss or filtered water turbidity	4.4	Equipment Capability and Maintenance	Hunter H2O Audit 2014	BWY006	2014	Medium	Supervisor Treatment	30-Jul-21	31-Jul-23		In progress	To be completed under WTP upgrade funding deeds	Filter backwashes are only initiated by the filter run time setpoint regardless of the filter performance		24/4/20: PLC upgrades in budget for next financial year. Can add headloss, this will require metering. 30/7/21: PLC upgraded, however additional programming/hardware purchase (DP cells) not yet undertaken 3/5/2023 - this is to be addressed under the proposed upgrades to the Binnaway water supply scheme funded by the SSWP.	To be included as part of treatment plant upgrade		
191	BAR, BWY, CLH	Laboratory equipment	Operations	Perform appropriate scheduled maintenance and calibration of lab equipment according to the equipment manufacturer/supplier's recommendations	4.4	Equipment Capability and Maintenance	Hunter H2O Audit 2014	BAR013, COO014, BIN011	2014	High	Supervisor Treatment, Technical officer	24-Jul-20	30/04/2020	To undertake calibrations	Implemented	Minimal or no maintenance is carried out by the operators			Annual maintenance and calibration is being carried of instruments and lab equipment, undertaken by contractors (last done in May - due to be completed) 27/9/19: AM had sent new bores equipment to SS but still need model numbers; SS to liaise with supervisors to that list for quotes can be compiled (excluding equipment that we calibrate ourselves) 13/12/19: Quote has been received, Partial list has been compiled. SS to add remaining locations and check with Supervisors 28/2/20: Internal board set up at CBN of frequency of maintenance and calibrations for operators to undertake and sign off on. To be set up at all sites. Photos to be taken regularly of board to ensure records of compliance. List has been compiled and quotes received. Contractor to be engaged and date scheduled for works 24/7/20: IPAC calibrations completed in March	Take photos (Supervisor) of calibration and maintenance boards and setup folder for photos in InfoXpert, e.g. "Instrument and equipment maintenance" under DWMS (Tech Officer) -> will go Jacinta's task list		
195	MDN	Disinfection	Operations	Commence regular chlorine batch concentration monitoring.	4.5	Materials & Chemicals	CWT report May-15		May-2015	Very High	Supervisor Treatment	30-Jul-21	30-Sep-21		Implemented	System to be converted to chlorine gas with Mendooran WTP upgrade (Section 4.2.5, p.16 of CWT report) 2018-05: Operator requires on-site training; Supervisor South: SS do drop tests with Stephen Drew (do each time when dose rate is changed, e.g. when swap river/bore water; min weekly)	should test what we receive + do drop test on pump + check PLC; need updated operational sheet; check PLC code for correct dose rate	Operators are testing when chemicals received. 27/9/19: GR to notify SD + verify that there is room in log book (SS) 13/12/19: Investigating equipment to test batch chlorine 28/2/20: Still to be investigated, procedure to be developed and staff to be trained. Long term to be replaced by gas. 24/7/20: HH2O sent through an easy procedure, however implementation/operator training outstanding (result will be put in comments section on spreadsheet); to be done weekly 24/11/20: no progress 23/3/21: further operator training required + to be scheduled 30/7/21: TL Treatment Nth to follow up on/continue operator training	Procedure to be formalised (including space for test to be recorded and frequency); Supervisor to review action plan on a regular basis, at least monthly			
200	Mendoo	Distribution	Operations	Operators should be filling out the plant record sheets. Where equipment is not working or requires replacement/repair, this should be done as a matter of priority. This includes the following: 1. pH meter, 2. pH buffers, 3. Chlorine test reagents, 4. On line raw water turbidity meter.	5.1	Drinking Water Quality Monitoring	DPI Inspections	DPI MEN010	Jan-2019	High	Supervisor South	27-Aug-19			Implemented		The current level of plant performance recording at the plant is unsatisfactory.		Plant records are now being filled out. Supervisor and Technical Officer review that sheets are completed.			
205	All	Documentation / Protocol	Documentation / Protocol	That WSC develop and implement a "Drinking Water Quality Monitoring Plan" which formalise staff/role responsibilities, authorities reporting and communication protocols and review existing procedures for sampling and testing. The monitoring plan should be built based on the NSW Health Drinking Monitoring Plan (available on the NSW Health website).	5.1	Drinking Water Quality Monitoring	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Manager Warrumbungle Water	30-Jul-21	TBD		In progress		DWQ Monitoring Plan		13/12/19: Consultant has provided a proposal to develop verification proposal 24/7/20: dependant on 206 25/3/21: as above (can get consultant to do DWQ Monitoring Plan once we have Verification Plan)	To follow on from action 206 Engage consultant to develop verification monitoring plan	Consultant	
206	All	Documentation / Protocol	Documentation / Protocol	Formally document all drinking water quality monitoring protocols and combine into a formal Water Quality Verification Plan. Including (A294): There was discussion around who collects the reticulation samples and analyses them before they are sent to FASS. The Councils Environmental Health Office collects and tests the samples. There have been some issues with samples being collected at the wrong location. It was recommended that Council develop a procedure that includes photos and GPS locations to ensure that samples are always collected at the correct location.	5.1	Drinking Water Quality Monitoring			Mar-2015	High	Environmental Compliance Officer	30-Jul-21	TBD	Interim (new sampling sites)	In progress				Information for plan is in process of being collected. 27/9/19: info needs to go on T-drive; some photos still need to be taken; sample sites require updating (+photos added) + incident flowcharts added 13/12/19: Proposal from consultant to develop verification proposal 28/2/20: No progress 24/7/20: Jacinta Green (consultant) to address - CW needs to engage, meanwhile WQ monitoring protocol to be updated by JG (Tech Officer interim) with AM and Jesse R 25/3/21: Supervisor Treatment/Retic (currently vacant) to liaise with EHO (currently vacant) and NSW Health on new sampling sites (sampling at mains); from the WQ Verification Plan can be developed/finalised by Tech Officer/EHO; refresher on DW sampling for rangers and other Ops staff being arranged	Develop draft Water Quality Verification Plan with site locations (and photos). Investigate changing site numbers in NSW Health database. Engage consultant to develop verification monitoring plan (A205)		
207	BAR, BIN, CBN	Fluoridation	Operations	Confirm process on extracting data from NSW Health Water Quality Database	5.1	Drinking Water Quality Monitoring	Risk assessment	8.01	Mar-2015	High	Technical officer	30-Jul-19			Implemented				Data is downloaded from database and uploaded onto Councils website on a monthly basis by the Technical Officer			

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208	Mendoo ran	WTP	Operations	Perform jar tests to determine optimum coagulant dose rates and mixing configurations. Investigate (by performing jar tests) using separated dosing diffusers for improved efficiency of both coagulation and metal removal	5.1	Drinking Water Quality Monitoring	Hunter H2O Audit 2014	MEN006	2014	Medium	Supervisor South	27-Aug-19			Implemented		Poly aluminium chloride and potassium permanganate are both dosed through the same diffuser into the top of the aeration stairway		Currently undertaking jar tests. Draft jar testing SOP has been developed. Jar testing training to be undertaken at Coonabarabran (September 2019)		
210	CLH	Information Systems	Operations	Implement routine monitoring of daily and instantaneous chlorine gas usage and plant flow rates. Perform calculations to determine instantaneous and daily chlorine dose rate. Installing scales for the chlorine cylinders to stand on will allow for daily chlorine usage to be measured. --> complete	5.1	Drinking Water Quality Monitoring	Hunter H2O Audit 2014	CLH004	2014	High	Supervisor Treatment Technical officer	30-Jul-21	31-Oct-21		Complete	Chlorine gas and treated water instantaneous flow rate measurements are not being recorded when operators are onsite. Measuring and monitoring of instantaneous chlorine dose rate and plant flow can provide confirmation of chlorine dose rate		Scales have been installed. Daily monitoring in reticulation. 28/2/20: Flow is being recorded when operators are onsite (has been for some time). Coolah flow is not variable unless change bore source (diff pump). 24/7/20: to be included in next update of carbon copy books, can be recorded in comments section meanwhile - for this new calculation in spread sheet required 24/11/20: chlorine gas bottle weights meanwhile recorded on daily ops sheets; Ops sheet to be update (+ down the track: carbon copy books) 25/3/21: with currently recorded data, daily usage can be recorded; operators to record instantaneous chlorine dose rate on site --> Supervisor to liaise with Tech Officer for spreadsheet calculations; future carbon copy books have been agreed on; will be easier with telemetry in place 30/7/21: formula for daily usage to be added to Tech Officer ops record sheet; rotameter on site for instantaneous rate - need to set up another column on carbon copy book		Bottle weights to be recorded on sheet and calculation added. Supervisor and Tech Officer to review and update sheet.	
211	Mendoo ran	Iron and manganese issues	Operations	Perform jar testing to determine optimum manganese removal dosing configurations	5.1	Drinking Water Quality Monitoring	Hunter H2O Audit 2014	MEN009	2014	High	Supervisor South	27-Jun-19			Implemented	The plant experiences high manganese levels			Implemented from December 2017		
214	BUG, KBI	Routine testing	Monitoring	Initiate daily sampling and testing of the town distribution system. Tests should include free chlorine residual, pH and turbidity. This will improve response times to water quality issues. Data collected can also be used for future planning and adjustments to the daily operating set points.	5.1	Drinking Water Quality Monitoring	Hunter H2O Audit 2014	BUG005, KBI005	2014	High	Supervisor Treatment, Technical Officer	30-Jul-21	31-Jul-23		In progress	To ensure treated water quality complies with the Australian Drinking Water Guidelines (ADWG), water quality monitoring of the town distribution system must occur. Currently chlorine residual levels are measured weekly			Currently being undertaken 2-3/week. Chlorine analysers are installed, to be bought online. 13 December 2013: Analysers have been installed, not yet linked to shut pump down 28/2/20: Analysers to be linked to telemetry at the end of next week and text message alarm sent. 24/7/20: BDN operator going out 3 x week to test water at bore + 1 x week in retic (pH/chlorine; NTU to be added - instrument to be provided & to be recorded on spreadsheet); chlorine analysers set-up to send text message alarms (interlock with bore pump hence not required) 24/11/20: NTU meter available now (as well as pH meters), Tech Officer to create carbon copy books for BUG/KBI (currently only one space on CBN sheet for chlorine read weekly); bore flow reading will be recorded as well 25/3/21: AM to liaise with FS (new Tech Officer) on the proposed new books 30/7/21: once telemetry is up and running, chlorine, pH and temperature will be online; turbidity will be nearby measured on site once/week (templates done for new carbon copy books) as the small scheme does not justify operator involvement more than that.		Develop new carbon copy book for BUG/KBI each with pH/chlorine/NTU (can be left on site - include flow meter in future) - AM will forward draft to Tech Officer
222	All	Information Systems	Operations	Implement regime of regular (daily) review of raw and treated water quality results, and input operational data into an electronic spread sheet to facilitate analysis and reporting.	5.3	Short-term evaluation of results			Mar-2015	High	Manager Warrumbungle Water	30-Jul-19			Implemented				Data entered electronically. Daily review of data by operator (manual highlighting of data outside trends) Fortnightly review of CCP data (exceedance summaries), sent to Supervisors and Manager and reviewed in operations meeting. Quarterly DWMS reviews undertaken Monthly report to General Manager of CCP exceedances. Action to formalise schedule covered under action 285.		
227	All	Documentation / Protocol	Documentation	Develop a comprehensive public and media communications strategy and include draft public and media notifications.	6.1	Communication			Jun-2015	Medium	Manager Warrumbungle Water; Admin Support	03-Aug-21	TBD		In progress				24/4/20: Carol (Admin support) to arrange the development of a communications strategy (to include restriction advice) 3/8/21: with resignation of Coolah admin officer no admin support available any longer to WW --> will need to outsource to consultant in liaison with Manager Corporate		
240	All	Training	Training	All water management stakeholders must read and agree to abide by the principles of this DWMS. This includes adding this requirement to the role descriptions for Council employees moving forward.	7.1	Employee Awareness and Involvement			Jun-2015	Medium	OD	03-Aug-21	TBD		In progress				13/12/19: Previous quarterly water quality meeting have discussed importance DWMS. More recently facilitated improvement meetings have been undertaken for Supervisors/Managers 24/4/20: Some position descriptions include reference to ADWG. Water quality awareness training to be carried out. Proposal received by consultant. 25/3/21: DWMS reference has been added to all PDs as part of re-structure 3/8/21: Final PDs did not appear to have relevant requirement in them - OD to adjust		
241	All	Documentation / Protocol	Documentation	Consider developing operators communication strategy	7.1	Employee Awareness and Involvement			Jun-2015	Medium	Manager Warrumbungle Water	03-Aug-21	TBD		Complete				24/4/20: Proposal received by consultant. Roadmap to be developed about how information is handed over to operators. E.g. what information requires formal handover and documentation. 3/8/21: formalisation of strategy outstanding		
243	MDN	Training	Training	That WSC investigate and implements a process of its WTP operators to be certified under the National Certification Framework.	7.2	Employee Training	Mendooran Boil Water Alert 2017	MBWA2017	2017	Medium	OD	03-Aug-21	TBD		In progress	This is being organised and actioned through OWUA			Ongoing with HR 13/12/19: Currently reviewing competencies and aligning with national certification framework, processes to identify any shortfalls in training 24/4/20: Review has been undertaken and training plans have been developed. Sign off still to occur. 24/11/20: CK?? covered under other action 3/8/21: update from 04-2021 was "Sourcing certification training was impacted by Covid in 2020 however Council believes it has not sourced a suitable provider and expects to have the training delivered to staff and have met or be close to meeting its certification target by the end of the 2020-2021 FY		
244	Mendoo ran	Disinfection	Documentation / Protocol	That the Human Resources records for relevant staff are reviewed, and that training is undertaken for all water supply operational staff, WTP operators and relief staff to upskill and to be appropriately trained in WTP processes (i.e. DPL-Water Part 1 and 2 as a minimum). It is also recommended that all staff involved with water quality sampling, testing and monitoring, undergo training and are involved in developing procedures for their work tasks.	7.2	Employee Training	Mendooran Boil Water Alert 2017	MBWA2017	2017	Medium	Manager Warrumbungle Water; HR	22-Jan-19			Implemented		Referred to HR				
247	BIN, BAR, MDN	Whole of System	Documentation / Protocol	Review staff structure of water services team, PHU and NOW to provide support	7.2	Employee Training	Risk assessment	11.06	Mar-2015	Medium	Manager Warrumbungle Water	24-Apr-20	20-Jun-20		Implemented				Review on staff structure has been undertaken and revised structure is being implemented. 24/4/20: Restructure in Dec 2020. Issue from 2014 risk assessment on reporting have been rectified, action considered to be implemented.		
249	All	Operator training	Training	Arrange for operators to undertake appropriate training	7.2	Employee Training	Hunter H2O Audit 2014	COH001, DUN001	2014	High	Supervisors/ Manager /HR	24-Nov-20	31/03/2021		Implemented	Operators have not yet completed their fluoridation certification and/or require further training in WTP operations			Confined space and working at heights undertaken 2019. Other training gaps to be reviewed. Manager has requested training schedule from HR. 13/12/2019 Currently reviewing competencies and aligning with national certification framework, processes to identify any shortfalls in training 28/02/20: Are progressing the review with NCF. Have determined competency requirement for each plant determined by plant complexity/treatment. Gap analysis and training plan still to be completed. action 242 closed as considered as covered by this action. 24/7/20: requirements as per NCF included in PDs; fluoridation going to be covered as part of funded NSW Health/H2O project; HR developed training plan 24/11/20: implemented		Review training requirements for Mendooran staff following restructure (action 242)
251	All	Documentation / Protocol	Documentation	Develop a consumer information program providing details on the DWMS, Emergency Response Plan, consumer responsibilities, how drinking water quality may be affected in household distribution and drinking water uses etc.	8.2	Communication			Sep-2015	Medium	Manager Warrumbungle Water	24-Apr-20			Implemented				24/4/20: Four monthly improvement plan update reports are made available on Councils website. General information included on water treatment, including micro, chemical data; water complaint procedure.		
252	All	Performance monitoring	Monitoring	Increase review of water quality performance and utilisation of water quality data to improve understanding of the effectiveness of treatment and to identify water quality trends and patterns.	9.1	Investigative Studies & Research Monitoring			Sep-2016	Low	Manager Warrumbungle Water	27-Aug-19			Implemented				Quarterly DWMS reviews undertaken Fortnightly review of CCP data (exceedance summaries), sent to Supervisors and Manager and reviewed in operations meeting. Monthly report to General Manager of CCP exceedances. Annual review report.		
255	All	Catchment & Abstraction	Investigations	Consider undertaking chemical testing on groundwater supplies to establish baseline water quality	9.1	Investigative Studies & Research Monitoring	Risk assessment	1.07	Mar-2015	Medium	Manager Warrumbungle Water; EHO; Technical Officer	30-Jul-19			Implemented				Raw water testing regime program has been developed and implemented.		
265	Mendoo ran	Distribution	Documentation / Protocol	That WSC review and regularly revise these water supply reticulation plans (Figures 4 & 5) as required to maintain an up to date records.	10.1	Management of Documentation and Records	Mendooran Boil Water Alert 2017	MBWA2017	2017	Medium	Supervisor South; GIS Officer	22-Jan-19			Implemented		In collaboration with Council's GIS Officer				
266	All	Documentation / Protocol	Documentation	Continue to document information pertinent to all aspects of drinking water quality management.	10.1	Management of Documentation & Records			Sep-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Implemented						
268	All	Documentation / Protocol	Documentation	Develop a records management process to ensure appropriate storage and accessibility of DWMS related records. Including (A264): Review existing documentation on the water supply systems and ensure all are captured on Council's document management system. Verify documents are UpToDate.	10.1	Management of Documentation & Records			Sep-2015	Medium	Manager Warrumbungle Water	03-Aug-21	TBD		In progress				24/4/20: Procedure (Drinking water management system document register procedure) has been developed. Still to be reviewed and implemented 3/8/21: additional admin support required to implement and abide by formalised DWMS records requirements		Procedure to be reviewed and implemented
274	Mendoo ran	Documentation / Protocol	Documentation	That WSC undertake an annual internal review of its DWMS, using the HH2O revised NSW Health's annual report template and consult their local PHU to develop an appropriate external review/audit frequency.	10.2	Reporting	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Manager Warrumbungle Water	22-Jan-19			Implemented		Quarterly internal reviews undertaken				
275	All	Documentation / Protocol	Documentation	Develop inhouse evaluation of long-term water quality performance procedures (outside external monitoring requirements) and implement these procedures. These procedures could be incorporated into the preparation process for the annual management review or as part of the internal audit process.	11.1	Long-Term Evaluation of Results			Sep-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Implemented				Annual review 6 monthly level of service report (non compliances, boil water alerts etc.) Quarterly DWMS reviews undertaken Fortnightly review of CCP data (exceedance summaries), sent to Supervisors and Manager and reviewed in operations meeting. Monthly report to General Manager of CCP exceedances		
276	All	Documentation / Protocol	Documentation	Ensure all handwritten water quality data is captured in electronic spreadsheets.	11.1	Long-Term Evaluation of Results			Mar-2015	High	Manager Warrumbungle Water	30-Jul-19			Implemented						
278	All	Investigations	Investigations	Identify appropriate personal to undertake the internal audit and provide training in auditing.	11.2	Audit of Drinking Water Quality Management			Sep-2015	Low	Manager Warrumbungle Water	24-Apr-20	TBD		In progress				3/5/23 - Consultation started with NSW Health		
280	All	Documentation / Protocol	Documentation	Develop external audit procedures in consultation with NSW Public Health Unit.	11.2	Audit of Drinking Water Quality Management			Sep-2015	Low	Manager Warrumbungle Water	24-Apr-20	TBD		In progress				3/5/23 - Consultation started with NSW Health		
281	Mendoo ran	Documentation / Protocol	Documentation	That WSC develop and implement a DWMS review and continual improvement program which is regularly reviewed by the Senior Executive Team and reported to Council.	12.1	Review by Senior Executive	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Manager Warrumbungle Water	22-Jan-19			Implemented				Improvement Plan is under review, to be discussed in details at next DWQ review meeting		

No	Location	Process step	Category	Action	ADWV No.	ADWV Element	Source	Haz ID / Source number	Date added	Priority	Action Owner	Date reviewed	Due date (revised)	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 30/7/2019 & 27/8/2019; 27/09/2019; 13/12/19; 28/2/20; 24/04/2020; 24/7/20;	Short term actions	Resource requirements
282	Mendooran		Documentation / Protocol	That notices received from DPI-Water should be regularly reported to senior management together with an Action Plan, Works Budget and Timeline for the rectification of issues raised during DPI-Water Inspections. This Action Plan information should also be regularly reported back to DPI-Water and NSW Health.	12.1	Review by Senior Executive	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Manager Warrumbungle Water	22-Jan-19			Implemented		List of recommendations created	outstanding has been			
283	Mendooran		Documentation / Protocol	That WSC review and update the DWMS and the "DWMS Improvement Plan" is then kept up-to-date, recommended improvements are implemented in the order of identified urgency and progress of the "DWMS Improvement Plan" is reported regularly to the Senior Executive Team and Council. This information should also be passed onto NSW Health and DPI-Water for advice, review and comment. (Noting that actions from many of the other Recommendations in this report would need to be included in this DWMS Improvement Plan)	12.1	Review by Senior Executive	Mendooran Boil Water Alert 2017	MBWA2017	2017	High	Manager Warrumbungle Water	13-Dec-19	31-Oct-19		Implemented	Improvement plan is being consolidated		Refer to R11 and R12	Improvement plan has been consolidated. Plan to be provided to NSW Health as part of annual review. Quarterly updates to be provided to Council. 13/12/19: Improvement plan and annual review report have been provided to NSW Health		
286	All		Documentation / Protocol	Update and review Implementation Plan when necessary. Follow up actions to ensure deadlines are met and responsible parties are capable to undertake these actions.	12.2	Drinking Water Quality Management Improvement Plan			Sep-2015	Medium	Manager Warrumbungle Water	30-Jul-19			Implemented				Plan has been compiled and in process of reviewing.		
289	All	Disinfection	Training	Training needs to be undertaken on the chlorine test kits to ensure operators are aware of the different testing ranges.			July 2018 ORANA meeting	WarrumSCJul18.3	Jul-2018	High	Technical Officer	27-Aug-19			Implemented				Technical officer provided SOPs, training and necessary reagents to operators.		
297	ALL	Reticulation	Major works	There are a number of old cast iron mains that cause issues (corrosion, low chlorine residuals). Some of these mains are being replaced, consider developing a program/funding for replacing more of these sections of these mains.			March 2018 ORANA meeting	WarrumSCMar18.4	Mar-2018	Medium		27-Aug-19			Implemented				Program of replacement of mains is in place		
327	BWY	Filtration		Investigate filter outlet valve replacement (spare valve sitting on site)			27 June 2019 Improvement Plan review meeting	A3	27-Jun-19	Low	Supervisor Treatment	03-Aug-21	31-Jul-23		In progress	To be implemented as part of the WTP upgrades.			Not yet installed. 24/4/20: In progress (wiring done) 3/8/21: electrical control cabinet installed near filter, requires interal filter level sensors to actuate valve; local electrician consulted 3/5/2023 - To be replaced as part of the funded upgrades to the Binnaway Water Supply Scheme		
328	All	Instrumentation		Process monitoring, automation and instrumentation project. *Council should strongly consider investing in online monitoring at all CCPs (A13 - BWY NTU, A124& A258) --> 24/11/20: only looking at filtration (NTU) and disinfection CCP, for CLH/DDO currently only considering retic CCP - all expected to be complete by 31/12/21 *Consider implementing online monitoring of critical water quality parameters including (A212): * Raw water pH *Raw water turbidity --> 24/11/20: RW not a priority at this stage *Filtered water turbidity (included in dot point above) *Treated chlorine residual (included in dot point above) *Online interlocks for pH and turbidity (NTU) on outlet for filters (A54) --> 24/11/20: In place in MDN for NTU; BDN/CBN/MDN/BWY require pH probes; BDN requires newPLC; CBN/BWY can have interlocks in place for NTU by 31/12/21 *Consider online turbidity meter with interlocks at BWY, BDN --> removed 24/11/20 as double up from dot point above *Consider interlocks for meters at CBN and MDN (A169) --> removed 24/11/20 as double up from dot point above *CBN - Install a second turbidity meter on the outlet of filter 2 and reconfigure the existing turbidity meter to monitor filter 1.(A130) --> 24/11/20: complete *CBN - Install continuous online chlorine meter to ensure continual effective disinfection/control of chlorination CCP.(A126) --> 24/11/20: previously completed *CBN-Connect scales for chlorine gas cylinders to SCADA. (part A165) --> 24/11/20: previously completed A13 - BWY: * Perform regular resting of filter headloss immediately after a backwash --> 24/11/20: no DP measurement device currently installed			27 June 2019 Improvement Plan review meeting (Compilation of actions)	A4	27-Jun-19	Very high	Manager Warrumbungle Water	23-Mar-21	31-Jul-23	Interim (gas chlorine DDO)	In progress				Funding granted from Safe and Secure for scoping study of automation. Covers action 21 13/12/19: Consultant engaged and is coming on site next week 13/12/19: PLC are needed to install online analysers 28/2/20: Teleconference workshop in December 2019. A number of actions have been included under this action (A 54, 124, 126, 258, 258, 165) Coonabarabran - Dual turbidity meters to be installed and replacement of PLC. PLC has been ordered. H20 to install individual filter analyser (only currently on one filter) 24/4/20 Quote received from Hunter H20 for filter media replacement. Consultant has submitted. Have had meeting with Consultant on progress this week. Consultant to submit further information needed to progress. 27/4/20: received automation audit report, need to review (CW, AM) to finalise; future funding for next steps of concept design and installation/construction uncertain; PLC in CBN being installed, BWY ordered; BDN/BWY online chlorine analysers ordered; old online CBN NTU meter being moved to BDN; CBN filter control upgrade being done this week incl dual NTU meters; SCADA upgrade progressing; BDN PLC being looked at (included in clarifier/filter replacement) 24/11/20: Autmaton upgrade - draft report peer reviewed, awaiting DPIE comments, BP report to Council scheduled for Feb 2021; online monitoring implemented for NTU and chlorine at CBN (no external alarms until SCADA upgrade complete) and MDN (has external alarms), for chlorine at BWY and BDN by 4/12/20 (no external alarms until SCADA upgrade complete), for BDN & BWY NTU by 31/12/21 (no external alarms until SCADA upgrade complete), for retic chlorine at CLH and DDO (external alarms), DDO disinfection chlorination by 31/12/20 (no external alarms until SCADA upgrade complete), CLH new chlorine room expected by 31/12/21 (will enable online monitoring of disinfection CCP), chlorine and pH in BUG and KBI - interlocks are in place for BUG/KBI (shut down bore pump, external alarm once reservoir level low), can be put in place in BWY, CBN and MDN now with new PLCs (wiring required); pH online monitoring can be done for filtered water at BDN, BWY, DDO, CBN and MDN (need to buy & install additional probes that hook to the combined chlorine analyser); RW pH/NTU only measured online in MDN - currently not affordable for any other sites/not a CCP therefore lower priority, however DPIE advised that further funding based on risk prioritisation is likely to become available 23/3/21: BDN and BWY have online chlorine meters now + new PLC at BWY (SCADA upgrade required for external alarms; SDACA tender recommendation going to Council in April 2021); online NTU meters on order for BDN & BWY, to be installed by 30/4/21; gas chlorination for DDO by 31/3/21 28/11/22 - All actions related to BWY, BDN, MDN have been included in the scope of the proposed upgrades to each WTP under the proposed funding deeds with DPE.	Review audit report from consultant	
330	BWY	Sedimentation	Major works Lagoons	Investigate restoring bank integrity of sedimentation lagoons (e.g. re-lining lagoons)			30 July 2019 Improvement Plan review meeting	A6	27-Jun-19	High	Supervisor Treatment	03-Aug-21	31-Jul-23		Complete				Requested advice from HunterH20 27/9/19: asked CWT for advice, who provided advice - next stage: ? (contractor to give price for realigning) 28/2/20: Further investigation needed 24/7/20: Capital item in FY 2021 (re-lining WTP lagoon - scoping) 25/3/21: lagoon assessment undertaken by contractor; \$30k budgeted in FY21/22 to undertake works 3/8/21: waiting for lagoon to dry out 28/11/22 - awaiting on lagoon to dry out over the summer period to schedule works.	Review previous advice and consider options	
334	All	DWMS		Review and update DWMS *Develop, document and implement a process for reviewing formal requirements every 12 months or where there are any changes to Council's activities or formal requirements (A4) * Formally document and communicate roles and responsibilities of staff relating to management of drinking water quality. (A6) * Develop a regular review process to update the list of stakeholders. Ensure contact details are current and all relevant parties are involved in engagement processes (A7) *Develop appropriate mechanisms for stakeholder commitment and involvement. Document the planned approach including partnership agreements or Memorandum of Understanding (MoU). (A9) * Ensure all operational procedures are documented and referenced in the DWMS document register (A117) * As part of Council's review of the DWMS risk assessment, review and discuss the effectiveness of existing processes and procedures in managing water quality. The review should draw on external research and information, the risk assessment, water quality analysis and organisational experience. With any changes in conditions, processes and procedures should be revalidated. (A260) * Describe process for document control for all DWMS documentation (i.e. ensure the currency, accessibility and appropriate review DWMS documents) (A267) * Update details for existing documentation in the DWMS document register. (A269) * Develop internal audit procedures and schedules appropriate to functionality of council and the water supply systems.(A277) * Develop and implement a process (including a schedule) for senior executive review of the effectiveness of the management system. The review process should include aspects such as: reports from audits, water quality performance, previous reviews, concerns from consumers and regulators and impacts of changes to internal or external conditions (e.g. regulatory, technology, organisational activities).(A285) * Review and update contact details listed in Table 10.(A334)			27 June 2019 Improvement Plan review meeting (Compilation of actions)	A10	27-Jun-19	High	Manager Warrumbungle Water	03-Aug-21	31-Jul-23		In progress				External project 13/12/19: Consultant has provided proposal to review and update DWMS 28/2/20: To update follow the risk assessment review (A20) No longer reporting monthly to General Manager. Annual update to Council (DWMS annual review report and improvement plan tabled). Review schedule to be formalised in DWMS update. 24/7/20: as per comment 28/2/20 24/11/20: Monthly reporting to GM resumed; still waiting on HH20 to commence Health funded risk assessment review 25/3/21: engaged ATOM to undertake DWMS update, had inception meeting, site visits scheduled for 19 + 20/04/21 3/8/21: received DWMS Update draft 28/11/22 - DWMS update received from ATOM Consulting		
336	All			Develop a process to regularly monitor and test safety showers and eye washes, include developing a register			27 June 2019 Improvement Plan review meeting	A12	27-Jun-19	High	Supervisor Treatment, Technical Officer	03-Aug-21	31-Jul-23		In progress				27/09/19: SS prepared draft checklist (16/08/19); locations need to be added; created carbon copy book/record documentation for each site (1xDDO sewer, 1xDDO water; 1xCLH water, 1xCLH sewer; 1xMDN water; 1xBWY water; 1xCBN sewer, 1xCBN water; 1xBDN water, 1xBDN sewer?) - check with supervisors what is practical 13/12/19: SS to add remaining locations and check with Supervisors 28/2/20: Register still being finalised. Supervisors to review once finalised. 24/11/20: Technical Officer position vacant since July 2020, hence no progress, however item is listed on site maintenance whiteboards 3/8/21: Tech officer to develop carbon copy books for weekly checks in liaison with Supervisor	Tech Officer to add remaining locations and check with Supervisors	Consultant
339	All			Develop system wide SOPs * Formally document any procedure related to existing control measures identified in the risk assessment that are not currently documented. Involve relevant staff in the development of these procedures. (A85 & 103) * Compile all SOPs into an operations manual (A86) Develop SOPs for: * Laboratory water quality sampling and testing (A131) * Scheduled maintenance tasks (A131) * Daily rounds (A131) * Plant operations (A131)batching and dosing (A104) * filter maintenance (A105) * distribution failures such as main breaks, sufficient flushing, cleaning of tools (A108) notification procedure for mains breaks (A109), closing household property meters prior to recommissioning mains (A110) * Monitor the sedimentation ponds daily for contamination sources such as dead animals(A216) * Consider sampling and testing program following mains repairs -SOP to be developed for pipe break repairs (and include monitoring) (A99) DWMS documentation: * Ensure all operational procedures are documented and referenced in the DWMS document register (A117)			30 July 2019 Improvement Plan review meeting	A15	30-Jul-19	High	Supervisors	03-Aug-21	31-Jul-23		In progress				Refer to related actions 85, 86,103,104, 105, 107, 108, 109, 110, 131, 103, 216 27/9/19 & 13/12/19: supervisors to identify which other SOPs are required once we receive the ones from HH20 - then get quote from them to develop those/the rest 28/2/20 - Staff meeting scheduled for 9 March 20. Supervisors still to identify SOPs required 24/11/20: AM to request quote from CWT for development of (selected/prioritised) outstanding procedures 25/3/21: this item has now also become part of WW Action Plan (employee engagement survey) 3/8/21: Supervisor/s to follow up with consultant (Peter Mosse)	Compile existing SWMS SOPs Develop list of required SOPs (including those to be developed by Hunter H20). Include priorities and timeframes to be developed. Staff meeting to be used to discuss required SOPs/SWMS	
340	All	Documentation / Protocol		That WSC investigate and implement a formalised preventative maintenance program for all the WTP, reticulation and reservoir assets. Including maintenance schedules (Action 168 and 172) *Identify critical equipment and develop procedures to maintain, repair and replace equipment as necessary (A190)	4.4	Equipment Capability and Maintenance	30 July 2019 Improvement Plan review meeting (compilation of actions)	A16	Jul-2019	Medium	Supervisors	03-Aug-21	TBD		In progress				Operation and maintenance schedules to be prepared by HunterH20 as part of NSW Health DWMS project. 13/12/19: Confirmed that maintenance schedules for WTP are to be undertaken as part of Hunter H20 NSW Health project. Will follow fluoridation project. 3/8/21: received O&M schedules for WTPs from HH20 in June 2020; formalised program outstanding as well as schedules for retic and reservoirs (reservoir items covered in weekly checklists - A 343) A190: 30/7/21: Critical spares list developed (on paper), needs to be recorded digitally/formalised within DWMS --> record under Asset Mgt and update when equipment is being serviced (sewer pumps)		Consultant

No	Location	Process step	Category	Action	ADWG No. ADWG Element	Source	Haz ID / Source number	Date added	Priority	Action Owner	Date reviewed	Due date (revised)	Due date notes	Status	Comments	Comments 29/08/18	Comments 1/3/19	Comments 27/6/19 & 30/7/2019 & 27/8/2019; 27/09/2019; 13/12/19; 28/2/20; 24/04/2020; 24/7/20; 24/11/20	Short term actions	Resource requirements	
341	All	All	Documentation / Protocol	Develop an Emergency Response Plan (ERP)/Incident Response Plans (IRPs), including: *Review and finalise ERP in DWMS Implementation Report (2016)(A232) * Establish a rapid communication system to deal with unexpected events (A138 & 223) * Train relevant staff in these procedures (rapid communication incident response) and maintain a record of training. (A139) *Define communication protocols with the involvement of relevant agencies and include in the protocols a contact list of relevant agencies and businesses and their relevant key people.(A225) * Identify an appropriate person to handle all incident and emergency communications and ensure they are appropriately trained (A228) * Develop a process for documenting and reporting of an incident or emergency.(A235) *Employees should be trained and protocols regularly tested in the emergency response plans. The requirement for this should be included in the ERP.(A236) *Develop a process for investigation following incidents and emergencies and document this process. Include in this process a mechanism for revision of any emergency protocols, where an investigation demonstrates it is required.(A234) * Identify possible water quality related incidents and emergency scenarios (the risk assessment should be used as a basis) and document these potential scenarios in an Incident and Emergency Response Plan. Document procedures and response plans to address these incidents (can refer to guideline protocols from NSW Health as provided in the DWMS). Add to the ERP particular processes that are required to address severe hazard / emergency scenarios, such as algal blooms, fuel spills, bushfire etc. The development of these protocols should involve relevant agencies.(A233) *Reference dialysis process in ERP (A229/224) *Undertake an exercise of the incident response plan with PHU following finalisation of ERP (A232)		Febray and July 2020 review meeting (compiled action)			Feb-2020	High	Manager Warrumbungle Water	03-Aug-21	31-Jul-23		In progress				28/2/20: Confirmed that development of ERP is to be undertaken as part of Hunter H20 NSW Health project. Actions 8, 138, 139, 223, 225, 228, 232, 233, 234, 235 closed and are now covered under this action. Progress delayed (prioritised filter inspection) 24/7/20: added actions 139, 236 and 342 to this item; Also refer to Action 224/229 (dialysis list/notification procedure; low priority) 3/8/21: IRPs developed in draft by HH20 in Oct-2020; mock events scheduled for 24/25 August 2021		
343	All			Development of document to undertake regular reservoir inspections: * Consider a routine reservoir inspection (checking locks etc.), A106 *develop reservoir SOP (specific to individual reservoir requirements) (A334 & 107) *develop reservoir inspection checklists for the operators (A310) *Train operators in reservoir inspections (A310) *Develop regular (weekly/monthly/annual) reservoir integrity inspection and reporting program (A273) * Assess compliance regarding reservoir access with Australian Standards and common sense (A84)		Febray 2020 review meeting (compiled action)			28-Feb-20	High	Supervisor Treatment	03-Aug-21	31-Jul-23		In progress				28/2/20: New action created to compile a number of related actions (A334, 107, 310, 273, 84) Visuals inspections are currently recorded in diaries. Engaging contractor (WEARS) to develop reservoir integrity checklist to undertake inspections. Including assessing WHS issues that are limiting inspections currently. 24/7/20: WEARS to redevelop (got lost) 24/11/20: reminded WEARS 3/8/21: checklists still outstanding from WEARS	Follow up with WEARS	