



Hunter Water 2021 operational audit

Report to the Minister

March 2022

Water >>



Tribunal Members

The Tribunal members for this review are:

Carmel Donnelly, Chair
Deborah Cope
Sandra Gamble

Enquiries regarding this document should be directed to a staff member:

Christine Allen (02) 9290 8412
Mamata Titus (02) 9113 7750
Gudny Palsdottir (02) 9113 7709

The Independent Pricing and Regulatory Tribunal (IPART)

Further information on IPART can be obtained from [IPART's website](#).

Acknowledgment of Country

IPART acknowledges the Traditional Custodians of the lands where we work and live. We pay respect to Elders, past, present and emerging.

We recognise the unique cultural and spiritual relationship and celebrate the contributions of First Nations peoples.

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Summary

Customers in NSW rely on safe and reliable water and wastewater services. Operating licences outline obligations imposed by the NSW Government on publicly owned monopoly suppliers of essential services such as Hunter Water Corporation (Hunter Water). We undertake annual operational audits to ensure Hunter Water meets the requirements under its operating licence.

This is our report to the Minister for Lands and Water (Minister) on the 2021 operational audit as required under the *Hunter Water Act 1991* (Act). In 2021, Hunter Water was audited for its compliance with 29 clauses of the *Hunter Water 2017-2022 Operating Licence* (Licence).^a We engaged a specialist auditing firm, Cardno Pty Ltd (Cardno), to audit 18 Licence clauses and we (IPART) checked the other 11 clauses.

Key findings

Hunter Water demonstrated a high level of compliance with the Licence clauses during the 2020-21 audit period,^b tested during the 2021 operational audit. Hunter Water was forthcoming and cooperative throughout the audit process demonstrating a strong culture and commitment to compliance.

Hunter Water was fully compliant with 20 of the 29 audited Licence clauses. We only found non-compliances (non-material) with 2 Licence clauses. Hunter Water was largely compliant with another 5 clauses but we found minor shortcomings. The final 2 clauses were not triggered in the audit period.

- During 2020-21, Hunter Water was non-compliant (non-material) with 2 clauses because it:
 - did not include information on actions for non-payment within its pamphlets provided to customers, as required by Licence clause 5.7.1(b),
 - did not notify IPART of a proposed new Critical Control Point (CCP) as required under Hunter Water's Reporting Manual,¹ and Licence clause 6.2.1 which enforces the reporting requirements,
 - did not publish its monthly water quality summary by the time required under the Reporting Manual, and Licence clause 6.2.1 which enforces the reporting requirements, and
 - had incorrect explanatory text in its reporting processes, which is not a deficiency in its own right, but contributed to the deficiencies with the Reporting Manual noted above.

^a Our report presents an exception-based summary of the audit. We discuss any audited clause which did not receive a "Compliant" grading in Chapter 2. For the full findings of the audit refer to the auditor's report in Appendix E.

^b The 2021 operational audit period for Hunter Water was from 1 November 2020 to 31 October 2021.

- During 2020-21, Hunter Water was compliant (minor shortcomings) with 5 clauses.
 - Four of these clauses related to water quality management, because Hunter Water's drinking and recycled water quality management systems were not fully consistent with the Australian Drinking Water Guidelines and Australian Guidelines for Water Recycling, as required by Licence clauses 3.1.1 and 3.2.1. There were also some shortcomings with how Hunter Water implemented these water quality management systems, as required by Licence clauses 3.1.2 and 3.2.2. These minor shortcomings did not impact on the quality of water produced by Hunter Water during the audit period which continues to be of a high standard that meets public health requirements.
 - The other clause related to the maintenance of Hunter Water's Quality Management System (QMS). Hunter Water's document management system was producing systemic version control failures. Hunter Water is already taking measures to address these failures.

The auditor made 22 recommendations to address the deficiencies and shortcomings identified.^c We have discussed the audit findings and recommendations in Chapter 2.

Previous audit findings

This audit also followed up Hunter Water's progress in addressing 7 outstanding recommendations related to non-compliances or shortcomings identified in previous audits. These recommendations related to pricing and water quality management requirements in the Licence.^d

Hunter Water has completed 5 of these 7 recommendations and is progressing the remaining 2 recommendations. Hunter Water has now addressed the non-compliance with the pricing clause but as noted above, there remain some minor shortcomings with the water quality management clauses. We discuss these shortcomings further in Chapter 2.

Our discussion of Hunter Water's progress with previous recommendations, including the 2 ongoing recommendations, is presented in Chapter 3.

^c Auditors are only required to make recommendations for grades other than Compliant grades – i.e. for Compliant (minor shortcomings), Non-compliant (non-material) and Non-compliant (material) grades. This is consistent with our audit guideline for public water utilities (IPART, *Audit Guideline – Public Water Utilities*, July 2019).

^d That is, clauses 1.8.1, 3.1.2, 3.2.1 and 3.2.2 of the Licence.

1 Introduction

We engaged specialist auditing firm, Cardno (now part of Stantec Pty Ltd) in partnership with Risk Edge and Atom Consulting, to undertake the audit on our behalf (noting that we checked Hunter Water's compliance with 11 Licence clauses and these were not part of the auditor's scope).

This report summarises the audit findings for the Minister.² The compliance grades used in this report are explained in Appendix A.

1.1 Annual statement of compliance

In preparing this report we have also considered Hunter Water's annual Statement of Compliance (Appendix B). The Statement of Compliance is an exception-based report^e certified by Hunter Water's Managing Director and the Chair of the Board of Directors of Hunter Water. It explains what remedial action Hunter Water has taken, or is taking, to resolve outstanding non-compliances.

This year Hunter Water reported one non-compliance with its reporting requirements that we confirmed at the operational audit Clause 6.2.1 of the Licence enforces the requirements of the Reporting Manual.

In December 2020, Hunter Water began operating the upgraded Wastewater Treatment Plant at Dungog (Dungog WWTP). Hunter Water proposed changing a CCP for Dungog WWTP's recycled water production in light of the upgrades to the treatment plant. Changes to CCPs are considered 'significant' changes to water quality management systems. Under section 3.2.2 of the Reporting Manual, Hunter Water must notify NSW Health and us (IPART) of proposed significant changes to its drinking or recycled water quality management systems. Hunter Water notified NSW Health of the proposed change to the CCP, but it failed to notify us (IPART).

We have made a recommendation to address this non-compliance so that in future we are notified of proposed significant changes at the same time as NSW Health. However, we note that this deficiency is not material because the proposed change has not yet been implemented. Therefore, the consequences are minor. The proposed change is currently under review by NSW Health. As the state health regulator, we consider that it is more critical that NSW Health was notified at the required time than IPART.

We discuss this non-compliance, and our recommendation to address it, further in Chapter 2.

We commend Hunter Water for proactively reporting this non-compliance. This helps us undertake our compliance monitoring function and demonstrates a culture of compliance at Hunter Water.

^e That is, Hunter Water is only required to report on clauses where it considers it is non-compliant.

1.2 Audit scope

The 2021 audit covered the period from 1 November 2020 to 31 October 2021. Appendix C describes the audit process and Appendix D includes the detailed audit scope.

2 Audit findings and recommendations

This chapter sets out the auditor's findings relating to non-compliances and minor shortcomings.


Where we found Hunter Water non-compliant with a clause, we have made a recommendation as to how to address the non-compliance. The auditor also identified some opportunities for improvement in Hunter Water's operational audit report, provided in Appendix E.

Our assessment of the Licence clauses that we checked is in Appendix F.

The Reporting Manual³ requires Hunter Water to report on its progress in implementing these recommendations by 31 March each year. We may agree to receiving the progress report later than the date in the Reporting Manual. We have agreed to a later date of 30 June for this year.

The 2021 audit is the 4th operational audit of Hunter Water's compliance with the requirements of the current Licence. Table 1 provides a comparison of non-compliant and minor shortcomings audit findings across the audit years during the 2017-2022 Licence term. Table 1 does not include Licence clauses where Hunter Water has been fully compliant when audited during the Licence term.

Table 1 Comparative record of non-compliant findings and identified shortcomings for the 2017-2022 Licence

Licence clause	Requirement	Compliance grade				
		2017-18 ^a	2018-19 ^b	2019-20 ^c	2020-21	2021-22
1.8.1	Pricing					-
3.1.1	Maintain a Water Quality Management System for drinking water					-
3.1.2	Implement the Water Quality Management System for drinking water					-
3.2.1	Maintain a Water Quality Management System for recycled water					-
3.2.2	Implement the Water Quality Management System for recycled water					-
4.2.2	Implement the Environmental Management System		-	-		-
4.3.1	Maintain a Quality Management System	-	-	-		-
5.7.1	Prepare pamphlets for customers communicating the information specified in clause 5.7.1	-	-	-		-
5.7.2	Make copies of the documents required by clause 5.7.2 available	-				-
5.1.1	Use best endeavours to enter into, and comply with, a memorandum of understanding with Fire and Rescue NSW			-	-	-

Licence clause	Requirement	Compliance grade				
		2017-18 ^a	2018-19 ^b	2019-20 ^c	2020-21	2021-22
6.2.1	Comply with the reporting requirements set out in the Reporting Manual	-		-		-

Sources:

IPART, *Hunter Water Operational Audit 2018 – Report to the Minister – Compliance Report*, March 2019.

IPART, *Hunter Water Operational Audit 2019 – Report to the Minister – Compliance Report*, March 2020.

IPART, *Hunter Water Operational Audit 2020 – Report to the Minister – Compliance Report*, March 2021

Cardno, *HWC Operational Audit Report, HWC IPART Audit*, March 2022.

Note: This table does not include clauses of the Licence where Hunter Water has been fully compliant.



Note: The 2017-18 audit period is 1 July 2017 to 30 June 2018. The 2018-19 audit period is 1 July 2018 to 30 August 2019. The 2019-20 audit period is 31 August 2019 to 31 August 2020. The 2020-21 audit period is 1 November 2020 to 31 October 2021.

Note:  = Compliant;  = Compliant (minor shortcomings);  = Non-Compliant (non-material);  = Non-Compliant (material).

2.1 Audit findings and recommendations summary


Table 2 provides details of non-compliances and minor shortcomings identified in the audit as well as our recommendations to address them.


Table 2 2021 compliance with Hunter Water's operating licence – grades other than fully compliant


Licence clause	Requirement	Compliance grade	Audit finding	Recommendations
3.1.1	Hunter Water must maintain a Water Quality Management System for drinking water	 Compliant (minor shortcomings)	<p>We have assigned Hunter Water a Compliant (minor shortcomings) grade for clause 3.1.1. This agrees with the auditor's finding.</p> <p>Hunter Water has demonstrated that it maintained a Drinking Water Quality Management System consistent with the Australian Drinking Water Guidelines (ADWG), as required by the Licence, during the audit period.</p> <p>We observed minor shortcomings in the following areas that Hunter Water should resolve for full compliance with the Licence:</p> <ul style="list-style-type: none"> Hunter Water had agreements with MidCoast Council and Central Coast Council, but the sighted agreements were old (19 years and 15 years respectively). The auditor observed shortcomings in accuracy for water quality specifications and out of date references. Although the water supply agreements do not reflect current status, in practice, operational monitoring is being undertaken and therefore, the shortcoming is considered minor. There is a slight disconnect over what incident levels (minor, moderate, major, and crisis-emergency) require an investigation and root cause analysis to be undertaken. Only major and crisis-emergency level incidents had explicit requirements for debriefs and action recording. The ADWG Framework requires any incidents or emergencies to be investigated and protocols revised if necessary. Hunter Water developed a health complaints guideline and demonstrated that NSW Health had input into the guideline, but it was unclear if NSW Health was involved in the finalisation of the guideline. The ADWG requires the involvement of relevant agencies in defining potential incidents. Hunter Water maintained a document for establishing and reviewing CCPs but there were minor shortcomings with Hunter Water's documentation of the evidence base for setting CCP limits. <p>We consider these issues to be minor shortcomings because they did not impact on Hunter Water's ability to assure controlled processes to manage the risk to drinking water quality supplied to its customers during the audit period.</p>	<p>2021-1: By 31 March 2023, Hunter Water must undertake a review and revise both the MidCoast Council and the Central Coast Council water supply agreements, with particular attention to quality, quantity, maintenance, operations and ownership aspects.</p> <p>2021-2: At the next Corporate Incident and Emergency Management Plan review, Hunter Water must review incident level categories and make clear which ones require a root cause analysis / incident investigation.</p> <p>2021-3: By 30 June 2022, Hunter Water must communicate finalisation of its health complaints guideline to NSW Health.</p> <p>2021-4: By 1 November 2022, Hunter Water must improve documentation of the evidence base for Critical Control Point (CCP) limits (e.g. through annotations in the CCP limits table).</p>
3.1.2	Hunter Water must implement its Water Quality Management System for drinking water	 Compliant (minor shortcomings)	<p>We have assigned Hunter Water a Compliant (minor shortcomings) grade for clause 3.1.2. This agrees with the auditor's finding.</p> <p>Hunter Water implemented its Drinking Water Quality Management System during the audit period with minor shortcomings in the following areas:</p>	



Licence clause	Requirement	Compliance grade	Audit finding	Recommendations
			<ul style="list-style-type: none"> Hunter Water implemented a process for identifying and communicating regulatory and formal requirements during the audit period. There was a minor shortcoming with documenting the process of changes between versions 3.5 and 3.6 of the ADWG. Although the changes were updated, the register still cited the older version (3.5). There were also other minor shortcomings such as with currency of documentation (but the critical documents sighted were current). We have not made a recommendation to address these here as these shortcomings will be addressed by completing recommendation 2021-19. Hunter Water had not included MidCoast Council and Central Coast Council in the Key Emergency Services and Stakeholder Contact List, though these were identified as key stakeholders and their details provided elsewhere in the Drinking Water Quality Management System. Therefore, this is a minor shortcoming. The auditor found that the risk registers for Gresford water treatment plant did not include risk treatments for all risks rated medium or higher, though this is required by Hunter Water's procedure. However, this is a shortcoming because all of the required improvement actions had been identified and documented in a summary paper, but the risk register was yet to be updated. Hunter Water's CCP limit tables for the Lemon Tree Passage water treatment process had minor typographical errors and did not always match the limits in SCADA^f. However, the CCP limits in SCADA were more conservative than those in the CCP limit tables. As there is no material impact on Hunter Water's operations, this discrepancy is considered a minor shortcoming. The auditor could not confirm that the CCP limit table for the network chlorinators was within its review cycle. It only included its issue date but did not specify its review cycle, as other CCP limit tables did. The auditor confirmed that it was current because the CCPs are reviewed in the risk assessments or by exception. The CCP limit table for the network chlorinators should include the review cycle. The auditor found records of calibration to support critical operations having occurred in practice but there were minor shortcomings with completing checklists on 2 occasions. 	<p>2021-5: By 30 June 2022, Hunter Water must include MidCoast Council and Central Coast Council in the Key Emergency Services and Stakeholder Contact List of the Corporate Emergency Plan.</p> <p>2021-6: At the next risk review, Hunter Water must ensure that the risk assessments capture a corresponding risk treatment for medium controlled risks and above, within the risk register itself.</p> <p>2021-7: By 1 November 2022, Hunter Water must review the CCP Limit Tables and ensure that the limits and the logic are accurate and match SCADA.</p> <p>2021-8: By 1 November 2022, Hunter Water must update the network chlorinators CCP information to include the currency information, according to the stated process.</p> <p>2021-9: By 30 June 2022, Hunter Water must ensure that operators are trained to complete all components of the site checklists.</p>

^f Supervisory Control and Data Acquisition (SCADA)

Licence clause	Requirement	Compliance grade	Audit finding	Recommendations
			<ul style="list-style-type: none"> Finally, Hunter Water identified missing samples of completed water quality verification analysis compared to what was scheduled in its monitoring plan. Hunter Water has already identified measures to prevent recurrence and improve the sampling compliance review process. <p>We consider these issues to be minor shortcomings because they did not impact on Hunter Water's ability to assure controlled processes to manage the risk to drinking water quality supplied to its customers during the audit period.</p>	<p>2021-10: By 30 September 2022, Hunter Water must strengthen existing reporting lines to the water quality committee to include comparison of the network verification sampling that has been completed with what was scheduled.</p>
3.2.1	Hunter Water must maintain a Water Quality Management System for recycled water	 Compliant (minor shortcomings)	<p>We have assigned Hunter Water a Compliant (minor shortcomings) grade for clause 3.2.1. This agrees with the auditor's finding.</p> <p>Hunter Water demonstrated that it maintained a Recycled Water Quality Management System consistent with the Australian Guidelines for Water Recycling (AGWR), as required by the Licence, during the audit period.</p> <p>We observed minor shortcomings in the following areas that Hunter Water should resolve for full compliance with the Licence:</p> <ul style="list-style-type: none"> Table 2.1 of the RWQMP Corporate Recycled Water Quality Management Plan includes the details required by the AGWR framework for Hunter Water's recycled water schemes. However, we observed a minor shortcoming at the audit. Hunter Water had not listed residential use as an intended use for the recycled water that was supplied from the Morpeth and Farley Wastewater Treatment Works to dual reticulation schemes during the audit period. Other documents showed that residential use was intended for these schemes Hunter Water produces an annual report on water recycling to the relevant stakeholders, including the end users of recycled water, as required by the AGWR framework. However, Hunter Water did not have an established process for producing this report in the corporate Recycled Water Quality Management Plan or in the recycled water customer agreements sampled during the audit. As the report can be produced (on request by stakeholders), we consider this a minor shortcoming. Hunter Water demonstrated that it had established a process for internal and external auditing (including documenting and communicating the audit results) as required by the AGWR framework. However, we observed a minor shortcoming. Hunter Water's Corporate Recycled Water Quality Management Plan did not describe how the scope of internal audits is determined and how the audit recommendations are to be actioned and tracked. 	<p>2021-11: By 31 March 2022, Hunter Water must update Table 2.1 of the Corporate Recycled Water Quality Management Plan to include residential use as an intended use for recycled water from the Morpeth and Farley Wastewater Treatment Works.</p> <p>2021-12: By 30 June 2022, Hunter Water must document the process for providing annual reports on recycled water to end users and clearly communicate this process with each end user.</p> <p>2021-13: By 31 March 2022, Hunter Water must update the Corporate Recycled Water Quality Management Plan to reflect changes to the process for scheduling internal audits of Recycled Water Quality Management Plans, including how the scope of the audits is determined and how the audit recommendations are actioned and tracked.</p>

Licence clause	Requirement	Compliance grade	Audit finding	Recommendations
3.2.2	Hunter Water must implement its Water Quality Management System for recycled water	 Compliant (minor shortcomings)	<p>We consider these issues to be minor shortcomings because they did not impact on Hunter Water's ability to assure controlled processes to manage the risk to recycled water quality supplied to its customers during the audit period.</p> <p>We have assigned Hunter Water a Compliant (minor shortcomings) grade for clause 3.2.2. This agrees with the auditor's finding.</p> <p>Hunter Water implemented its RWQMS in the audit period with minor shortcomings in the following areas:</p> <ul style="list-style-type: none"> The auditor found that the customer agreements for Cessnock Golf Course, at Kurri Kurri TAFE and Kurri Kurri Golf Course were expired for part of the audit period. Hunter Water has already addressed this shortcoming by sending letters to the customers to extend the agreements. Further, despite the agreements expiring, Hunter Water continued to engage with each customer through information and formal communication, ensuring the customers obligations under the agreement were met. We have made a recommendation to reduce the risk of customer agreements being past their expiry date in future. Hunter Water demonstrated implementation of its Recycled Water Quality Management Plan for constructing a process flow diagram of the recycled water system from the source to application or receiving environments. The site visit to Kurri Kurri Water Treatment Works demonstrated that the process flow diagram generally depicts the process implemented. However, the auditor found shortcomings with some missing process steps on the process flow diagram. We have identified these as shortcomings as they did not impact on the process and recycled water outcomes during the audit period. Hunter Water demonstrated implementation of its Recycled Water Quality Management Plan for ensuring only approved materials and chemicals are used and establishing documented procedures for evaluating chemicals, materials and suppliers. This was tested at Kurri Kurri Wastewater Treatment Works. However, the auditor observed one minor shortcoming. The work instruction for receipt of deliveries of aluminium sulphate required testing of a sample prior to unloading however this was not being implemented. However, this is a minor shortcoming because these tests are to check for the strength of the aluminium sulphate solution. Variations to the strength would not affect the health requirements for recycled water. There are also operational controls to adjust for variations in aluminium sulphate dosing. 	<p>2021-14: By 31 March 2022, Hunter Water must ensure that all recycled water customer agreements are not past their expiry date and it must develop procedures to ensure the agreements are extended or renewed before the expiry date.</p> <p>2021-15: By 31 March 2022, Hunter Water must update the process flow diagram for Kurri Kurri Wastewater Treatment Works to accurately reflect the current number of clarifiers and chemical dosing.</p> <p>2021-16: By 31 March 2022 Hunter Water must review, together with Veolia, the need for testing of every delivery of aluminium sulphate at wastewater treatment works and update the work instruction for delivery and testing to reflect the outcome of this review.</p>

Licence clause	Requirement	Compliance grade	Audit finding	Recommendations
			<ul style="list-style-type: none"> Hunter Water demonstrated implementation of its Recycled Water Quality Management Plan for validating processes to ensure they control hazards effectively and revalidate processes when variations in conditions occur. The auditor found one minor shortcoming in that Hunter Water's documents did not provide a basis for the 4 log reduction in helminths claimed from the membrane bioreactor at Dungog Wastewater Treatment Works. Further, the log reductions for the Dungog Wastewater Treatment Works have not been incorporated into the Validation Testing Program for Water Recycling Schemes. However, these shortcomings are minor because helminth infections are generally not endemic in Australia. Hunter Water demonstrated implementation of its Recycled Water Quality Management Plan for collecting and evaluating long-term data to assess performance, identify problems, and report results. The auditor found a discrepancy in a Disinfected Effluent UV Transmittance (UVT) limit and the CCP limit in the Kurri Kurri Recycled Water quality trend spreadsheet used to present long term trends. However, this discrepancy is a minor shortcoming because the UVT did not drop below 50% during the audit period, which is above the CCP limit of 45%. 	<p>2021-17: By 30 June 2022, Hunter Water must include the basis for the 4 log reduction in helminths in the membrane bioreactor at Dungog Wastewater Treatment Works. Hunter Water must update the Validation Testing Program for Water Recycling Schemes to include the log reductions for the upgraded Dungog Wastewater Treatment Works. Hunter Water must also develop a process to ensure changes to log reduction values are reviewed and incorporated into the Validation Testing Program for Water Recycling Schemes.</p> <p>2021-18: We recommend by 31 March 2022 that Hunter Water updates the Disinfected Effluent UVT limit to reflect the CCP limit in the spreadsheet used to present long term trends of Kurri Kurri recycled water quality and check all other recycled water trend spreadsheets for discrepancies in the limits.</p>
4.3.1	Hunter Water must maintain a Quality Management System	 Compliant (minor shortcomings)	<p>We consider these issues to be minor shortcomings because they did not impact on Hunter Water's ability to assure controlled processes to manage the risk to recycled water quality supplied to its customers during the audit period.</p> <p>We have assigned Hunter Water a Compliant (minor shortcomings) grade for clause 4.3.1. This agrees with the auditor's finding.</p> <p>Hunter Water demonstrated that it maintained a Quality Management System (QMS) consistent with AS/NZS ISO 9001:2016 Quality management systems – Requirements, during the audit period, as required by the Licence.</p>	<p>2021-19: By 31 October 2022, Hunter Water should develop a plan for, and report on, its progress with implementing the proposed opportunities for improvement for its Integrated Management System document control).</p>
			<p>We observed one minor shortcoming. Hunter Water found that the system it had in place was producing systemic version control failures, which is a non-conformance with clause 7.5 of AS/NZS 9001 which requires 'control of documented information'. During the audit period, Hunter Water identified the document control risk, indicating that the QMS is working effectively, and self-initiated the non-conformance, demonstrating commitment. Accordingly, the risks related to this shortcoming are minimal. Hunter Water is already undertaking measures to address this matter.</p>	

Licence clause	Requirement	Compliance grade	Audit finding	Recommendations
5.7.1	Prepare pamphlets for customers communicating the information specified in clause 5.7.1	 Non-Compliant (Non-Material)	<p>The shortcoming did not impact on Hunter Water's ability to assure controlled processes and manage the risk to quality management. We have assigned Hunter Water a Non-Compliant (Non-Material) grade for clause 5.7.1. This agrees with the auditor's finding.</p> <p>Hunter Water prepared pamphlets that met the majority of the requirements of this clause except for the requirements of Licence clause 5.7.1(b). That is, the pamphlets did not contain information on actions for non-payment. However, we consider that the non-compliance is non-material. While the information on actions for non-payment is not in the pamphlet as required by the Licence, it is available on Hunter Water's website. Hunter Water's customers are able to access it, and this meets the intention of the clause. We have assigned Hunter Water a Non-Compliant (Non-Material) grade for clause 6.2.1. This agrees with the auditor's finding.</p>	<p>2021-20: By 30 September 2022, Hunter Water should include a brief explanation of actions for non-payment in a pamphlet that is distributed with bills at least annually.</p>
6.2.1	Hunter Water must comply with all of its reporting requirements set out in the Reporting Manual	 Non-Compliant (Non-Material)	<p>Hunter Water failed to comply with its reporting requirements in the following areas over the audit period:</p> <ul style="list-style-type: none"> Hunter Water self-reported that it did not notify IPART of a proposed new CCP at Dungog WWTP at the time that NSW Health were notified of this proposal. Section 3.2.2 of the reporting manual requires that all proposed significant changes to the drinking or recycled water quality management systems must be reported to NSW Health and IPART. We agree with Hunter Water that changes to CCPs would be a 'significant' change that must be reported. We consider this to be a non-material deficiency because the proposed change has not yet been implemented, and therefore the related risks are minor, and at least NSW Health had been notified. Hunter Water did not publish its monthly water quality summary on time in August 2021. Section 3.1.1 of the Reporting Manual requires Hunter Water to prepare a monthly report that summarises the results of routine drinking water quality monitoring, and to publish that report by the 14th day of the following month. We consider this to be a non-material deficiency. Hunter Water had finalised the report in time but had failed to upload it onto its website due to an administrative error. It was uploaded on 25 August 2021. As this deficiency has already been resolved, we have not made any further recommendations. 	<p>2021-21: By 30 September 2022, Hunter Water should set up a process to ensure that IPART, as well as NSW Health, are advised of any proposed significant changes to the Drinking Water and Recycled Water Quality Systems.</p>

Licence clause	Requirement	Compliance grade	Audit finding	Recommendations
			<ul style="list-style-type: none"> There were a few sections of the Reporting and Monitoring Protocol where explanatory text incorrectly described the process. Provision of incorrect advice within such a document could result in Hunter Water not fully meeting its Reporting Manual requirements. This deficiency alone would not typically result in the grading of this clause as non-compliant. However, given the above 2 non-material deficiencies occurred during the audit period, we have also identified this issue as a deficiency to be resolved. 	2021-22: By 30 September 2022, Hunter Water should review and update the Corporate Standard – Reporting and Monitoring Protocol, following completion of the BOM review of NPR reporting in late February 2022.

Source: Cardno, *HWC Operational Audit Report*, March 2022

3 Progress on previous audit recommendations

The previous audits identified areas where Hunter Water did not achieve compliance with its Licence obligations. We made recommendations to address these issues.⁴

Hunter Water completed 5 of 7 outstanding audit recommendations in the audit period. Hunter Water is progressing the remaining 2 recommendations. Table 3 outlines Hunter Water's progress in implementing the recommended actions.

Table 3 Hunter Water's progress in 2021 to address our recommendations from the previous audits

	Recommendation	Progress
2019-06	Pricing (clause 1.8.1): By 31 March 2021, Hunter Water must ensure that the proposed functionality for fully automated tankered waste billing is incorporated into the new corporate billing system.	Complete We were advised at the audit interview that the Automated Trade Waste Billing System went live on the 28 October 2021.
2020-01	Drinking water (clause 3.1.2) By 30 June 2021, Hunter Water should ensure that minor drinking water quality incidents are all recorded as required by the Corporate Emergency Management Plan.	Complete Hunter water provided evidence to show that procedure HW2006-2906 4 6.023 had been updated, evidence to confirm that staff have been provided comprehensive training in incident reporting and other documentation supporting that reporting of water quality incidents to the water quality committee occurred.
2020-02	Recycled water (clause 3.2.1) By 31 October 2021, Hunter Water should ensure that the quality assurance and validation procedures for sampling are documented in its recycled water quality monitoring plan. The AGWR (Box 2.10) requires that quality assurance details are in a monitoring plan.	Ongoing Hunter Water's laboratory services provider, ALS, undertake the sampling for Hunter Water. ALS document references were to be included in the Recycled Water Quality Monitoring Plan. The audit found, however, the requirement for QA/QC on analysis is not included in the Corporate RWQMS.
2020-03	Recycled water (clause 3.2.2) By 31 October 2021, Hunter Water should review the manner in which recycled water quality issues are documented and reported so as to ensure that they are managed and closed out in a consistent manner.	Complete Hunter Water have developed a Potable and Recycled Water Incident Map which includes a list of recycled water quality events, the action required including reporting to NSW Health.
2020-04	Recycled water (clause 3.2.2) By 30 June 2021, Hunter Water should review the effectiveness of the Recycled Water Quality Management Plan at the Integrated Management System Review Meeting or at other appropriate senior management meetings.	Complete The Recycled Water Compliance function is now attending the Integrated Management System meetings and is working to integrate Recycled Water as part of Hunter Water's audits/assessments.
2020-05	Recycled water (clause 3.2.2) By 31 March 2021, Hunter Water should ensure that the Recycled Water Quality Management System Improvement Plan is monitored, and improvement tasks are actioned in line with the plan.	Complete Internal Recycled Water meetings have been established which includes new reporting tools to better inform on upcoming tasks. Hunter Water described how the RWQMS improvement plan spreadsheet is used to enter actions from risk assessments, audits and external stakeholders.
2013-14-03, 2013-14-04, 2013-14-06, 2013-14-13	Completion of this recommendation requires the addition of two items (one remains outstanding) to the Recycled Water Quality Improvement Plan to meet NSW Health's conditions for approval of the final Validation Plan (i.e. the Validation Testing Program for Water Recycling Schemes).	Ongoing Hunter Water is liaising with its service providers (Veolia and Water Futures) to close out these items. This recommendation is not complete and should remain open until NSW Health can comment on the information provided on UVT and the Validation Testing Program.






Sources: IPART, *Hunter Water Operational Audit 2020 – Report to the Minister – Compliance Report*, March 2021
Cardno, *HWC Operational Audit Report*, March 2022

Appendices



A Compliance grades

Table A.1 Current compliance grades

Compliance grade	Description
 Compliant	Sufficient evidence is available to confirm that the requirements have been met.
 Compliant (minor shortcomings)	Sufficient evidence is available to confirm that the requirements have been met apart from minor shortcomings which to date have not compromised the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.
 Non-compliant (non-material)	Sufficient evidence is not available to confirm that the requirements have been met and the deficiency does not adversely impact the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.
 Non-compliant (material)	Sufficient evidence is not available to confirm the requirements have been met and the deficiency does adversely impact the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.
 No Requirement	There is no requirement for the utility to meet this criterion within the audit period.

Source: IPART Audit Guideline Public Water Utilities, July 2019, Figure 2.1.

B Hunter Water's statement of compliance



Hunter Water Corporation
ABN 46 228 513 446

PO Box 5171
HRMC NSW 2310
36 Honeysuckle Drive
NEWCASTLE NSW 2300
1300 657 657 (T)
enquiries@hunterwater.com.au
hunterwater.com.au

31 August 2021

Our Ref: HW 2009-1194/17/1.002

The Chief Executive Officer
Independent Pricing and Regulatory Tribunal of NSW
Level 15, 2-24 Rawson Place
Sydney NSW 2000

compliance@ipart.nsw.gov.au

Dear Ms Livingstone

Statement of Compliance 2020-21

For 2020-21

Submitted by Hunter Water Corporation (Hunter Water)

Hunter Water reports as follows:

1. This statement documents compliance during 2020-21 with all obligations to which Hunter Water is subject by virtue of its Operating Licence.
2. This report was prepared by Hunter Water with all due care and skill, including to ensure that all information is true and correct, in full knowledge of conditions to which Hunter Water is subject under the *Hunter Water Act 1991* (NSW).
3. Schedule A provides information on all obligations with which Hunter Water did not comply during 2020-21.
4. Other than the information provided in Schedule A, Hunter Water has complied with all conditions to which it is subject.
5. This compliance report has been approved by the Managing Director and the Chair of the Board of Directors of Hunter Water.

Signed:

NAME: DARREN CLEARY
Title: **Managing Director**

Date: 31 August 2021

NAME: GREG MARTIN
Title: **Chair**

Date: 31 August 2021

Schedule A – Non-compliances identified during the reporting period

Table #	List of clauses breached, including a brief description of each licence clause	Describe:	
		I.	II.
1	<p>Operating Licence clause 6.2.1 c)</p> <p>6.2.1 Hunter Water must comply with all of its reporting obligations set out in the Reporting Manual, including in relation to:</p> <p>c) organisational systems managements;</p> <p>Hunter Water has not complied with the Reporting Manual Obligation:</p> <p>3.2.2 Notification of significant changes to Water Quality Management Systems</p> <p>Hunter Water must notify IPART and NSW Health of any significant changes that it proposes to make to the Drinking Water and Recycled Water Quality Management Systems.</p>	<p>I.</p> <p>II.</p> <p>III.</p> <p>IV.</p> <p>V.</p> <p>VI.</p>	<p>Date or period of non-compliance</p> <p>Nature and extent of non-compliance (including whether and how many customers have been affected)</p> <p>Results of any monitoring (where applicable)</p> <p>Reasons for non-compliance</p> <p>Remedial actions taken</p> <p>Actual/anticipated date of full compliance</p> <p>From 17 December 2020 to present.</p> <p>From 17 December 2020 Hunter Water began operating the new and upgraded Wastewater Treatment Plant at Dungog (Dungog WWTP). The plant is now a Membrane Biological Reactor (MBR) which produces very high quality effluent.</p> <p>Critical Control Points (CCP) are an important component of the Recycled Water Quality Management System. Since the upgrade, Hunter Water has applied a revised CCP for Dungog WWTP's recycled water production (relating to MBR permeate water turbidity).</p> <p>Hunter Water notified NSW Health of the proposed change to the Recycled Water Quality Management System in October 2020. Since that date, Hunter Water have been in consultation with NSW Health seeking to have the revised CCP endorsed. To date there has been no formal response on the endorsement of the revised CCP.</p> <p>Hunter Water was required to notify IPART of the revised CCP for Dungog WWTP, however this did not occur at the time, due to Hunter Water awaiting NSW Health endorsement of the revised CCP.</p> <p>N/A</p> <p>As noted in II above, Hunter Water did not notify IPART at the time as Hunter Water was awaiting NSW Health's endorsement of the revised CCP. It is recognised that this notification should have occurred at the same time as notification to NSW Health.</p> <p>Liaison with IPART in relation to the issue and consultation with NSW Health.</p> <p>On receipt of this Statement of Compliance.</p>

C Audit process

C.1 Audit programme

We apply our Compliance and Enforcement Policy in developing the annual audit scopes.⁵ The policy explains our risk-based regulatory model. Under the policy, we can:

- focus on allocating resources to areas of higher risk
- increase our efficiency in undertaking audits
- tailor our enforcement response.

Our risk-based approach centres around evaluating the risk that each part of our regulatory function aims to reduce. We evaluate risks by considering the likelihood of harm occurring in the absence of our regulatory controls and the potential consequence of that harm. We then consider how likely it is that a regulated entity will not properly implement a regulatory control.

We identify and document historical, current and emerging risks. This allows us to allocate resources proportionately to the risk and complexity of a regulated entity and its behaviours.

The audit process involves receiving and reviewing reports, undertaking and attending audit interviews with Hunter Water staff, and undertaking field verification to investigate how effectively the requirements of the licence are met in practice. This year, we undertook these interviews remotely while field verification visits were undertaken by a combination of physical and virtual inspections.

C.2 2021 audit scope

We do not audit all licence clauses annually. Instead we adopt a risk-based audit approach, which means we audit 'high risk' clauses more frequently and 'low risk' clauses less frequently. We conduct audits in accordance with our Public Water Utility Audit Guideline.⁶

The audit scope for Hunter Water's 2021 audit included obligations on:

- Licence context and authorisation (Part 1) – making services available, Licence availability and pricing
- Supply services and performance standards (Part 3) – drinking water and recycled water quality management and system performance standards for service interruptions
- Organisational systems management (Part 4) – asset, environmental and quality management systems
- Customer and stakeholder relations (Part 5) – customer contract, external dispute resolution, provision of information to customers and the general public
- Performance monitoring and reporting (Part 6) – operational audits, Reporting Manual and provision of audit information to IPART and the Auditor

We did not audit clauses from Part 2 (Water Conservation) of the Licence this year.

The audit scope is in Appendix D.

We also consulted with NSW Health and Department of Planning and Environment (DPE) and sought public submissions to determine the scope of the audit. We received submissions from NSW Health and DPE. We received one public submission that was outside the scope of the audit, but we can consider in the next pricing review.

All submissions from stakeholder agencies indicated that they were generally satisfied that Hunter Water had met its obligations under the Licence relevant to their portfolio.

In finalising the audit scope, NSW Health suggested that IPART consider adding the following to the scope:

- site visits to Gresford and Lemon Tree Passage water treatment plants, Edgeworth, Cessnock and Kurri Kurri recycled water schemes
- review of the turbidity critical control point for groundwater sources systems
- review of the algal monitoring and response to the significant algal bloom from ~Dec 2020 onward
- review of the reservoir inspection and hygienic pipe repair program
- involvement in a risk assessment for dual reticulation scheme that includes a purple pipe main being used for drinking water.

C.3 2021 audit plan

We engaged Cardno in partnership with Risk Edge and Atom Consulting to undertake the 2021 Hunter Water audit.

We held a project start-up meeting with the auditor on 27 August 2021 to agree on the project milestones, audit timing, and outline our expectations. We participated in the audit inception meeting with Hunter Water and the auditor on the first day of the audit interviews, on 2 November 2021. At this meeting, we agreed on expectations and protocols for the conduct of the audit. All parties adhered to the agreed protocols throughout the audit.

We required the auditor to undertake the following tasks:

1. review stakeholder submissions
2. prepare an information request (questionnaire) setting out all the requirements for information and evidence, at least two weeks prior to the commencement of audit interviews (for this audit, the auditor issued the questionnaire before the audit interviews commence)
3. review reports and documents provided by Hunter Water in response to the questionnaire
4. conduct interviews with Hunter Water staff as appropriate⁷
5. conduct field verification to assess the implementation of Hunter Water's systems and procedures
6. assess the level of compliance (in line with our compliance grades) Hunter Water achieved for each of the identified Licence obligations, and provide supporting evidence for this assessment

7. assess and report on progress by Hunter Water in addressing any comments made by the relevant Minister and/or our recommendations from previous audits, providing supporting evidence for these assessments
8. verify the calculation of performance indicators associated with requirements of the relevant licence and assess trends in performance arising from these indicators
9. provide draft audit reports to us and address comments from Hunter Water and us regarding draft audit findings
10. prepare and submit a final report outlining audit findings (Appendix E).

The auditor adopted a methodology consistent with IPART's Audit Guideline Public Water Utilities (July 2019). This guideline defines IPART's requirements of an audit, ensuring that it is conducted in accordance with an established and recognised audit protocol. The auditor can make recommendations or suggest opportunities for improvement under the guideline.

Where appropriate, the auditor also sought guidance from *ASAE 3100 (2017) Compliance Engagements issued by the Auditing and Assurance Standards Board*, *AS/NZS ISO 19011:2019 Guidelines for auditing management systems*, *AS/NZS ISO 9001:2016: Quality management systems – Requirements*, *ISO 17021:2015 Conformity Assessment* and *AS ISO 31000:2018 Risk management*.

Where we support an auditor's recommendation, we make a recommendation based on the auditor's recommendation. Our recommendations are summarised in section 2 of this report.

Where the auditor suggests opportunities for improvement, Hunter Water can decide whether to implement these suggestions. This approach aims to balance improved performance with the investment required to achieve it, i.e. we want Hunter Water to first consider the pricing implications and value for money of continued improvement. Therefore, while we encourage Hunter Water to consider the auditor's suggestions, we do not follow these up. The auditor's suggested opportunities for improvement are included in the auditor's report in Appendix E.

The auditor conducted audit interviews from 2 November 2021 to 4 November 2021 remotely using online video conferencing facilities. On 3 November 2021 the auditor also undertook a site visit to the following locations:

- Kurri Kurri Wastewater Treatment Works
- Lemon Tree Passage Water Treatment Plant
- Abermain Reservoir and Trunk Valve

The auditor assessed Hunter Water's compliance with the relevant requirements of the Licence per the compliance grades outlined in Appendix A.

D 2021 audit scope

2021 operational audit scope Hunter Water Corporation

2021 audit scope

This document sets out the 2021 operational audit scope for Hunter Water Corporation (Hunter Water). Auditors should note any directions in the comments column of Table 2.

Audit period

The audit period is 1 November 2020 to 31 October 2021. We expect that interviews for the audit will be held in November 2021. However, this is subject to change depending on auditor availability.

Outstanding audit recommendations

Table 3 outlines outstanding audit recommendations. The auditor is required to review these recommendations to determine progress. We report on outstanding audit recommendations separately within IPART's operational audit report to the Minister.

Statement of compliance

The utility is required to provide a Statement of Compliance (SC), signed by the CEO and a Board Member, by 1 September. The SC is an exception based report that outlines any non-compliance with licence clauses during the previous financial year. It also identifies what remedial action has been, or is being taken, with respect to these non-compliances.

The SC covers all licence clauses regardless of whether they are scheduled to be audited in that year. The SC may cause a late variation to the audit scope to allow non-compliances to be reviewed if necessary.

Interpretation

In the case of any discrepancies between the *Hunter Water Operating Licence 2017-2022* (licence) and the audit scope, the licence will prevail.

Field verification locations

Table 4 lists the locations that we have visited in previous audits. Together with Hunter Water, we will determine the locations that we will visit in the 2021 audits and advise the auditor before the field verification visits are scheduled to commence.

Table 1 Key

Requirement	Meaning
Audit/Internal IPART check	Audit/check clause in 2021 audit
SC	Audit of this clause not required in the 2021 audit unless the utility's Statement of Compliance identifies a non-compliance or we become aware of other reasons to audit the clause.
NR	No requirement for audit.

Table 2 2021 Audit scope for Hunter Water

Licence clause	Operating Licence obligation	2021 audit requirement	Comments for the auditor
1	Licence Context and authorisation		
1.1	Objectives of this Licence		
1.1.1	This licence aims to: <ul style="list-style-type: none"> a) provide transparent and auditable terms and conditions for Hunter Water to lawfully undertake its activities at industry good-practice; b) recognise the interests of stakeholders within its Area of Operations; and c) impose the minimum regulatory burden on Hunter Water by avoiding duplication or conflict with other regulatory instruments. 	NR	Information clause – does not require audit.
1.2	Licence authorisation		
1.2.1	This Licence authorises and requires Hunter Water to provide, construct, operate, manage and maintain efficient, co-ordinated and commercially viable systems and services for supplying water, providing sewerage services, and disposing of Wastewater within its Area of Operations.	NR	Authorisation clause – does not require audit.
1.2.2	This Licence authorises Hunter Water to do all things necessary or convenient to achieve, and to promote the capability to achieve, the transfer of water between its Area of Operations and the local government area of the Central Coast Council in accordance with the Hunter/Central Coast Pipeline Agreement.	NR	Authorisation clause – does not require audit.
1.2.3	This Licence authorises and requires Hunter Water to provide, operate, manage and maintain a drainage service as described in section 13(1)(b) of the Act.	NR	Authorisation clause – does not require audit.
1.2.4	This Licence authorises (but does not require) Hunter Water to provide, construct, operate, manage and maintain a drainage service within the Area of Operations in excess of the drainage service it is required to provide, operate, manage and maintain under clause 1.2.3. For the avoidance of any doubt, this clause authorises (but does not require) Hunter Water to enhance, expand and add capacity to the drainage service described in section 13(1)(b) of the Act.	NR	Authorisation clause – does not require audit.

Licence clause	Operating Licence obligation	2021 audit requirement	Comments for the auditor
1.3	Term of Licence		
1.3.1	The term of this Licence is 5 years from the Commencement Date. [Note: This Licence starts on 1 July 2017, which means that it will end on 30 June 2022.]	NR	Licence term clause – does not require audit.
1.4	Licence amendment		
1.4.1	Subject to the Act and clause 1.4.2, this Licence may be amended by the Governor by notice in the New South Wales Government Gazette. The amendment takes effect on the date the notice is published in the New South Wales Government Gazette, or on such other date specified in the notice.	NR	Information clause – does not require audit.
1.4.2	Before any notice of an amendment to this Licence is published in the New South Wales Government Gazette, the Minister must give Hunter Water reasonable notice of the proposed amendment to enable it to comply with the amended Licence (if relevant) upon its commencement.	NR	Information clause – does not require audit.
1.5	Obligation to make Services available		
1.5.1	Subject to Hunter Water continuing to comply with any applicable law, Hunter Water must provide the Services on request to any Property situated in the Area of Operations which is connected to, or for which a connection is available to: <ul style="list-style-type: none"> a) in the case of supplying water, the Water Supply System; and b) in the case of providing sewerage services and/or disposing of Wastewater, the Sewerage System. 	Audit	We last audited this clause in 2018. We assigned a Compliant grade in that audit.
1.5.2	Subject to Hunter Water continuing to comply with any applicable law, Hunter Water must provide the Services on request to any WIC Act Licensee for ultimate end-use within the Area of Operations, where that WIC Act Licensee is connected to, or where a connection is available in respect of that WIC Act Licensee to: <ul style="list-style-type: none"> a) in the case of supplying water, the Water Supply System; and b) in the case of providing sewerage services and/or disposing of Wastewater, the Sewerage System. 	Audit	We last audited this clause in 2018. We assigned a Compliant grade in that audit.
1.5.3	Hunter Water may impose any lawful conditions it sees fit on the making available of Services under clause 1.5.1 or clause 1.5.2, to ensure the safe, reliable and financially viable supply of the Services in accordance with this Licence.	NR	Information clause – does not require audit.
1.6	Non-exclusive Licence		
1.6.1	This Licence does not prohibit another person from providing Services in the Area of Operations that are the same as, or similar to, the Services, if the person is lawfully entitled to do so.	NR	Information clause – does not require audit.

Licence clause	Operating Licence obligation	2021 audit requirement	Comments for the auditor				
1.7	Making copies of this Licence available						
1.7.1	Hunter Water must make a copy of this Licence available to any person, free of charge: <ul style="list-style-type: none"> a) on its website for downloading; and b) upon request made through the General Enquiry Process. 	Internal IPART check	This clause is not included in the auditor's scope.				
1.8	Pricing						
1.8.1	Subject to the terms of this Licence, the Act and the IPART Act, Hunter Water must set the level of fees, charges and other amounts payable for its Services in accordance with any applicable determination or determinations under the IPART Act.	Audit	We last audited this clause in 2018, 2019 and 2020. We assigned Non-compliant (non-material) grades in those three audits Auditor should check the Recommendation 2019-06 for completion, relevant to this clause (see Table 3).				
1.9	End of term review						
1.9.1	It is anticipated that a review of this Licence will commence in the first quarter of 2021 to investigate: <ul style="list-style-type: none"> a) whether this Licence is fulfilling its objectives; and b) any issues which have arisen during the term of this Licence, which may affect the effectiveness of this Licence, (End of Term Review)	NR	Information clause – does not require audit.				
1.9.2	Hunter Water must provide to the person undertaking the End of Term Review such information as is reasonably required to enable the person to undertake the End of Term Review.	NR	Information clause – does not require audit.				
1.10	Notices						
1.10.1	Any notice or other communication given under this Licence must be made in writing addressed to the intended recipient at the address shown below or the last address notified by the recipient. <table border="1"> <thead> <tr> <th>Hunter Water</th> <th>IPART</th> </tr> </thead> <tbody> <tr> <td>The Managing Director Hunter Water Corporation 36 Honeysuckle Drive Newcastle West NSW 2302</td> <td>The Chief Executive Officer Independent Pricing and Regulatory Tribunal Level 15, 2-24 Rawson Place Sydney NSW 2000</td> </tr> </tbody> </table>	Hunter Water	IPART	The Managing Director Hunter Water Corporation 36 Honeysuckle Drive Newcastle West NSW 2302	The Chief Executive Officer Independent Pricing and Regulatory Tribunal Level 15, 2-24 Rawson Place Sydney NSW 2000	NR	Information clause – does not require audit.
Hunter Water	IPART						
The Managing Director Hunter Water Corporation 36 Honeysuckle Drive Newcastle West NSW 2302	The Chief Executive Officer Independent Pricing and Regulatory Tribunal Level 15, 2-24 Rawson Place Sydney NSW 2000						
2	Water Conservation						
2.1	Catchment to water treatment plants						
2.1.1	Hunter Water must calculate the System Yield either:	SC					

Licence clause	Operating Licence obligation	2021 audit requirement	Comments for the auditor
	a) in accordance with the memorandum of understanding with the Department of Primary Industries Water referred to in clause 5.10.1(a); or b) if no such memorandum of understanding is in effect, in accordance with a reasonable methodology that Hunter Water considers suitable.		
2.1.2	By 1 November 2018, or by a later date as approved by IPART, Hunter Water must submit to IPART a report outlining Hunter Water’s water conservation strategy in relation to its system operating arrangements for Water Storage and Transmission (Water Conservation Strategy).	NR	
2.1.3	The Water Conservation Strategy must include: a) identification and documentation of the existing water conservation activities; b) a process for identifying additional options for conserving water; c) a process for comparing these options; and d) a process for selecting options for implementation.	SC	
2.1.4	By 1 September 2019, or by a later date as approved by IPART, Hunter Water must develop and submit to IPART a water conservation work program using the process set out in the Water Conservation Strategy.	NR	

Licence clause	Operating Licence obligation	2021 audit requirement	Comments for the auditor
2.2	Water treatment plants to tap		
2.2.1	<p>Hunter Water must ensure that the 5 year rolling average for annual residential water consumption calculated for each financial year is equal to or less than 215 kilolitres for each Property used for residential purposes which is connected to the Water Supply System (Water Conservation Target), until Hunter Water has obtained IPART's approval for the Economic Level of Water Conservation Methodology (in accordance with clauses 2.2.2 and 2.2.3), and developed a program of water conservation activities using the approved Economic Level of Water Conservation Methodology (in accordance with 2.2.4).</p> <p>[Note: Clause 2.2.1 requires Hunter Water to maintain the Water Conservation Target that was in the immediate predecessor to this Licence while the Economic Level of Water Conservation Methodology is being approved and applied.]</p>	NR	
2.2.2	<p>By 1 November 2017, Hunter Water must submit to IPART for IPART's approval a report outlining Hunter Water's proposed approach to, and principles for, developing a methodology for determining its economic level of water conservation in relation to (at a minimum) the following elements:</p> <ul style="list-style-type: none"> a) water leakage (within and downstream of its water treatment plants); b) water recycling; and c) water efficiency (including demand management). 	NR	
2.2.3	<p>By 1 November 2018, or by a later date as approved by IPART, Hunter Water must submit to IPART for IPART's approval the proposed methodology for determining its economic level of water conservation in accordance with the approach and principles approved by IPART (Economic Level of Water Conservation Methodology). IPART may refuse approval of the methodology and require Hunter Water to resubmit it by a specified date after making changes requested by IPART, or approve the methodology unconditionally, or approve the methodology subject to conditions. Hunter Water must comply with any such conditions.</p>	NR	
2.2.4	<p>By 1 September 2019, or by a later date as approved by IPART, Hunter Water must develop and submit a water conservation work program using the Economic Level of Water Conservation Methodology.</p>	NR	
2.2.5	<p>Hunter Water must obtain IPART's written consent to make any changes to the Economic Level of Water Conservation Methodology (other than changes to correct minor grammatical or typographical errors).</p>	SC	

Licence clause	Operating Licence obligation	2021 audit requirement	Comments for the auditor
3	Supply services and performance standards		
3.1	Drinking Water		
3.1.1	<p>Hunter Water must maintain a Management System for Drinking Water that is consistent with the Australian Drinking Water Guidelines, except to the extent that NSW Health specifies otherwise in writing (the Drinking Water Quality Management System).</p> <p>[Note: It is expected that the Drinking Water Quality Management System will be consistent with the Framework for Management of Drinking Water Quality. However, where NSW Health considers it appropriate, the application of Australian Drinking Water Guidelines may be amended or added to, to take account of Hunter Water's circumstances and/ or Drinking Water quality policy and practices within New South Wales.</p> <p>The Australian Drinking Water Guidelines has provisions relating to the prevention of use of non-potable water for potable purposes.]</p>	Audit	<p>We audited this clause in 2018, 2019 and 2020. We assigned a Compliant (minor shortcomings) grade in the 2018 audit and a Compliant grade in the 2019 and 2020 audits.</p> <p>In 2020 elements 1, 2, 3, 4, 5, 6, 8, 10 and 12 were audited. This year, we will audit Australian Drinking Water Guidelines elements 1, 2, 3, 4, 5, 6, 9, 10, 11, and 12.</p> <p>We have sought NSW Health's comments on Hunter Water's performance against this clause. Please consider NSW Health's comments in its submission.</p>
3.1.2	Hunter Water must ensure that the Drinking Water Quality Management System is fully implemented and that all relevant activities are carried out in accordance with the Drinking Water Quality Management System, and to the satisfaction of NSW Health.	Audit	<p>We audited this clause in 2018, 2019 and 2020. We assigned a Compliant grade in the 2018 and 2019 audits and a Compliant (minor shortcomings) grade in the 2020 audit.</p> <p>In 2020 elements 1, 2, 3, 4, 5, 6, 8, 10 and 12 were audited. We will only audit implementation of Hunter Water's management system against elements 1, 2, 3, 4, 5, 6, 9, 10, 11, and 12. of the Australian Drinking Water Guidelines.</p> <p>Auditor should check the Recommendation 2020-01 for completion, relevant to this clause (see Table 3).</p>

Licence clause	Operating Licence obligation	2021 audit requirement	Comments for the auditor
			We have sought NSW Health's comments on Hunter Water's performance against this clause. Please consider NSW Health's comments in its submission.
3.2	Recycled Water		
3.2.1	Hunter Water must maintain a Management System for Recycled Water that is consistent with the Australian Guidelines for Water Recycling, except to the extent that NSW Health specifies otherwise in writing (the Recycled Water Quality Management System).	Audit	<p>We audited this clause in 2018, 2019 and 2020. We assigned a Compliant (minor-shortcomings) and Non-compliant (non-material) grade in the 2018 and 2019 audits. We assigned a Compliant (minor shortcomings) grade in the 2020 audit.</p> <p>In 2020 we audited elements 2, 3, 4, 5, 6, 8 and 12.</p> <p>This year we will audit Australian Guidelines for Water Recycling Framework elements 1, 2, 3, 4, 5, 9, 10, 11 and 12.</p> <p>Auditor should check the following recommendations relevant to this clause for progress/ completion (see Table 3):</p> <ul style="list-style-type: none"> - 2020-02 - 2013-14-03 - 2013-14-04 - 2013-14-06 - 2013-14-13. <p>We have sought NSW Health's comments on Hunter Water's performance against this clause. Please consider NSW Health's comments in its submission.</p>

Licence clause	Operating Licence obligation	2021 audit requirement	Comments for the auditor
3.2.2	Hunter Water must ensure that the Recycled Water Quality Management System is fully implemented and that all relevant activities are carried out in accordance with the Recycled Water Quality Management System, and to the satisfaction of NSW Health.	Audit	<p>We audited this clause in 2018, 2019 and 2020. We assigned Compliant grades in the 2018 and 2019 audits and a Compliant (minor-shortcomings) grade in the 2020 audit.</p> <p>We will only audit implementation of Hunter Water's management system against elements 1, 2, 3, 4, 5, 9, 10, 11 and 12 of the Australian Guidelines for Water Recycling.</p> <p>Auditor should check the following recommendations relevant to this clause for progress/ completion (see Table 3):</p> <ul style="list-style-type: none"> - 2020-03 - 2020-04 - 2020-05 - 2013-14-03 - 2013-14-04 - 2013-14-06 - 2013-14-13. <p>We have sought NSW Health's comments on Hunter Water's performance against this clause. Please consider NSW Health's comments in its submission.</p>
3.3	System Performance Standards		
3.3.1	<p>Water Pressure Standard</p> <p>a) Hunter Water must ensure that no more than 4,800 Properties experience a Water Pressure Failure in a financial year (Water Pressure Standard).</p> <p>b) A Property is taken to have experienced a Water Pressure Failure at each of the following times:</p> <ol style="list-style-type: none"> i. when a person notifies Hunter Water that the Property has experienced a Water Pressure Failure and that Water Pressure Failure is confirmed by Hunter Water; or ii. when Hunter Water's systems identify that the Property has experienced a Water Pressure Failure. 	Audit	<p>We last audited this clause in 2018 and 2020. We assigned Compliant grades in those audits.</p>

Licence clause	Operating Licence obligation	2021 audit requirement	Comments for the auditor
	<p>c) Despite clause 3.3.1(b), a Property will not be taken to have experienced a Water Pressure Failure if that Water Pressure Failure occurred only because of:</p> <ul style="list-style-type: none"> i. a Planned Water Interruption or Unplanned Water Interruption; ii. water usage by authorised fire authorities in the case of a fire; or iii. iii) a short term or temporary operational problem (such as a main break) which is remedied within four days of its occurrence. 		
3.3.2	<p>Water Continuity Standard</p> <p>a) Hunter Water must ensure that in a financial year:</p> <ul style="list-style-type: none"> i. no more than 10,000 Properties experience an Unplanned Water Interruption that lasts more than five continuous hours; and ii. no more than 5,000 Properties experience three or more Unplanned Water Interruptions that each last more than one hour, <p>(Water Continuity Standard).</p> <p>b) For the purposes of clause 3.3.2(a), Hunter Water must use the best available data (taking account of water pressure data where that data is available) to determine of:</p> <ul style="list-style-type: none"> i. whether a Property has experienced an Unplanned Water Interruption; and ii. the duration of the Unplanned Water <p>c) If a Property experiences an Unplanned Water Interruption that was caused by a third party, that Property is taken not to have experienced an Unplanned Water Interruption for the purposes of clause 3.3.2(a).</p>	Audit	We last audited this clause in 2018 and 2020. We assigned Compliant grades in those audits.
3.3.3	<p>Wastewater Overflow Standard</p> <p>a) Hunter Water must ensure that in a financial year:</p> <ul style="list-style-type: none"> i. no more than 5,000 Properties experience an Uncontrolled Wastewater Overflow in dry weather; and ii. no more than 45 Properties experience three or more Uncontrolled Wastewater Overflow in dry weather, <p>(Wastewater overflow Standard).</p>	Audit	We last audited this clause in 2018 and 2020. We assigned Compliant grades in those audits.
3.3.4	<p>Hunter Water must survey its Customers by 30 June 2020 for the purpose of informing a review of System Performance Standards and rebates.</p> <p>[Note: Clause 3.3.4 is not intended to prevent Hunter Water:</p> <ul style="list-style-type: none"> a) surveying its Customers and Consumers for any lawful purpose at such times as it sees fit; or b) using the survey required by that clause to survey its Customers and Consumers on topics additional to the topic referred to in that clause.] 	NR	

Licence clause	Operating Licence obligation	2021 audit requirement	Comments for the auditor
3.3.5	<p>Interpretation of standards</p> <p>a) For the purposes of the Water Pressure Standard and Water Continuity Standard, each separately billed part of a Multiple Occupancy Property is to be counted as a separate Property.</p> <p>[Note: For example, a complex of five townhouses where each townhouse receives a separate bill from Hunter Water is to be counted as five separate Properties. However, a block of flats that only receives one bill from Hunter Water is to be counted as one Property.]</p> <p>b) For the purposes of the Wastewater Overflow Standard, a Multiple Occupancy Property is considered to be one Property.</p> <p>[Note: For example, a complex of five townhouses where each townhouse receives a separate bill from Hunter Water is to be counted as one Property.]</p> <p>c) the case of any ambiguity in the interpretation or application of any of the standards set out in this clause 3.3, IPART's interpretation of the relevant standard or assessment of its application will prevail.</p>	NR	Information clause – does not require audit.
4	Organisational Systems Management		
4.1	Asset Management System		
4.1.1	By 31 December 2017, Hunter Water must develop a Management System for carrying out the functions authorised under this Licence that is consistent with the Australian Standard AS ISO 55001:2014 Asset management - Management systems - Requirements, or other standard approved by IPART on request by Hunter Water (the Asset Management System).	NR	
4.1.2	By 1 July 2018, Hunter Water must ensure that the Asset Management System is fully implemented and must, from that date, ensure that all relevant activities are carried out in accordance with the Asset Management System.	Audit	<p>We audited this clause in 2018, 2019 and 2020. We assigned Compliant grades in those audits.</p> <p>Auditor to check that the Asset Management System (AMS) is fully implemented, noting that Hunter Water achieved certification of its AMS on 11 July 2018.</p>
4.1.3	Until the Asset Management System has been implemented in accordance with clause 4.1.2, Hunter Water must ensure that all relevant activities are carried out in accordance with the previous asset management system that was required under the operating licence held by Hunter Water which commenced in 2012.	NR	

Licence clause	Operating Licence obligation	2021 audit requirement	Comments for the auditor
	[Note: This clause permits Hunter Water to transition its previous asset management system based on the Water Services Association of Australia's Aquamark benchmarking tool to the Australian Standard AS ISO 55001:2014 Asset management - Management systems – Requirements.].		
4.2	Environmental management system		
4.2.1	Hunter Water must at all times maintain a Management System for carrying out the functions authorised under this Licence that is consistent with the Australian/New Zealand Standard AS/NZS ISO 14001:2016 Environmental management systems – Requirements with guidance for use, or other standard approved by IPART on request by Hunter Water (the Environmental Management System).	Audit	We last audited this clause in 2018. We assigned a Compliant grade in that audit.
4.2.2	Hunter Water must fully implement, and carry out all relevant activities in accordance with, the Environmental Management System.	Audit	We last audited this clause in 2018. We assigned a Compliant (minor shortcomings) grade in that audit.
4.3	Quality Management System		
4.3.1	Hunter Water must at all times maintain a Management System for carrying out the functions authorised under this Licence that is consistent with the Australian/New Zealand Standard AS/NZS ISO 9001:2016 Quality management systems – Requirements, or other standard as approved by IPART on request by Hunter Water (the Quality Management System).	Audit	This is the first audit of this clause in this licence period.
4.3.2	Hunter Water must fully implement, and carry out all relevant activities in accordance with, the Quality Management System.	Audit	This is the first audit of this clause in this licence period.
5	Customers and stakeholder relations		
5.1	Customer Contract		
5.1.1	The terms and conditions of the Customer Contract are as set out in Schedule B of this Licence. [Note: Section 38 of the Act makes provision for the amendment of the Customer Contract.].	NR	Information clause – does not require audit
5.1.2	Before publishing a notice under section 38 of the Act for the purpose of varying the terms and conditions of the Customer Contract, Hunter Water must provide IPART with a copy of the notice.	Internal IPART check	This clause is not included in the auditor's scope.
5.2	Consumers		
5.2.1	Hunter Water's obligations under the Customer Contract relating to: a) Complaint handling and Complaint resolution procedures; and b) redress (clause 16.3 of the Customer Contract) and claims for damages (clause 16.4 of the Customer Contract) are extended to those Consumers who are not parties to the Customer Contract.	NR	Information clause – does not require audit.

Licence clause	Operating Licence obligation	2021 audit requirement	Comments for the auditor
5.3	Payment difficulties and actions for non-payment		
5.3.1	<p>Hunter Water must maintain and fully implement the following:</p> <ul style="list-style-type: none"> a) a financial hardship policy that assists residential Customers and Consumers experiencing financial hardship to better manage their current and future bills; b) procedures relating to a payment plan for residential Customers and Consumers who are responsible for paying their bills and who are, in Hunter Water's opinion, experiencing financial hardship; c) procedures for identifying the circumstances under which Hunter Water may disconnect or restrict a supply of water in a manner that will affect a Customer or Consumer; and d) provisions for self-identification, identification by community welfare organisations and identification by Hunter Water of residential Customers and Consumers experiencing financial hardship, <p>(the Procedure for Payment Difficulties and Actions for Non-payment).</p>	SC	
5.4	Customer advisory group		
5.4.1	Hunter Water must maintain and regularly consult with its Customers through a customer advisory group.	SC	
5.4.2	Hunter Water must utilise the customer advisory group to, among other things, obtain advice on the interests of Hunter Water's Customers, the Customer Contract and such other key issues related to Hunter Water's planning and operations as Hunter Water may determine, including the matters set out in section 12(1) of the Act, consistent with the Customer Advisory Group Charter.	SC	
5.4.3	<p>Hunter Water:</p> <ul style="list-style-type: none"> a) must ensure that, at all times, the membership of the customer advisory group is appointed and determined by Hunter Water in accordance with the Customer Advisory Group Charter; b) must use its best endeavours to include, as members of the customer advisory group, at least one Customer representing each of the following categories: <ul style="list-style-type: none"> i. business; ii. organisations representing low income iii. Customers living in rural and urban fringe areas; iv. residential; v. local government; vi. pensioners; vii. Customers with disabilities; viii. Indigenous Australians; and 	SC	

Licence clause	Operating Licence obligation	2021 audit requirement	Comments for the auditor
	<ul style="list-style-type: none"> ix. Customers from culturally and linguistically diverse backgrounds; and c) may include, as members of the customer advisory group, at least one person representing each of the following categories: <ul style="list-style-type: none"> i. business Consumers; ii. residential Consumers; and iii. environmental groups 		
5.4.4	<p>Hunter Water and members of the customer advisory group must, for the term of this Licence, maintain a charter that addresses all of the following issues.</p> <ul style="list-style-type: none"> a) the role of the customer advisory group; b) how members and the Chair of the customer advisory group will be appointed c) the term for which members are appointed d) information on how the customer advisory group will operate; e) a description of the type of matters that will be referred to the customer advisory group and how those matters may be referred; f) procedures for communicating the outcomes of the customer advisory group's work to the public; g) procedures for monitoring issues raised at meetings of the customer advisory group and ensuring appropriate follow-up of those issues; h) procedures for amending the charter; and i) funding and resourcing of the customer advisory group by Hunter Water, <p>(Customer Advisory Group Charter).</p>	SC	
5.4.5	<p>Hunter Water must provide the customer advisory group with information in Hunter Water's possession or under its control necessary to enable the customer advisory group to discharge the tasks assigned to it, other than information or documents that are confidential.</p>	SC	
5.5	Internal complaints handling		
5.5.1	<p>Hunter Water must maintain a procedure for receiving, responding to and resolving Complaints, which is consistent with the Australian/New Zealand Standard AS/NZS 10002:2014 – Guidelines for complaint management in organizations (the Internal Complaints Handling Procedure).</p>	SC	
5.5.2	<p>Hunter Water must ensure that the Internal Complaints Handling Procedure is fully implemented and that all relevant activities are carried out in accordance with the Internal Complaints Handling Procedure.</p>	SC	

Licence clause	Operating Licence obligation	2021 audit requirement	Comments for the auditor
5.6	External Dispute Resolution scheme		
5.6.1	Hunter Water must be a member of the Energy and Water Ombudsman NSW to facilitate the resolution, by a dispute resolution body, of disputes between Hunter Water and its Customers or Consumers.	Internal IPART check	This clause is not included in the auditor's scope.
5.7	Provision of information to Customers and the general public		
5.7.1	<p>Hunter Water must prepare a pamphlet or pamphlets with the following information to Customers at least annually with their bills:</p> <ul style="list-style-type: none"> a) a brief explanation of the Customer Contract and a summary of the key rights and obligations of Customers under the Customer Contract; b) a brief explanation of the Procedure for Payment Difficulties and Actions for Non-payment; c) a brief explanation of rights of Customers to claim a rebate and the conditions that apply to those rights; d) information about the General Enquiry Process; e) information about how to make a Complaint under the Internal Complaints Handling Procedure; and f) a brief explanation of the external dispute resolution service, how to access that service, and Customers rights to have a Complaint or dispute referred to Energy and Water Ombudsman NSW. 	Audit	This is the first audit of this clause in this licence period.
5.7.2	<p>Hunter Water must make a copy of the following documents available to any person, free of charge on its website for downloading and upon request through the General Enquiry Process:</p> <ul style="list-style-type: none"> a) the Customer Contract; b) a pamphlet or pamphlets (as referred to in clause 5.7.1); c) the Procedure for Payment Difficulties and Actions for Non-payment; d) the Customer Advisory Group Charter; e) customer advisory group minutes; f) the Internal Complaints Handling Procedure; g) information about the dispute resolution scheme provided by Energy and Water Ombudsman NSW; and h) a map of the Area of Operations. 	Internal IPART check	This clause is not included in the auditor's scope.
5.7.3	Hunter Water must update the pamphlet or pamphlets prepared under clause 5.7.1 and documents on its website under clause 5.7.2 to reflect any variations made to the information within 60 days of the commencement of the variations.	SC	

Licence clause	Operating Licence obligation	2021 audit requirement	Comments for the auditor
5.8	Code of Conduct with WIC Act Licensee		
5.8.1	Hunter Water must use reasonable endeavours to cooperate with any WIC Act Licensee that seeks to establish with Hunter Water a code of conduct required under a licence under the WIC Act.	SC	
5.8.2	Where the Minister administering the WIC Act has established a code of conduct under clause 25 of the WIC Regulation, Hunter Water will be taken to have satisfied its obligation under clause 5.8.1 by applying the water industry code of conduct established by the Minister to the relevant WIC Act Licensee.	NR	Information clause – does not require audit.
5.9	Memorandum of Understanding with NSW Health		
5.9.1	Hunter Water must use its best endeavours to: <ul style="list-style-type: none"> a) maintain a memorandum of understanding with NSW Health; and b) comply with the memorandum of understanding maintained under clause 5.9.1(a). <p>[Note: Clause 5.9.1 does not limit the persons with whom Hunter Water may enter into a memorandum of understanding.]</p>	SC	
5.9.2	The purpose of the memorandum of understanding referred to in clause 5.9.1(a) is to form the basis for co-operative relationships between the parties to the memorandum of understanding. In particular, the purpose of the memorandum of understanding referred to in clause 5.9.1(a) is to recognise the role of NSW Health in providing advice to the NSW Government in relation to Drinking Water quality standards and the supply of water that is safe to drink.	NR	Information clause – no audit required.
5.9.3	The memorandum of understanding referred to in clause 5.9.1(a) must include arrangements for Hunter Water to report to NSW Health information on any events in relation to Hunter Water's systems or Services that might pose a risk to public health.	SC	
5.9.4	Hunter Water must provide NSW Health with information relating to water quality in the manner and form specified by NSW Health within a reasonable period of time of receiving NSW Health's request. <p>[Note: The obligation in clause 5.9.4 is in addition to Hunter Water's obligation to comply with any information requests made under section 19 of the Public Health Act 2010 (NSW) by the Secretary of the NSW Ministry of Health.]</p>	SC	

Licence clause	Operating Licence obligation	2021 audit requirement	Comments for the auditor
5.10	Memorandum of Understanding with Department of Primary Industries - Water		
5.10.1	<p>Hunter Water must use its best endeavours to:</p> <p>a) maintain a memorandum of understanding (which may be referred to as a roles and responsibilities protocol) with the Department of Primary Industries Water in relation to:</p> <p>i. the roles and responsibilities for the Department of Primary Industries Water and Hunter Water in respect of the review and implementation of the Lower Hunter Water Plan; and</p> <p>ii. calculation and reporting of System Yield; and</p> <p>b) comply with the memorandum of understanding maintained under clause 5.10.1(a).</p> <p>[Note: Clause 5.10.1 does not limit the persons with whom Hunter Water may enter into a memorandum of understanding or a roles and responsibilities protocol.]</p>	SC	We have sought the Department of Planning, Industry and Environment's (DPIE) comments on Hunter Water's performance against this clause. Please consider DPIE's comments in its submission.
5.10.2	The purpose of the memorandum of understanding referred to in clause 5.10.1(a) is to form the basis for a co-operative relationship between the parties to the memorandum of understanding. In particular, the purpose of the memorandum of understanding referred to in clause 5.10.1(a) is to recognise the role of Department of Primary Industries Water in assessing options to address water supply security in the lower Hunter region.	NR	Information clause – does not require audit.
5.11	Memorandum of understanding with Fire and Rescue NSW (FRNSW)		
5.11.1	<p>Hunter Water must use its best endeavours to:</p> <p>a) develop and enter into a memorandum of understanding with FRNSW by 31 December 2017; and</p> <p>b) once the memorandum of understanding referred to in clause 5.11.1(a) is developed and entered into, comply with the memorandum of understanding.</p> <p>[Note: Clause 5.11.1 does not limit the persons with whom Hunter Water may enter into a memorandum of understanding.]</p>	SC	We have sought the Fire and Rescue NSW's (FRNSW) comments on Hunter Water's performance against this clause. FRNSW did not provide a submission.
5.11.2	<p>The purpose of the memorandum of understanding referred to in clause 5.11.1 is to form the basis for co-operative relationships between the parties to the memorandum of understanding. In particular, the purpose of clause 5.11.1 is to:</p> <p>a) develop the roles and responsibilities of the parties to the memorandum of understanding as they relate to each other;</p> <p>b) identify the needs and constraints of the parties to the memorandum of understanding as they relate to each other; and</p>	NR	Information clause – does not require audit.

Licence clause	Operating Licence obligation	2021 audit requirement	Comments for the auditor
	c) identify and develop strategies for efficient and effective provision of firefighting water consistent with the goals of each party to the memorandum of understanding.		
5.11.3	<p>The memorandum of understanding referred to in clause 5.11.1 must require:</p> <p>a) the establishment of a working group, comprised of representatives from Hunter Water and FRNSW; and</p> <p>b) the working group to consider the following matters (at a minimum):</p> <ol style="list-style-type: none"> i. arrangements regarding information sharing between Hunter Water and FRNSW; ii. agreed timelines and a format for Hunter Water to provide a report to FRNSW detailing the network performance with regard to availability of water for firefighting (taking into account the minimum available flow and pressure in localised areas of the network); iii. arrangements for Hunter Water to consult with FRNSW in the design of new assets and planning of system maintenance, where modelling indicates that minimum available flow and pressure may unduly affect firefighting in the network section under consideration; and iv. other matters as agreed by both parties to the memorandum of understanding. 	NR	Information clause – does not require audit.
6	Performance monitoring and reporting		
6.1	Operational audits		
6.1.1	<p>IPART may annually, or from time to time as occasion requires, undertake, or may appoint an Auditor to undertake, an audit on Hunter Water's compliance with:</p> <p>a) this Licence;</p> <p>b) the Reporting Manual; and</p> <p>c) any matters required by the Minister, (Operational Audit).</p>	NR	Information clause – does not require audit.
6.1.2	Hunter Water must provide to IPART or the Auditor all information in Hunter Water's possession, or under Hunter Water's custody or control, which is necessary or convenient for the conduct of the Operational Audit.	Internal IPART check	This clause is not included in the auditor's scope.
6.1.3	Without limiting clause 6.1.2, Hunter Water must provide to IPART or the Auditor any information necessary or convenient for the conduct of the Operational Audit which IPART or the Auditor requests in writing, within any reasonable period of time specified by IPART or the Auditor in writing.	Internal IPART check	This clause is not included in the auditor's scope.

Licence clause	Operating Licence obligation	2021 audit requirement	Comments for the auditor
6.1.4	<p>For the purposes of any Operational Audit or verifying a report on an Operational Audit, Hunter Water must, within a reasonable period of time from receiving a request from IPART or an Auditor, permit IPART or the Auditor to:</p> <ul style="list-style-type: none"> a) access any works, premises or offices occupied by Hunter Water; b) carry out inspections, measurements and tests on, or in relation to, any such works, premises or offices; c) take on to any such premises or offices, any person or equipment necessary for the purposes of performing the Operational Audit or verifying any report on the Operational Audit; d) inspect and make copies of, and take extracts from, any books and records of Hunter Water that are maintained in relation to the performance of Hunter Water's obligations under this Licence (including obligations under the Reporting Manual); and e) discuss matters relevant to the Operational Audit or any report on the Operational Audit with Hunter Water, including Hunter Water's officers and employees. 	Internal IPART check	This clause is not included in the auditor's scope.
6.2	Reporting Manual		
6.2.1	<p>Hunter Water must comply with all of its reporting obligations set out in the Reporting Manual, including in relation to:</p> <ul style="list-style-type: none"> a) water conservation; b) supply services and performance standards; c) organisational systems management; d) customer and stakeholder relations; and e) performance monitoring and reporting, including: <ul style="list-style-type: none"> i. IPART performance indicators; and ii. the National Water Initiative Performance Indicators 	Audit	We last audited this clause in 2019. We assigned a Compliant grade in that audit.
6.2.2	Hunter Water must maintain sufficient record systems to enable Hunter Water to report accurately in accordance with clause 6.2.1.	Audit	We last audited this clause in 2019. We assigned a Compliant grade in that audit.
6.2.3	<p>In the case of any ambiguity in the interpretation or application of any requirements in the Reporting Manual, IPART's interpretation or assessment will prevail.</p> <p>[Note: The Reporting Manual identifies the details of when, what, to whom and how Hunter Water must report to IPART and NSW Health. The Reporting Manual also specifies what and how reports and other information must be made publicly available.]</p>	NR	Information clause – does not require audit.

Licence clause	Operating Licence obligation	2021 audit requirement	Comments for the auditor
6.3	Provision of Information to IPART and Auditor		
6.3.1	Hunter Water must provide IPART or an Auditor with information relating to the performance of any of Hunter Water's obligations under clause 6.2 (including providing IPART with physical and electronic access to the records required to be kept under clause 6.2) within a reasonable period of time from Hunter Water receiving a request from IPART or an Auditor for that information	Internal IPART check	This clause is not included in the auditor's scope.
6.3.2	Hunter Water must provide IPART or an Auditor with such information as is reasonably required to enable IPART or an Auditor to conduct any review or investigation of Hunter Water's obligations under this Licence within a reasonable period of time from Hunter Water receiving a request from IPART or an Auditor for that information.	Internal IPART check	This clause is not included in the auditor's scope.
6.3.3	If Hunter Water contracts out any of its activities to any person (including a subsidiary) it must take all reasonable steps to ensure that, if required by IPART or an Auditor, any such persons provide information and do the things specified in this clause 6 as if that person were Hunter Water.	Internal IPART check	This clause is not included in the auditor's scope.
6.3.4	Where this Licence requires Hunter Water to provide information to IPART or an Auditor that is information to which: <ul style="list-style-type: none"> a) Section 24FF of the IPART Act applies; or b) Section 24FF of the IPART Act does not apply but IPART or the Auditor has agreed to treat the information as though section 24FF of the IPART Act applies to that information <p>Hunter Water must, to the maximum extent permitted by the law, provide that information even if it is confidential.</p>	Internal IPART check	This clause is not included in the auditor's scope.

Source: IPART, Hunter Water Operational Audit 2018 - Report to the Minister – Compliance Report, March 2019; IPART, Hunter Water Operational Audit 2019 – Report to the Minister – Compliance Report, March 2020; and IPART, Hunter Water Operational Audit 2020 – Report to the Minister, March 2021.

Table 3 Recommendations / outstanding items from previous audits

Recommendation number	Operational issue (licence reference where applicable)	IPART's recommendation to the Minister	Audit findings (Status will be reported by Hunter Water in audit recommendations update on 28 May 2021 ^a)	Guidance for 2021 audit
2020-01	Drinking water Clause 3.1.2	By 30 June 2021, Hunter Water should ensure that minor drinking water quality incidents are all recorded as required by the Corporate Emergency Management Plan.	To be advised.	Auditor to check for completion.
2020-02	Recycled water Clause 3.2.1	By 31 October 2021, Hunter Water should ensure that the quality assurance and validation procedures for sampling are documented in its recycled water quality monitoring plan. The AGWR (Box 2.10) requires that quality assurance details are in a monitoring plan.	To be advised.	Auditor to check for completion.
2020-03	Recycled water Clause 3.2.2	By 31 October 2021, Hunter Water should review the manner in which recycled water quality issues are documented and reported so as to ensure that they are managed and closed out in a consistent manner.	To be advised.	Auditor to check for completion.
2020-04	Recycled water Clause 3.2.2	By 30 June 2021, Hunter Water should review the effectiveness of the Recycled Water Quality Management Plan at the Integrated Management System Review Meeting or at other appropriate senior management meetings.	To be advised.	Auditor to check for completion.
2020-05	Recycled water Clause 3.2.2	By 31 March 2021, Hunter Water should ensure that the Recycled Water Quality Management System Improvement Plan is monitored and improvement tasks are actioned in line with the plan.	To be advised.	Auditor to check for completion.
2019-06	Pricing Clause 1.8.1	By 31 March 2021, Hunter Water must ensure that the proposed functionality for fully automated tankered waste billing is incorporated into the new corporate billing system.	Completion of this recommendation is dependent upon full implementation of Hunter Water's new billing system. We expect completion by 31 December 2021.	Auditor to check for progress.

Recommendation number	Operational issue (licence reference where applicable)	IPART's recommendation to the Minister	Audit findings (Status will be reported by Hunter Water in audit recommendations update on 28 May 2021 ^a)	Guidance for 2021 audit
2013-14-03 2013-14-04 2013-14-06 2013-14-13	Recycled Water Clauses 3.2.1 & 3.2.2	<p>Within 6 months, Hunter Water should review Critical Control Points (CCPs) for each treatment plant, including:</p> <p>a) review all CCP critical limits (including alarm delays), and monitoring points to ensure they reflect current practice, as agreed with NSW Health.</p> <p>(Note: other elements of these recommendations had been fully addressed in previous audits)</p>	<p>Completion of this recommendation requires the addition of two items (one remains outstanding) to the Recycled Water Quality Improvement Plan to meet NSW Health's conditions for approval of the final Validation Plan (i.e. the Validation Testing Program for Water Recycling Schemes).</p>	<p>Auditor to check for completion.</p>

a Hunter Water is required to provide a report on progress by 31 March 2021 or a later date agreed by IPART. Due to the timing of the audit, the Tribunal has agreed to a later date of 28 May 2021 for Hunter Water to report on its progress with the audit recommendations

Note: Licence references are to the Hunter Water Operating Licence 2017-2022 unless otherwise stated.

Source: IPART, Hunter Water Operational Audit 2020 – Report to the Minister, March 2021.

Table 4 Previous field verification locations for Hunter Water

Audit year	Location	Facility
2021	Gresford and Lemon Tree Passage water treatment plants	Water treatment plant
	Edgeworth, Cessnock and Kurri Kurri recycled water schemes	Recycled water scheme
2020	Farley recycled water scheme	Wastewater treatment plant Recycled water treatment plant Gillieston Heights recycled water network
	Tomago sandbeds	Borefield
	Tomago	Grahamstown water treatment plant
	George Schroder pumping station	Schroder PAC dosing facility
	Anna Bay	Water treatment plant
	Nelson Bay	Water treatment plant
	2019	Morpeth
Chisholm		Recycled water network in urban development
Chisholm		Chisholm No. 2 re-chlorination facility
Adamstown Heights		No. 1 & No. 2 reservoirs
Fern Bay		Chemical dosing facility for sewerage network (an environmental improvement site)
2018	North Lambton	Maintenance depot Reservoir
	Lambton	Observed planned maintenance activity (faulty valve replacement works)
	Morpeth	Wastewater treatment works (including recycled water)
	Dungog	Water treatment plant
2017	Kurri Kurri	Wastewater Treatment Plant
	Gresford	Water Treatment Plant and Water Pump Station
	North Lambton	Maintenance Depot and Planned Maintenance repair
	Wallsend	Water Pump Station
	Elmore Vale	Reservoir
2016	Tomago Sandbeds	Borefields
	Lemon Tree Passage	Water Treatment Plant
	Karuah	Wastewater Treatment Plant and the reuse enterprise
	Boulder Bay	Wastewater Treatment Plant
2015	Edgeworth	Wastewater Treatment works
	KIWS (Kooragang Industrial Water Scheme), incl. Mayfield West plant	Advanced Water Treatment Plant (recycled water)

Audit year	Location	Facility
	Grahamstown	Spillway
		Water Treatment Plant
	Campvale	Pumping station
2014	Chichester	Dam
	Dungog	Water Treatment Plant
	Clarence	Sewage Treatment Plant
	Boags Hill	Inlet
	Seaham	Weir
2013	Branxton	Recycled Water Treatment Plant
	Grahamstown	Water treatment plant
2012	Port Stephens	Lemon Tree Passage Water Treatment Plant
	Grahamstown	Dam
	Campvale	Pumping station
	Between Newcastle and Port Stephens	Tomago Sandbeds
	Karuah	Sewage Treatment Plant
2011	Dungog	Water Treatment Plant
	Grahamstown	Water Treatment Plant
	n/a	Service reservoirs and storages
	n/a	Work sites – mains replacement and burst mains repair

E Auditor's report

HWC Operational Audit Report

HWC IPART Audit

3608-86



Prepared for
IPART

7 March 2022

Contact Information

Cardno (Qld) Pty Ltd

ABN 57 051 074 992

Level 11

515 St Paul's Terrace

Suburb State 4006

Australia

www.cardno.com

Phone +61 7 3369 9822

Fax +61 7 3369 9722

Author(s):

Aneurin Hughes (Cardno)

Annette Davison (Risk Edge)

David Bartley (Atom)

Ella Hingston (Cardno)

Approved By:

Aneurin Hughes (Cardno)

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Executive summary

Auditor's declaration

This report presents the findings of the audit of Hunter Water's operations against the *Hunter Water Operating Licence 2017-2022*, consistent with audit requirements set out in IPART's Audit Guideline Public Water Utilities (July 2019), for the period 1 November 2020 to 31 October 2021.

The auditors confirm that:

- > We have seen sufficient evidence on which to base our conclusions
- > Our audit findings accurately reflect the professional opinions of the auditors
- > We have conducted the audit, determined audit findings and prepared the report consistent with audit requirements set out in IPART's Audit Guideline Public Water Utilities (July 2019) and IPART's Request for Quote
- > Our audit findings have not been unduly influenced by the utility and/or any of its associates.

Major findings

A summary of major audit findings for the 2020-21 audit period is shown below.

Summary of audit findings against audited licence obligations

Section	Clause	Sub-clause	Audit grade
1 Licence context and authorisation	1.5 – Obligations to make services available	1.5.1	Compliant
		1.5.2	Not Required
	1.8 – Pricing	1.8.1	Compliant
3 Supply services and performance standards	3.1 – Drinking water	3.1.1	Compliant (minor shortcomings)
		3.1.2	Compliant (minor shortcomings)
	3.2 – Recycled water	3.2.1	Compliant (minor shortcomings)
		3.2.2	Compliant (minor shortcomings)
	3.3 – System performance standards	3.3.1	Compliant
		3.3.2	Compliant
		3.3.3	Compliant
4 Organisational systems management	4.1 – Asset management system	4.1.2	Compliant
	4.2 – Environmental management system	4.2.1	Compliant
		4.2.2	Compliant
	4.3 – Quality management system	4.3.1	Compliant (minor shortcomings)
4.3.2		Compliant	
5 Customer and stakeholder relations	5.7 – Provision of information to customers and the general public	5.7.1	Non-compliant (non-material)
6 Performance monitoring and reporting	6.2 – Reporting manual	6.2.1	Non-compliant (non-material)
		6.2.2	Compliant

Operational audit 2020-21 recommendations and risks of non-compliance

Sub-clause	Risk of non-compliance	Recommendations
1 Licence context and authorisation		
1.5 Obligations to make services available	N/A	No recommendations were made for this clause
1.8 Pricing	N/A	No recommendations were made for this clause
3 Supply services and performance standards		
3.1.1 Drinking water Maintain DWQMS	<p>Not having current and fit for purpose water supply agreements in place can create uncertainties in future water provision.</p> <p>Not having a clear direction on which incident levels require a root cause analysis or a requirement to update documentation, creates a risk for incident management improvement.</p> <p>Not having a clear evidence base for critical limits creates uncertainty in understanding validity of the limits.</p>	<p>Recommendation 2021/3.1.1-1: By 31 March 2023, undertake a review and revision of both the MidCoast Council and the Central Coast Council water supply agreements, with particular attention to quality, quantity, maintenance, operations and ownership aspects.</p> <p>Recommendation 2021/3.1.1-2: At the next Corporate Incident and Emergency Management Plan review, review incident level categories and make clear which ones require a root cause analysis / incident investigation.</p> <p>Recommendation 3.1.1-3: By 30 June 2022, communicate finalisation of the health complaints guideline (TRIM Reference: HW2010-95 2 12.010) to NSW Health.</p> <p>Recommendation 3.1.1-4: By 1 November 2022, improve documentation of the evidence base for CCP limits (e.g. through annotations in the CCP limits table).</p>
3.1.2 Drinking water Implement DWQMS	<p>Centralisation of emergency contacts is essential to avoid uncertainty in communication.</p> <p>Not capturing risk treatments according to the stated process creates uncertainty in risk improvements.</p> <p>Not having clear documentation of CCP limits can create uncertainty in CCP implementation.</p> <p>Not having clear training or reporting creates uncertainty in risk understanding and risk management implementation.</p>	<p>Recommendation 2021/3.1.2-1: By 30 June 2022, include MidCoast Council and Central Coast Council in the Key Emergency Services and Stakeholder Contact List Corporate Emergency Plan p42, (PA-DW-003-HW2007-900 27 19.003 Corporate Emergency Management Plan June 2021.docx).</p> <p>Recommendation 2021/3.1.2-2: At the next risk review, ensure that the risk assessments capture a corresponding risk treatment for medium controlled risks and above, within the risk register itself.</p> <p>Recommendation 2021/3.1.2-3: By 1 November 2022, review CCP Limit Tables and ensure that the limits and the logic are accurate and match SCADA.</p> <p>Recommendation 2021/3.1.2-4: By 1 November 2022, update the network chlorinators CCP information to include the currency information, according to the stated process.</p> <p>Recommendation 2021/3.1.2-5: By 30 June 2022, ensure that operators are trained to complete all components of the site checklists (noting that the calibration component was missing from two of the samples viewed at the Lemon Tree Passage site visit, 3 November 2021).</p> <p>Recommendation 2021/3.1.2-6: By 30 September 2022, strengthen existing reporting lines to the water quality committee to include comparison of the network verification sampling completed and scheduled.</p>
3.2.1 Recycled water Maintain RWQMS	<p>If briefing papers, system and data analysis are not prepared consistently to a standard procedure, then the risk assessments may not assess all hazards.</p> <p>End users may not be aware how to obtain recycled water</p>	<p>Recommendation 2021/3.2.1-1: By 31 March 2022, update Table 2.1 of the Corporate RWQMP to include residential use as an intended use for recycled water from the Morpeth and Farley WWTWs.</p> <p>Recommendation 2021/3.2.1-2: By 30 June 2022, document the process for providing annual reports on recycled water to end users and clearly communicate this process with each end user.</p>

Sub-clause	Risk of non-compliance	Recommendations
	quality data and therefore not consider appropriate use that may manifest in public health or environmental impact.	Recommendation 2021/3.2.1-3. By 31 March 2022, update the Corporate RWQMP to reflect changes to the process for scheduling internal audits of RWQMPs including how the scope of the audits is determined and how the audit recommendations are actioned and tracked.
3.2.2 Recycled water Implement RWQMS	The basis for selecting log reduction values must be documented to ensure they can be updated with the latest research and development.	<p>Recommendation 2021/3.2.2-1: By 31 March 2022, ensure that all recycled water customer agreements are not past their expiry date and develop procedures to ensure the agreements are extended or renewed before the expiry date.</p> <p>Recommendation 2021/3.2.2-2: By 31 March 2022, update the process flow diagram for Kurri Kurri WWTW to reflect the current number of clarifiers and chemical dosing.</p> <p>Recommendation 2021/3.2.2-3. By 31 March 2022, review, with Veolia, the need for testing of every delivery of aluminium sulphate at wastewater treatment works and update the work instruction for delivery and testing to reflect the outcome of this review.</p> <p>Recommendation 2021/3.2.2-4. By 30 June 2022, include the basis for the 4 log reduction in helminths in the membrane bioreactor at Dungog WWTW and update the Validation Testing Program for Water Recycling Schemes to include the log reductions for the upgraded Dungog WWTW. Hunter Water must also develop a process to ensure changes to log reduction values are reviewed and incorporated into the Validation Testing Program for Water Recycling Schemes.</p> <p>Recommendation 2021/3.2.2-5, By 31 March 2022, update the Disinfected Effluent UVT limit to reflect the CCP limit in the spreadsheet used to present long term trends of Kurri Kurri recycled water quality and check all other recycled water trend spreadsheets for discrepancies in the limits.</p>
3.3 System performance standards	N/A	No recommendations were made for this clause
4 Organisational systems management		
4.1 Asset management system	N/A	No recommendations were made for this clause
4.2 Environmental management system	N/A	No recommendations were made for this clause
4.3.1 Quality management system	Failures in document control could result in staff following superseded processes resulting in inefficiency or sub-standard product or service	Recommendation 2021/4.3.1: By 31 October 2022, Hunter Water should develop a plan for, and report on implementation progress of the proposed Integrated Management System document control opportunities for improvement (p26, IMS Management Review Meeting 26/04/21).
5 Customer and stakeholder relations		
5.7 Provision of information to customers and the general public	Excluding information on actions for non-payment may not make the customer aware of the consequences	Recommendation 2021/5.7.1-1: By 30 September 2022, a brief explanation of actions for non-payment should be included in a pamphlet that is distributed with bills at least annually.
6 Performance monitoring and reporting		
6.2 Reporting manual	Failure to inform IPART on changes in Drinking Water and Recycled Water Quality Systems could result in IPART making decisions	Recommendation 2021/6.2.1: By 30 September 2022, a process should be set up to ensure that IPART, as well as NSW Health, are advised of any changes to Drinking Water and Recycled Water Quality Systems

Sub-clause	Risk of non-compliance	Recommendations
	<p>based on out-of-date information.</p> <p>Failure to update the Reporting and Monitoring Protocol may lead to erroneous data outputs.</p>	<p>Recommendation 2021/6.2-2: By 30 September 2022, review and update the Corporate Standard – Reporting and Monitoring Protocol, following completion of the BOM review of NPR reporting in late February 2022.</p>

Operational audit 2020-21 opportunities for improvement

Sub-clause	Opportunities for improvement
1 Licence context and authorisation	
1.5 Obligations to make services available	No opportunities for improvement identified
1.8 Pricing	OFI 2021/1.8.1-1 Document a procedure for implementing drought pricing.
3 Supply services and performance standards	
3.1.1 Drinking water Maintain DWQMS	<p>OFI 2021/3.1.1-1: Address noted document history and typographical errors and disconnect between procedure and register (Procedure HW2012-441 has a disconnect between the required information for recording document version and the footer information (Footer: Version 5 11/22/2019 vs Doc History Table: Version 5, November 2021)).</p> <p>OFI 2021/3.1.1-2: At the next revision of Standard-STS-408-Water-Quality-Acceptance-Testing (HW2009-2368/2/43.001 Version 2 12/5/2019), consider adding in a specific requirement to meet the standard AS/NZS 4020 for materials used in contact with drinking water.</p> <p>OFI 2021/3.1.1-3: Consider adding the review cycle on the flow diagrams to allow currency to be confirmed.</p> <p>OFI 2021/3.1.1-4: Consider adding a requirement to collect a sample for <i>Naegleria</i> analysis if a distribution reservoir integrity breach is detected.</p> <p>OFI 2021/3.1.1-5: Consider the usefulness of collecting a sample for <i>Naegleria</i> analysis during flow reversal events in the Central Coast Pipeline connection (to determine whether these events increase <i>Naegleria</i> proliferation risk (e.g. through biofilm /sediment re-suspension and chlorine demand risk).</p> <p>OFI 2021/3.1.1-6: At the next Corporate Incident and Emergency Management Plan review, update the emergency management documentation and the drinking water management system documents, to include an explicit requirement to update procedures / protocols following an incident and/or scenario training exercise.</p> <p>OFI 2021/3.1.1-7: Consider review of Practice Note PN 201 Water Quality Incident Procedure – Notification considering it is last dated 2013.</p> <p>OFI 2021/3.1.1-8: It may be useful to specifically state that mentoring is undertaken (but this is not essential).</p> <p>OFI 2021/3.1.1-9: Consider incorporating a requirement in the next contract for the treatment operations contractor to produce an annual report to Hunter Water on all relevant aspects of drinking water quality management.</p> <p>OFI 2021/3.1.1-10: Although HW2015-1303 6.002 Catchment to Tap Water Quality Risk Assessment Guideline currently details the process for the evaluation, documentation and reporting of long-term water quality data, consider formally documenting the responsibility for this process.</p>
3.1.2 Drinking water Implement DWQMS	<p>OFI 2021/3.1.2-1: Consider formalising the position of the flow diagram authorising party and not just documentation of the name of the authorising party.</p> <p>OFI 2021/3.1.2-2: Consider improving the improvement record process through documentation of closure of the risk loop e.g. by adding another column to the improvement plan to track outcomes of the risk mitigation.</p> <p>OFI 2021/3.1.2-3: Given the current operating environment (COVID), consider scheduling calibration checks to provide a buffer for contingency of availability of technicians.</p>

Sub-clause	Opportunities for improvement
	OFI 2021/3.1.2-4: To improve governance for document changes post an incident, consider adding a reason for the change e.g. clearly showing the incident number or other in the document history or meta data.
3.2.1 Recycled water Maintain RWQMS	<p>OFI 2021/3.2.1-1. Develop a schedule to regularly review the validation testing based on the risk of changes to log reduction values over time such as from equipment age or increased hydraulic or organic loading.</p> <p>OFI 2021/3.2.1-2. Update the Corporate RWQMP to reference Recycled Water – Water Quality Data Analysis Methodology, for Recycled Water Quality Risk Assessments (HW2008-1595.067) under Element 2.</p> <p>OFI 2021/3.2.1-3. Develop a procedure for undertaking recycled risk assessment briefing papers including intended and unintended uses, system analysis, water quality assessment, hazard identification and risk assessment. Reference this procedure in the Corporate RWQMP.</p>
3.2.2 Recycled water Implement RWQMS	<p>OFI 2021/3.2.2-1: Clearly label the CCPs at all recycled water schemes including instruments and sampling points used to monitor the CCP.</p> <p>OFI 2021/3.2.2-2: Update the chemical dosing on the process flow diagram in the Plant Operating Manual – Kurri Kuri WWTW to reflect the current dosing points.</p>
3.3.1 System performance standards Water Pressure Standard	OFI 2021/3.3.1-1 A documented procedure for confirming low water pressure on site should be developed. Hunter Water have confirmed that this action is being implemented
3.3.2 System performance standards Water Continuity Standard	OFI 2021/3.3.2-1 Detailed investigations into unplanned water interruptions are listed in the Discontinuity Register. This title may be confusing and it is suggested that the spreadsheet is termed the Discontinuity Investigation Register which may be a more appropriate title.
3.3.3 System performance standards Wastewater Overflow Standard	OFI 3.3.3-1 Monitor and report on whether actions taken to reduce dry weather overflow events at 11 Dernia Rd, Shortland have been effective.
4 Organisational systems management	
4.1 Asset management system	<p>OFI 2021/4.1.2-1: It is considered that that a stronger alignment could be shown between the asset management objectives in the SAMP and the four strategic priorities in the Business Plan.</p> <p>OFI 2021/4.1.2-2: The periodic review of the SAMP could be programmed to be undertaken shortly after the issue of the next update of the Business Plan to ensure continued alignment</p> <p>OFI 2021/4.1.2-3: Consideration could be given in the next update of the Business Plan to highlight the business as usual functions such as sustaining the service into the long term</p> <p>OFI 2021/4.1.2-4: Asset management objectives, and their order, should be consistently presented across documents.</p> <p>OFI 2021/4.1.2-5: It would be desirable to capture all stakeholders and requirements from the asset management system in one location which could be cross referenced in the SAMP and asset class plans</p> <p>OFI 2021/4.1.2-6: The Asset Class Plans could be improved through clearly showing how each Plan contributes to the achievement of the asset management objectives. It is noted that the Asset Management System Steering Committee is aware of the need to improve alignment across documents.</p> <p>OFI 2021/4.1.2-7. Update the reservoir inspection training material, work instructions and checklist to indicate that remedial action should be undertaken as soon as possible on any sized hole or gap identified in a reservoir roof</p> <p>OFI 2021/4.1.2-8: Once reliable condition information is available it would be beneficial to undertake long term financial modelling to assess the likely customer charge/ service level</p>

Sub-clause	Opportunities for improvement
	impacts based on various asset renewals and climate change scenarios. This information would provide a long-term context for future pricing submissions.
4.2 Environmental management system	OFI 2021/ 4.2.1-1: Provide link to Plan – EP0013 Structure and Responsibility (HW2012-738/1.002) from the IMS section on Roles and Responsibilities
4.3.1 Quality management system	No opportunities for improvement identified
5 Customer and stakeholder relations	
5.7 Provision of information to customers and the general public	No opportunities for improvement identified
6 Performance monitoring and reporting	
6.2 Reporting manual	OFI 2021/6.2.1-1 Consideration should be given to documenting the procedure for preparing the Compliance and Performance Report.

Acronyms and abbreviations

Acronym/abbreviation	Description
2LOD	Second Line of Defence
ACF	Asset Creation Framework
ADWG	Australian Drinking Water Guidelines (2011)
AGWR	Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 1) (2006)
ALS	Australian Laboratory Services
AMCV	Asset Management Customer value
AMS	Asset Management System
AOMS	Asset Operation and Maintenance System
ARC	Audit and Risk Committee
AS	Australian Standard
AS ISO 55001:2014	Asset management – Management systems - Requirements
AS/NZS ISO 9001:2016	Quality management systems - Requirements
AS/NZS ISO 14001:2015	Environmental management systems – Requirements with guidance for use
BOM	Bureau of Meteorology
CCAG	Customer and Community Advisory Group
CCP	Critical Control Point
CWT	Clearwater Tank
DBYD	Dial Before You Dig
DWQIP	Drinking Water Quality Improvement Plan
DWQMP	Drinking Water Quality Management Plan
DWQMS	Drinking Water Quality Management System
DWQMSM	Drinking Water Quality Management System Manual
ELSA	Employee Learning System Application
EMS	Environmental Management System
EMT	Executive Management Team
EPA	Environment Protection Authority
GFMAM	Global Forum on Maintenance and Asset Management
GIS	Geographical Information System
HACCP	Hazard and Critical Control Point
IMS	Integrated Management System
IPART	Independent Pricing and Regulatory Tribunal of NSW
ISO	International Organization for Standardization
JOG	Joint Operational Group
KPI	Key Performance Indicator
LRV	Log ₁₀ Reduction Value
MOU	Memorandum of understanding
NATA	National Association of Testing Authorities

Acronym/abbreviation	Description
NPR	National Performance Reporting
NSW	New South Wales
NSW Health	NSW Ministry of Health
NWI	National Water Initiative
OPI	Opportunity for Improvement
PDP	Project Development Plan
RCA	Root Cause Analysis
Reservoir	Hunter Water's SharePoint System
RWQMP	Recycled Water Quality Management Plan
SAMP	Strategic Asset Management Plan
SCADA	Supervisory Control and Data Acquisition
SQL	Structured Query Language
TAFE	Technical and Further Education NSW
UVT	Ultraviolet Transmission
UX	User experience
VAMS	Veolia Asset Management System
VWO	Veolia Water Operations
WQMS	Water quality management system
WSAA	Water Services Association of Australia
WTP	Water Treatment Plant
WWTW	Wastewater Treatment Plant

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1 Introduction

1.1 Objectives

The objective of this engagement was to conduct an audit of Hunter Water performance against the terms and conditions (as defined in the audit scope) of its operating licence and any other Ministerially-imposed requirements for the period from 1 November 2020 to 30 October 2021, including:

- > Hunter Water Operating Licence 2017-2022
- > Hunter Water Reporting Manual – Operating Licence 2017-2022
- > IPART’s Audit Guideline Public Water Utilities (July 2019)
- > IPART’s Hunter Water Operational Audit 2020 - Report to the Minister.

The audit team also audited existing recommendations outstanding from previous audits and expressed an opinion on progress to meeting or closing-out these recommendations.

1.2 Audit method

1.2.1 Audit scope

The scope of the audit was:

- > The operational licence clauses listed in Table 1-1. These clauses have been selected by IPART on a risk basis.
- > Recommendation 2019-06 Pricing clause 1.8.1
- > Recommendation 2020-01: Drinking water clause 3.1.2
- > Recommendation 2020-02: Recycled water clause 3.2.1
- > Recommendation 2020-03: Recycled water clause 3.2.2
- > Recommendation 2020-04: Recycled water clause 3.2.2
- > Recommendation 2020-05: Recycled water clause 3.2.2
- > Recommendation 2013-14-03, 2013-14-04, 2013-14-06 and 2013-14-13: Recycled water clause 3.2.1 and clause 3.2.2

The audit covers the period from 1 November 2020 to 31 October 2021.

Table 1-1 Licence sections within the 2020-21 audit scope

Section	Clause	Sub clause
1 Licence context and authorisation	1.5 – Obligations to make services available	1.5.1
		1.5.2
	1.8 – Pricing	1.8.1
3 Supply services and performance standards	3.1 – Drinking water	3.1.1
		3.1.2
	3.2 – Recycled water	3.2.1
		3.2.2
		3.3 – System performance standards
		3.3.2
		3.3.3
4 Organisational systems management	4.1 – Asset management system	4.1.2
	4.2 – Environmental management system	4.2.1
		4.2.2

Section	Clause	Sub clause
	4.3 – Quality management system	4.3.1
		4.3.2
5 Customer and stakeholder relations	5.7 – Provision of information to customers and the general public	5.7.1
6 Performance monitoring and reporting	6.2 – Reporting manual	6.2.1
		6.2.2

1.2.2 Audit standard

In conducting the audit, the auditors are following IPART’s Audit Guideline Public Water Utilities (July 2019).

Regard was also given to the following standards and codes, especially where these provided specific detail that is appropriate to the audit:

- > ASAE 3100 (2017) Compliance Engagements issued by the Auditing and Assurance Standards Board
- > ISO 19011:2018 Guidelines for auditing management systems
- > AS/NZS ISO 9001:2016: Quality management systems – Requirements
- > ISO 17021:2015 Conformity Assessment – Requirements for bodies providing audit and certification of management systems (contains principles and requirements for the competence, consistency and impartiality of the audit and certification of management systems of all types)
- > ISO 31000:2108 Risk management.

1.2.3 Audit steps

The audit process was conducted as described in IPART’s Audit Guideline Public Water Utilities (July 2019).

1.2.4 Audit team

The audit team and audit qualifications are provided in Table 1-2.

Table 1-2 Audit team members and their qualifications

Team member	Details
Aneurin Hughes Cardno Lead Auditor	Mr Aneurin Hughes (BSc (Hons), Grad Dip Bus, MIEAust, RPEQ) holds the following auditor qualifications: World Partners in Asset Management Certified Asset Management Assessor No. 57 (www.wpiam.com). This accreditation demonstrates compliance with ISO 17021-5 Competence requirements for auditing and certification of asset management system. A registered Exemplar Global lead auditor <ul style="list-style-type: none"> ▪ Exemplar Global TL-AU (Lead Auditor) (No. 201103859); ▪ Exemplar Global -DW (Drinking Water) (No. 638036)
Annette Davison Risk Edge Pty Ltd Auditor	Dr Annette Davison (BSc(Hons); MEnvLGovLaw; PhD; GAICD, PMAWA) holds the following auditor qualifications: <ul style="list-style-type: none"> ▪ Moderating Auditor, registered by the Water Services Association of Australia (WSAA) with skills to use the WSAA ‘Aquality’ benchmarking tool A registered Exemplar Global lead auditor or competency in one or more of the following specialisations: <ul style="list-style-type: none"> ▪ RABQSA-DW (Drinking Water) (Certificate No. 023268) ▪ Certified ISO 22000 competency from NCSI (Food Safety Management Systems) ▪ RABQSA-TL (Leading Management Systems Audit Teams) (Certificate No. ENR-00193500)
David Bartley Atom Consulting Auditor	David Bartley (B E (Chem), Dip Man) holds the following auditor qualifications: 1. A registered Exemplar Global lead auditor (Certificate No. 206802): <ol style="list-style-type: none"> a. Exemplar Global -DW (Drinking Water) b. Exemplar Global -RW (Recycled Water)

Team member	Details
	c. Exemplar Global TL-AU (Lead Auditor)
Ella Hingston Cardno Assistant Auditor/ Quality Assurance	Ella Hingston is an Asset Management Engineer and holds the following qualifications: <ul style="list-style-type: none"> BE (Hons)
Daniel Rawsthorne Cardno Field verification	Daniel Rawsthorne is a Senior Asset Management Engineer and holds the following qualifications: <ul style="list-style-type: none"> BEng (Hons) BEng Commerce

1.2.5 Audit grades

The audit grade definitions used in assessing the auditee's performance against the requirements are set out in Table 1-3.

Table 1-3 Audit grades

Audit finding	Description
Compliant	Sufficient evidence is available to confirm that the requirements have been met.
Compliant (minor shortcomings)	Sufficient evidence is available to confirm that the requirements have been met apart from minor shortcomings which to date have not compromised the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes
Non-compliant (non-material)	Sufficient evidence is not available to confirm that the requirements have been met and the deficiency does not adversely impact the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes
Non-compliant (material)	Sufficient evidence is not available to confirm the requirements have been met and the deficiency does adversely impact the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.
No requirement	There is no requirement for the utility to meet this criterion within the audit period

Source: Audit Guideline Public Water Utilities (July 2019).

1.3 Regulatory regime

Hunter Water operates largely in a NSW context but must also have regard to matters outside of that jurisdiction, where those matters may affect how it does business. A summary of the key legal and regulatory instruments for Hunter Water is provided in Table 1-4. It should be noted that this listing is intended to be illustrative, not exhaustive, for the purposes of this report.

Table 1-4 Key legal and formal instruments relevant to Hunter Water operating licence¹

Instrument	Relevance
<i>Competition and Consumer Act 2010 (Cth)</i>	An Act for the promotion of competition and fair trading and provision for consumer protection. Could apply to the 'fitness for purpose' of any product or service supplied.
<i>Current version of the Australian Drinking Water Guidelines</i>	These guidelines are called up under Hunter Water Operating Licence obligations.
<i>Current version of the Australian Guidelines for Water Recycling</i>	These guidelines are called up under Hunter Water Operating Licence obligations.
<i>Government Information (Public Access) Act 2009 (NSW)</i>	Information may be requested from Hunter Water, which relates to aspects of the licence.

¹ Where legislation is identified in this table, a reference to that legislation should be taken to include any Regulation/s made pursuant to it.

Instrument	Relevance
<i>Hunter Water Act 1991 (NSW) No53</i>	An Act which establishes Hunter Water, defining the functions and objectives of Hunter Water.
<i>Hunter Water Operating Licence 2017-2022</i>	A licence issued by the Governor under Part 5 of the Hunter Water Act 1991 which enables Hunter Water to provide relevant services within its area of operations. This licence also gives effect to the operational audits (this audit) to which Hunter Water is subject.
<i>Independent Pricing and Regulatory Tribunal Act 1992 (NSW)</i>	Allows for the regulation of utilities such as Hunter Water including the administration and auditing of licences and pricing functions.
<i>Memorandum of Understanding with NSW Health</i>	Sets out the working relationship between NSW Health and Hunter Water.
<i>Memorandum of Understanding with Environment Protection Authority</i>	Sets out the working relationship between Environment Protection Authority and Hunter Water.
<i>Public Health Act 2010 (NSW)</i>	The objectives of this Act are to protect and promote public health, control risks to public health, promote the control and prevent the spread of infectious diseases and recognise the role of local governments in protecting public health. Supporting Regulations are intended to support the smooth operation of the Act. Hunter Water has obligations under this Act including notifying the Minister of any situation that is likely to be a risk to public health.

1.4 Quality assurance process

Our quality assurance approach to this audit involved peer review from a qualified auditor who was not part of the interview team. This process commenced at the development and submission of the audit questionnaires. Checks of information received were conducted and included aspects such as dates for audit scope compliance, veracity of information, coverage of the subject area being audited and depth of implementation. Professional scepticism (as per ASAE 3100) was applied as part of the document review and on-site audit. Auditors liaised frequently with each other. Support auditors were used for clauses where the audit load was heavy.

Throughout the audit report writing process, the documentation was proofread and cross-checked by the audit team members. An overall quality assurance review was conducted by the audit team leader and a peer review undertaken by a qualified auditor who was not part of the interview team.

2 Site visit report

2.1 Kurri Kurri Wastewater Treatment Works

A site visit to Kurri Kurri Wastewater Treatment Works (WWTW) was undertaken on the morning of 3/11/2021. The Kurri Kurri WWTW is a Modified Lutzack-Ettinger process with tertiary filtration and UV disinfection. Ferric chloride and aluminium sulphate are dosed for phosphorus removal.

Veolia Water Operations (VWO) staff provided a walk through the plant to confirm the process flow diagrams, including location of chemical dosing points and monitoring points. The staff were able to demonstrate an understanding of the treatment process from inlet to supply to recycled water customers. Staff were also able to explain preventative measures including critical control points (CCPs) used to ensure recycled water is safe for the intended use.

Staff were also able to demonstrate how chemicals are ordered and received to ensure correct chemicals are delivered to the correct location.

Staff were able to access SCADA and demonstrate when the inlet flow exceeded the CCP limit between 14/3/2021 and 7/4/2021, the alarm was activated and the pumps supplying recycled water to Kurri Kurri TAFE did not operate. Staff were also able to describe protocols for contacting Kurri Kurri Golf Course during CCP exceedances or other recycled water quality issues.

Staff were able to access the Hunter Water/Veolia Portal and could access operation and maintenance manuals and other procedures from the site.

A tour of the laboratory was also undertaken and calibration stickers were observed on handheld and benchtop instruments and the current Laboratory analysis log sheet was on the bench completed to the current day.

A number of key issues were discussed and summarised below:

The service of laboratory instruments was due in September 2021. VWO staff explained that the process for servicing of all instruments used on the Hunter Water sites is to deliver them all to a central location and a technician travels from Sydney to undertake the service in one day. Due to COVID travel restrictions this was not able to occur. Staff advised that the service is planned for later in November.

Minor errors were found in the process flow diagrams in the Kurri Kurri Recycled Water Quality Management Plan (RWQMP) and the Kurri Kurri WWTW Plant Operating Manual.

The CCP monitoring points were not clearly labelled in the field.

All CCP limits and delays matched the tables in the Kurri Kurri RWQMP. Staff were not able to change the CCP setpoints on SCADA. Staff were able to change the CCP alarm delay setpoints however a review of the event history on these delays showed they had not been changed during the audit period.

The Recycled Water Quality Policy located inside the main entrance to the administration building was dated 10 November 2020 which is the same version provided as evidence and on Hunter Water's website. An older version of the policy was found in the lunch room and this was removed and disposed of during the site visit.

An inspection was undertaken of the process units and discussions were held with Veolia and Hunter Water staff on asset management practices. The process units appeared to be well maintained. Clear demarcation existed between operational and project construction areas. Appropriate labelling and asset identification were evident.

Evidence was observed during the inspections of planned maintenance compliance inspections on:

- > Safety shower inspection yearly tag in place and completed weekly inspection documented in operational check sheets
- > Crane inspections by external specialist evident by tags.

Asset management practices were discussed with operational staff and they were able to demonstrate a thorough understanding of requirements of the maintenance work orders and frequency of tasks pertaining to their work areas. Operational personnel at this plant had a technical appreciation of the maintenance tasks and could articulate an example of continuous improvement with the implementation of planned pump inspections as the result of a pump wear issue. Operational personnel understood the functions and role responsibilities for maintaining, planning and scheduling, and performance tracking. A completed corrective

maintenance work order resolving an issue identified from a previous planned inspection maintenance work order was observed, and provided an example of how the maintenance work cycle had been utilised effectively to maintain the plant.

Operational and management staff understood the effect of asset performance on providing the required levels of service. An Asset Deficiency Register was used to assess asset improvements and major replacement that could not be considered within the typical scope of operational or maintenance work.

A daily check sheet was utilised by operators to perform routine daily and weekly inspections and was being completed in full. It was observed that the formatting of the form did not allow all text to be visible. This may be a source of error in future inspections or with unfamiliar employees and should be corrected.

2.2 Lemon Tree Passage Water Treatment Plant

A site visit of Lemon Tree Passage was undertaken on 3/11/2021. The site visit satisfied one of NSW Health's requirements to review how turbidity was managed from plants receiving water from ground water sources as well as review CCP management.

Test sheets were used to help direct the site visit in a number of areas including:

- > Ensure that the policy is visible and is communicated, understood and implemented by employees and contractors.
- > Construct a flow diagram of the water system from the source to the endpoint.
- > Document all procedures and compile into an operations manual.
- > Establish and document procedures for corrective action where operational parameters are not met.
- > Train employees and regularly test emergency response plans.
- > Ensuring that only approved materials and chemicals are used.
- > Establish documented procedures for evaluating chemicals, materials and suppliers.
- > Assess preventive measures through the water system to identify critical control points.
- > Establish mechanisms for operational control.
- > Document the critical control points, critical limits and target criteria (including consistency with SCADA).
- > Periodically review documentation and revise as necessary.

Similar issues relating to calibration, as noted in Section 2.2, were observed.

A non-conformance was identified for the CCP table including a disconnect between the table and SCADA limits. Apart from the CCP observation, no other significant issues were noted during the site visit.

Debris was noted on the clear water tank roof, an observation made in a previous internal audit (2021).

The site itself was well-maintained, tidy and the staff were courteous and knew their subject matter and role responsibilities.

2.3 Abermain Reservoir and Trunk Valve

An inspection of the tank, access stairs, roof and trunk valve assets at the Abermain Reservoir was conducted on 3/11/21 and discussions held with Hunter Water staff. The assets were in good condition with the exception of nominal graffiti. A minor hole (approximately 2cm diameter) in the roof ridge capping was observed which may be a source of contaminated stormwater ingress. Hunter Water have subsequently provided evidence (SE-076 a and b) that this hole has been repaired. Work processes for the identification of roof holes were discussed including the review of work order instructions and inspection training.

Whilst reference was made in work instructions to identifying roof holes a criteria and priority to initiate corrective action was not specified. The inspection instructions and training should be revised with appropriate criteria to reduce the risk of any water contamination.

The issue of reservoir inspections is discussed further under Clause 4.1.2 Asst Management System.

An inspection was undertaken of the trunk valve and chamber. These assets were found to be in a good condition. The assets were relatively new with the valve installed in 2007 and the actuator replaced in 2015.

Hunter Water staff demonstrated a high level of appreciation of asset management practices. They understood the requirements to manage an asset over the full life cycle and had implemented asset management awareness training. The maintainers had access to a mobile work order application to perform inspections on site and access to GIS spatial data to identify correct valves for inspection and isolation. The mobile application allowed live data to be utilised for maintenance work management and performance tracking.

We were subsequently provided with information on valve inspection schedules and checklist.

3 Audit of individual clauses

Clause 1.5 - Obligations to make services available

Clause 1.5.1

Table 3-1 Clause 1.5.1 compliance grade

Subclause	Requirement	Compliance grade
1.5.1	<p>Subject to Hunter Water continuing to comply with any applicable law, Hunter Water must provide the Services on request to any Property situated in the Area of Operations which is connected to or, for which a connection is available to:</p> <p>a) in the case of supplying water, the Water Supply System; and</p> <p>b) in the case of providing sewerage services and/or disposing of Wastewater, the Sewerage System.</p>	Compliant
Risk	<p>Failure to comply with this obligation means that customers would not have access to water and sewerage services which in turn might have economic, public health and environmental impacts. Compliance with this clause also allows Hunter Water to impose conditions to ensure safe, reliable and financially viable services.</p>	<p>Target for full compliance</p> <p>Evidence that Hunter Water has appropriate processes and systems in place to enable customers to request connection, test that the connection is in the Area of Operations and consistent with the conditions imposed by Hunter Water and then to enable the connection to be made.</p>

Summary of reasons for grade

Hunter Water demonstrated that it has in place appropriate information systems and processes to help to ensure that water supply and sewerage/wastewater disposal services are available on request for connection to any property situated in the area of operations which is connected to or, for which a connection is available to, the water supply system and sewerage system respectively.

This clause is graded Compliant.

Discussion and notes

This clause requires that Hunter Water provide water supply and sewerage/wastewater disposal services on request for connection to any property situated in the area of operations which is connected to or, for which a connection is available to, the water supply system and sewerage system respectively.

Customers apply for water and sewerage/wastewater connections via Hunter Water's online Developer Self-Service Portal. This application process enables the customer to seek Hunter Water's requirements for accessing its water supply and sewerage/wastewater disposal services.

In submitting their application, the portal allows customers to select an application type (e.g., build plan stamping, development assessment or preliminary servicing application) and enter the applicant details, development address, development category and payment details. If the customer has previously registered for the portal, the applicant details are pre-populated based on their registration information. The customer can also upload required documents (e.g., subdivision plans) as part of the application process. The minimum required documentation, corresponding to the selected application type, is specified within the portal. Draft, submitted and assessed applications can be viewed by the customer through the portal. At audit, we sighted the submission of a test application, including the payment confirmation screen and evidence that the application was categorised with a status of "application under assessment" once submitted.

Once the application is submitted by the customer, it is subjected to two stages of assessment by Hunter Water. The first stage of assessment is a validation and quality assurance check performed by the customer service team. As part of this stage, the lot, Deposited Plan (DP) number and address of the property are validated against Hunter Water's billing system, Velocity, to determine if the property is inside Hunter Water's area of operations. If the property is found to be outside the area of operations, an error message of

“Unmatched” is returned. In this scenario, the property is then manually confirmed by a staff member to be outside the area of operations. If the property is confirmed to be outside the area of operations, the application fee is refunded to the customer. Hunter Water has published its area of operations on its website and has delineated the area of operations within its geographical information system (GIS). As evidence, Hunter Water provided to us a screenshot from GIS showing the area of operations (1.5.1-E-005 - Attachment 3 - Hunter Water Area of Operation GIS Demonstration.docx).

If the property is found to be within the area of operations, the owner’s name is validated against Velocity. The customer service team proceeds to manually validate that the correct documents have been provided as part of the application, confirm the automatically generated description of works (e.g., “Development of granny flat on Lot x”), create an overlay, select the applicable assessment category, and upload the application files to Hunter Water’s records management system (TRIM). Application files can either be uploaded as new files to TRIM or uploaded as revisions of existing files in TRIM. Once the application is processed, an automated notification e-mail is sent to the customer’s e-mail address. Requests for additional information, if required, are also sent to the customer’s e-mail address. At audit, we sighted evidence that the test application successfully appeared in the back-end environment of the portal and that a notification e-mail was received by the test customer.

The second stage of assessment is an assessment by the application assessment team. The application assessment team performs tasks such as reviewing the information provided, confirming the automatically calculated equivalent tenancies and determining the asset impact. The overall procedure for assessing applications is detailed in the *How to process a DA job in the Workflow Hub* work instruction (TRIM: IT2019-10/3/4.005). We note that this work instruction contains highlighted text stating, “Screenshots correct up to this point – Section 50 needs to be changed”. We also note that the work instruction does not contain document control information beyond a document number. We recommend (recommendation 2021/4.3.1-1) that the work instruction is reviewed and finalised, including the addition of document control information. We discuss document control further against clause 4.3.

Although Hunter Water has developed a work instruction for the overall application assessment process, it does not have in place a specific guide for determining asset impacts. Hunter Water advised that each application is instead assessed on a case-by-case basis, with new starters undertaking a variety of training (internal one-on-one training, Hunter H2O online training and a Water Services Association of Australia design course) to assist them in assessing asset impacts. Hunter Water also advised that new starters are assigned to low-risk applications, where the results of these assessments are reviewed by senior staff members prior to finalisation. Additionally, Hunter Water advised that all applications are peer reviewed internally. As evidence of the training offered, Hunter Water provided to us the *Design Assurance Training: Design of Gravity Sewerage Reticulation Systems: Navigating WSA 02-2014-3.1 Hunter Water Edition Version 2* (October 2021).

Once the application is assessed, Hunter Water advised that it sets formal requirements for the customer to access its water supply and sewerage/wastewater disposal services. These requirements are communicated through a *Notice of Requirements*. Under section 50 of the *Hunter Water Act 1991*, Hunter Water has 60 days to issue compliance certificates for its area of operations. Hunter Water advised that weekly and monthly reporting is performed to control the application assessment process and ensure that the timeframe of 60 days is not exceeded. As evidence of the reporting performed, Hunter Water provided to us its annual and monthly development assessment performance data for 2020/21 (1.5.1-E-004 - Attachment 2 - Development Assessment Performance 20-21.xlsx).

The online Developer Self-Service Portal was launched on 15 August 2021. Prior to this date, applications were received via e-mail, online, post and over the counter. The overall process for assessing applications prior to 15 August 2021 is detailed in the *Standard Operating Procedure – Review of Application for Development Services* (version 3, TRIM:HW2015-1469/15/4.001). This procedure was last revised on 22 February 2019. Hunter Water also provided to us screenshots of the workflow process implemented in TRIM prior to 15 August 2021 (1.5.1-E-003 - Attachment 1C - DA QA Screenshots Example 2020-1501 before 15 August 2021.docx). We consider that Hunter Water has in place appropriate information systems and processes for this clause.

On 7 July 2021, a stakeholder submission was received expressing concerns with the absence of sewerage services in Raworth within the Maitland City Council local government area. At audit, we queried Hunter Water about the reasons for not providing sewerage services in Raworth. Hunter Water responded that the 2018 IPART Determination “requires the beneficiaries to pay for the cost of the service, which are typically very expensive, and do not meet the [operating] licence requirements of [clause] 1.5.3 for financial viability for Hunter Water to take the lead”. Hunter Water considered the financial viability of the provision of sewerage services in Raworth by calculating the capital cost of these services (1.5.1-E-009 - Attachment 7 -

HW2010-952 16 6.001 - Raworth Backlog sewer - cost estimate.xlsx). We note that the cost allocation hierarchy set out in the 2018 IPART Determination firstly prefers that the impactor pays but, in the case of connecting customers, the impactor and the beneficiary may be the same. Payment by the beneficiary is the second preference in the 2018 IPART Determination cost allocation hierarchy. As this cost allocation principle is documented within the 2018 IPART Determination, and as Hunter Water has communicated this principle to the stakeholder along with the supporting capital cost estimate, we consider that Hunter Water has imposed and met its conditions for the provision of financially viable services.

Recommendations

No recommendations were made.

Opportunities for improvement

No opportunities for improvement were identified.

Clause 1.5.2

Table 3-2 Clause 1.5.2 compliance grade

Subclause	Requirement	Compliance grade
1.5.2	<p>Subject to Hunter Water continuing to comply with any applicable law, Hunter Water must provide the Services on request to any WIC Act Licensee for ultimate end-use within the Area of Operations, where the WIC Act Licensee is connected to, or where a connection is available in respect of that WIC Act Licenses to:</p> <p>a) in the case of supplying water, the Water Supply System; and</p> <p>b) in the case of providing sewerage services and/or disposing of Wastewater, the Sewerage System.</p>	Not Required
Risk	<p>Failure to comply with this obligation presents a risk that Hunter Water may not provide services to a WIC Act licensee, or would only provide services on unreasonable terms and conditions. This would have consequences for competition in service provision.</p>	Target for full compliance
		<p>Evidence that Hunter Water has appropriate processes and systems in place to enable WIC Act licensees to request connection, test that the connection is in the Area of Operations and consistent with the conditions imposed by Hunter Water and then to enable the connection to be made.</p>

Summary of reasons for grade

Hunter Water demonstrated that it has in place appropriate information systems and processes to help to ensure that water supply and sewerage/wastewater disposal services are available on request to any Water Industry Competition (WIC) Act Licensee for ultimate end use within the area of operations, where the WIC Act Licensee is connected to or, for which a connection is available to, the water supply system and sewerage system respectively.

This clause is graded Not Required, as this requirement was not triggered during the audit period.

Discussion and notes

This clause requires that Hunter Water provide water supply and sewerage/wastewater disposal services on request to any Water Industry Competition (WIC) Act Licensee for ultimate end use within the area of operations, where the WIC Act Licensee is connected to or, for which a connection is available to, the water supply system and sewerage system respectively.

Hunter Water advised that no applications were received from WIC Act Licensees during the audit period. However, the process to assess applications from WIC Act Licensees is similar to the process adopted for assessing applications from customers under clause 1.5.1.

IPART has published a list of all WIC Act Licensees in New South Wales on its website. Hunter Water advised that two licensees provide services within Hunter Water's area of operations – Altogether and Water Utilities Australia. Hunter Water has delineated the service area of each licensee in GIS. As evidence, Hunter Water provided to us a screenshot from GIS showing Altogether's service area in Cooranbong (*1.5.2-E-004 - Attachment 2 - GIS Excerpts PNO Area of Operation.docx*). As the process for assessing

applications from WIC Act Licensees is similar to that for customers under clause 1.5.1, we consider that Hunter Water has in place appropriate information systems and processes for this clause.

Recommendations

No recommendations were made.

Opportunities for improvement

No opportunities for improvement were identified.

Clause 1.8 – Pricing

Clause 1.8.1

Table 3-3 Clause 1.8.1 compliance grade

Subclause	Requirement	Compliance grade
1.8.1	Subject to the terms of this Licence, the Act and the IPART Act, Hunter Water must set the level of fees, charges and other amounts payable for its Services in accordance with any applicable determination or determination under the IPART Act.	Compliant
Risk	Failure to comply with the requirements of this obligation presents a risk that Hunter Water is either overcharging its customers or failing to recover the costs of providing its services.	Target for full compliance Evidence that Hunter Water has set the level of fees, charges and other amounts payable for its Services subject to the terms of the Licence, the Act and the maximum prices and methodologies determined by IPART.

Summary of reasons for grade

Hunter Water demonstrated that they have rigorous processes in place to ensure that charges are in accordance with the 2020 price determination.

This clause is graded Compliant.

Discussion and notes

Hunter Water explained that the process to ensure these prices are set in accordance with the IPART price determination can be broken into two categories. The first is the process implemented at the start of each determination period or at the start of each financial year to make any changes to the current pricing or methodologies. The process to ensure required changes are made when changes are made to the IPART price determination involve three main areas of the business. Finance, IT and Customer Services teams complete a process to ensure the required prices and methodologies are updated within Hunter Water's billing system (Velocity which was implemented in November 2020). In general terms this process involves the following steps:

- > A project (lead by Customer Services, facilitated by ICT) is initiated to determine changes required. The scoping activities of this project involve representatives from Finance, ICT and Customer Services to ensure roles and responsibilities are defined and understood.
- > Once scope has been determined, an approved pricing sheet based on the IPART price determination is supplied by the economic team (Finance) to the ICT project team.
- > These prices and methodologies are then loaded into a test version of our billing system by the vendor of the system under ICT project methodologies. A test plan is developed to ensure all changes being made are tested before changes move from the test system into a production system.
- > The test plan is executed, with amendments required made as the results of each test are known. Once the test plan is completed, a summary report is developed which is distributed to stakeholders within Customer Services to confirm the required changes have been implemented and tested. Endorsement of this summary report is required by these stakeholders before the price changes are loaded into the production version of the billing system.
- > Once this test plan is completed, the tested changes are then loaded in to the production system for use in generating customer bills.
- > A daily bill validation process is then implemented which involves billing officers checking a PDF sample of the bills for accuracy (focusing on the changes) before they are printed and distributed to customers.
- > The ICT project remains in support mode for a period of a few weeks after the changes have been made to ensure sufficient turn-around time to address any issues that may arise from this validation process:

The second category is the ongoing process to ensure the prices and methodologies in the IPART price determination are applied correctly on a cyclic basis for each customer. As a summary, this process includes

- > Internal controls within the billing system which generate a set of daily validations for billing officers to review to ensure correct charges have been applied.
- > A series of internal controls within the billing system which are used to ensure correct information is entered into the system to facilitate correct application of prices.

Hunter Water provided evidence to support the existence of the above processes. They advised that an overall process document that details the roles and responsibilities for the processes to ensure prices are changed correctly is under development.

The process was further described at the audit interview. Hunter Water subsequently the Final Determination document for Hunter Water prices (June 2020). They were able to satisfactorily answer queries on the Environmental Projects Charge (termed Discretionary Services Charge in the Determination). They were also able clearly explain and provide supporting calculations on how the sewerage services charge was calculated for a household.

The 2020 price determination included a drought price if the water storage falls below 60%. Hunter Water advised that drought pricing has not had to be implemented to date as the threshold had not been met. They advised that a procedure has not been developed for implementing drought pricing. We consider that due to the potential complexities associated with drought pricing that a procedure should be developed which would allow it to be fully reviewed and tested well ahead of any implementation (OFI 2021/1.8.1-1).

We also discussed progress on implementing Recommendation 2019-06: By 31 March 2021, Hunter Water must ensure that the proposed functionality for fully automated tankered waste billing is incorporated into the new corporate billing system.

Hunter Water explained that the historically implemented manual docket had been replaced by an online app. At the time the app was developed, there was no potential for integration with the billing system. As a result, the transfer of data from the online app into Velocity was a manual system via a bot process.

A new billing system (velocity) was implemented in November 2020. An Automated Trade Waste Billing System has been delivered over the past few months. We were advised at the audit interview that the system went live on Thursday 28 October 2021. Hunter Water subsequently confirmed that the system had gone live on 28 October through the provision of screen shots from its Help Desk Portal.

Recommendations

No recommendations were made.

Opportunities for improvement

OFI 2021/1.8.1-1 Document a procedure for implementing drought pricing.

Clause 3.1 – Drinking water

Clause 3.1.1

Table 3-4 Clause 3.1.1 compliance grade

Subclause	Requirement	Compliance grade
3.1.1	<p>Hunter Water must maintain a Management System for Drinking Water that is consistent with the Australian Drinking Water Guidelines, except to the extent that NSW Health specifies otherwise in writing (the Drinking Water Quality Management System).</p> <p>[Note: It is expected that the Drinking Water Quality Management System will be consistent with the Framework for Management of Drinking Water Quality. However, where NSW Health considers it appropriate, the application of Australian Drinking Water Guidelines may be amended or added to, to take account of Hunter Water’s circumstances and/or Drinking Water quality policy and practices within New South Wales.</p> <p>The Australian Drinking Water Guidelines has provisions relating to the prevention of use of non-potable water for potable purposes.</p>	Compliant (minor shortcomings)

Risk	Target for full compliance
Without an adequate and maintained Water Quality Management System, the risk posed to public health from non-compliance with this clause could be significant.	Systems and processes in place that meet the requirements of the Australian Drinking Water Guidelines Framework for Management of Drinking Water Quality and ensure the Water Quality Management System remains up to date.

Summary of reasons for grade

All Framework for Management of Drinking Water Quality elements, except Element 7 (Employee awareness and training, except to the extent required for review by NSW Health) and Element 8 (Community involvement and awareness), were within scope for this audit. Processes in place for both Hunter Water and the treatment operations contractor are largely consistent with the Framework for Management of Drinking Water Quality and are maintained. Many areas of noteworthy practices were identified under this clause:

- > Element 2: The flow diagram checklist is a noteworthy process (3.1-ADWG-02-E-003 - Flow Diagram Checklist for LTP WTP Flow Diagram.docx) because it is indicative of a sound understanding of the requirements of the Framework.
- > Element 2: System descriptions are considered succinct but comprehensive and provide all the required information for a sound risk assessment.
- > Element 2: Hunter Water’s scheduling of the internal audit to occur prior to the annual risk assessment review is an inspired approach and should become standard industry practice, as it provides a clear and fresh path for identified risks to be fully addressed.
- > Element 4: The Reservoir portal is considered worthy of note not just from an ease of retrieval of documentation but also in the UX (user experience) thought given to the layout.
- > Element 4: Hunter Water’s process for managing materials and approved products and manufacturers on the web portal, and the quality of the documentation, is considered noteworthy.
- > Element 5: As well as being comprehensive, the monitoring plan contains a table mapping the monitoring types in the plan, against the Framework element requirements - an approach considered noteworthy.
- > Element 5: The process of updating the monitoring program after the annual risk review is a good example of a sound water quality management governance practice.

- > Element 9: The design validation guideline is comprehensive and is a sound example of integrating water quality outcomes with fit for purpose asset creation.

Several shortcomings were noted including:

- > Element 4: Both the MidCoast Council and Central Coast Council agreements are old (19 years and 15 years respectively). This was an area of focus for NSW Health. The documents would benefit from review to ensure ongoing fitness for purpose and currency (Recommendation 2021/3.1.1-1).
- > Element 6: There is a slight disconnect over what incident levels require an investigation and root cause analysis to be undertaken. This aspect should be made explicit (Recommendation 2021/3.1.1-2).
- > Element 6: Engagement with NSW Health has been impacted in recent times because of the impost on NSW Health's time, due to a focus on COVID responses. Nevertheless, engagement over the health complaint guideline was an area of focus for NSW Health with a shortcoming noted in communication of finalisation of the same with NSW Health (Recommendation 3.1.1-3).
- > Element 6: An explicit requirement to update procedures and processes following an incident and/or training scenario, is a small shortcoming in the incident and emergency management framework (Corporate Emergency Management Plan and PRO-2803-1) (Recommendation 2021/3.1.1-2)).
- > Element 9: Documentation of the evidence base for CCP limits (Recommendation 3.1.1-4).

This clause is graded Compliant (minor shortcomings).

Discussion and notes

Element 1 Commitment to drinking water quality management

C 1.1: Drinking water quality policy (Compliant)

A Drinking Water Quality Management System Manual (DWQMSM), supported by a treatment operations contractor Drinking Water Quality Management Plan (DWQMP), is in place and current.

A drinking water policy is in place, meets the requirements of the ADWG (commitment, covers contractors as well as staff and covers catchment to consumer) and current as stated in the DWQMSM. The managing director has signed the policy, a position considered appropriate as a signatory for this type and hierarchy of document (as the position meets the 'senior executive' requirement of the Framework). A requirement for visibility of policy is covered in Table 4-1 of the DWQMSM.

C 1.2: Regulatory and formal requirements (Compliant; OFI 2021/3.1.1-1)

A process is in place for identifying and documenting the regulatory and formal requirements relevant to drinking water quality. The process is described in Table 4-2 (p19) of the DWQMS Manual. Procedure HW2012-441 has a slight disconnect between the required information for recording document version (i.e. as per document Integrated Management System Document Management TRIM: HW2013-421/22/002, "show the current revision status of the document, and a summary of the most recent changes since last version") and the footer information (Footer: Version 5 11/22/2019 vs Doc History Table: Version 5, November 2021), - otherwise, the procedure includes a requirement to consider quality, and is sound. Outputs from the process include the Legal and Other Requirements register which covers expected items. A small typographical error exists in Column A on the Quality Tab (TRIM Number instead of Number). The register has been updated to include the new version of the ADWG. It is uncertain how the review cycle identified in the procedure has been implemented in practice as there is no identification of the source of the change or whether a review was undertaken, but no change was required. A slight disconnect was noted between the tab in the register for recording changes in document history and the requirement in the procedure (Register: 'Change History' vs Procedure: 'Record of Revisions'). The document history information for 3.1-ADWG-01-E-003 - HW2013-421 9.006 Register - Legal and Other Requirements - Quality.XLSX - currently states Version: 1 Approved: Matthew Wickens 13/10/21 but seems to have had many reviews. The disconnect and the review information are considered minor as they do not impact on the ability of Hunter Water to achieve defined objectives as the register was up to date – however, document control issues are covered in Element 10 (Clause 3.1.2) to avoid double counting.

A process is in place for ensuring that all employees involved in drinking water quality management understand their role and responsibility in delivering compliant drinking water.

The DWQMS Manual (Table 4-2, p20) states that legal and formal responsibilities are written into position descriptions (PDs) which are required for all staff in water quality positions. Responsibilities for treatment operations are documented in the Treatment Operations DWQMP (Appendix A of the DWQMS - confirmed

as Appendix A of MAN-2813-3 - Responsibilities and Authorities Matrix). This part of the component is considered compliant.

C 1.3: Engaging stakeholders (Compliant)

A process is in place for determining both the identity and the role of stakeholders who could affect, or be affected by, Hunter Water's decisions or activities in relation to drinking water quality. Table 4-3 of the DWQMSM details a comprehensive approach to identification of stakeholders in terms of customers, emergency management, public affairs and other key stakeholders. The mode of communication with stakeholders is documented. Table 4-3 of the DWQMSM documents the mode of communication.

Section 15.3 of the Corporate Emergency Management Plan confirms Stakeholder Identification and Notifications and text in this document confirms a requirement for key messages and suggested frequency of communication. The service provider contact list for emergencies was sighted and is appropriate and current.

Element 2 Assessment of the drinking water supply system

C.2.1: Water supply system analysis (Compliant; OFI 2021/3.1.1-3)

The DWQMSM (Table 4-4) states how teams are assembled (for both HWC and the treatment operations contract provider) and their makeup. The team make-up and approach are considered appropriate. Information in the DWQMSM confirms the appropriateness of the team for the water supply system analysis (HWC: Figure 4 in overview: Treatment Service Provider: Section 2.2.1 of Appendix A). The risk assessment summary reports confirm the appropriateness of the team assembled for the risk assessment (including NSW Health representation). A process is in place for creating and reviewing flow diagrams.

The DWQMSM notes (Table 4-4) that a flow diagram checklist is in place to support diagram preparation and revision.

Of the five flow diagrams reviewed, all are dated and are assumed current. The 2017 diagrams are now four years old but at interview, were verbally confirmed as current (Lemon Tree Passage (Version 1 HW2015-1365/16.002) 22/06/2017; Gresford (Version 1 HW2015-1365/16.003) 22/06/2017; Lemon Tree Passage WTP (TEM-5058-3) 24/03/2021; Gresford WTP (TEM-5057-3) 24/03/2021; Distribution System (S09-13161.005) 1/6/2017)).

Currency is considered confirmed and an opportunity for improvement has been assigned.

Table 4-4 DWQMSM (p23) includes a description of the process for assembling key water supply system characteristics from source to customer. The approach is comprehensive.

The DWQMSM includes the system descriptions, and there is a process for updating this document. Risk assessment briefing papers are also another way in which system descriptions are kept up to date. This part is considered comprehensive and compliant.

The risk assessment process is used to check water supply system descriptions. Modelling is also undertaken. Flow diagram checklists are also used and are considered comprehensive and compliant.

The flow diagrams, coupled with the risk assessment reports and the DWQMSM (Version 2 authorised on 29/09/2020 - next review due October 2021), contain current system descriptions.

All evidence sighted contains relevant and adequate information on which to inform a risk assessment and is considered compliant.

Noteworthy Observation: The flow diagram checklist is a noteworthy process (3.1-ADWG-02-E-003 - Flow Diagram Checklist for LTP WTP Flow Diagram.docx) signalling a sound understanding of the requirements of the Framework. System descriptions are considered succinct and comprehensive.

C 2.2 Assessment of water quality data

A process is in place for assembling historical water quality data. Table 4-5 (p23) of the DWQMSM states the process for assembling historical and other water quality data that is required for the risk assessment. The process covers the expected sources of information for a sound risk assessment. A risk assessment calendar is used to schedule the risk assessment reviews. The process is considered compliant.

The process includes the scheduling of internal audits prior to the annual risk review with findings being used to inform the risk review.

Noteworthy Observation: Hunter Water has now scheduled the internal audit to occur prior to the annual risk assessment review - an approach considered best practice and worthy of note.

C 2.3 Hazard identification and risk assessment (Compliant)

An enterprise level risk methodology is in place, contextualised for water quality within the catchment to tap water quality risk assessment guideline. Both documents are considered adequate and current.

A process is in place for periodically updating the risk assessment. Risk assessment reviews are scheduled within the risk assessment calendar by Operating Licence period. The frequency and focus of the reviews are considered adequate and current.

Element 3 Preventive measures for drinking water quality management

C 3.1 Preventive measures and multiple barriers (Compliant)

The processes described under Element 2 include a requirement to identify controls and multiple barriers. The risk assessment methodology includes a step for identifying and assessing residual risk (with the controls in place). A requirement to assess residual risk is covered as 'Controlled' risk in HW2008-704 17.004 (Evaluate Existing Controls, p17). A process is in place to capture additional controls where the residual risk is considered unacceptable (HW2008-704 17.004 (Section 4.5.2, p18)). HW2008-704 17.004 includes a requirement to specify the methodology for assessing and monitoring treatment effectiveness (Section 4.6.4, p21). Additional control effectiveness once implemented, is reviewed at the next risk review. Processes are considered adequate and current.

C 3.2 Critical Control Points (Compliant)

A process is in place to identify and document critical control points across the water supply system (under the organisation's responsibility).

The DWQMSM states the process for identifying CCPs at Table 4-8, p25 and in detail in HW2015-1444 3.001 Procedure - Establishing and Reviewing Drinking Water Critical Control Points 28/10/2020) – responsibilities for CCP change management are clearly identified. The DWQMP includes a section on CCPs (Section 2.3.2). The DWQMSM refers to both CCPs and 'critical operating points' or COPs. The DWQMP refers to 'Control Operational Points'. A disconnect exists between the two documents - this observation is picked up under Element 10 to avoid double-counting.

A detailed process is included for establishing and reviewing CCPs (HW2015-1444/3.001). The DWQMP states that the ADWG decision tree is used to help identify CCPs.

A process is in place requiring operational procedures to be in place for CCPs and documented within the CCP tables.

Element 4 Operational procedures and process control

C 4.1 Operational Procedures and Process Control (Compliant)

Table 4-9 (p27) of the DWQMS and Section 2.4.1 (p20) of the DWQMP cover the process for identifying the required procedures for processes and activities from catchment to consumer (essentially the risk assessment process - covered in detail in Elements 2 and 3). The Hunter Water portal ('Reservoir') is used to store documents related to the water management framework including procedures. Folder HW2014-1563/3/1 is the repository of operating manuals. The process is considered adequate and is maintained.

Noteworthy Observation: The Reservoir portal is considered worthy of note not just from an ease of retrieval of documentation but also in UX thought given to the layout.

C 4.2 Operational Monitoring (Compliant minor shortcomings; Recommendation 2021/3.1.1-1; OFI 2021/3.1.1-4, OFI 2021/3.1.1-5)

Table 4-10 (p27) of the DWQMSM and Section 2.4.2 (p20) of the DWQMP describe the process for operational monitoring including for CCPs. Both the DWQMSM and the DWQMP state that online monitoring is in place for critical operational parameters and controlled through SCADA. Both the DWQMSM and the DWQMP state that other monitoring is undertaken to support the online monitoring.

A process is in place, and current, to ensure monitoring results can be trended and acted on if a deviation is noted. A practice note sets out the requirements that need to be met and the actions the treatment contractor is required to take (point 3 in particular).

A process is in place to ensure adverse monitoring results are communicated to the relevant personnel in a timely fashion. Checklists and response flow diagrams exist for CCP exceedances, covering notification requirements. NSW Health requested that the CCP for turbidity for groundwater sources be reviewed as part of this audit. Coverage of turbidity for the CCPs at Lemon Tree Passage was confirmed as being in place as part of MAN-2927-5. CCP notification occurs through TEM-2817-2.

While there is a process for accessing and understanding the operational monitoring undertaken by other parties, NSW Health requested that the auditors review the process and adequacy of this process for ensuring drinking water quality standards for water quality supplied to (and received from where appropriate) MidCoast Council and Central Coast Council. The water quality monitoring plan includes a section on monitoring of water quality at handover points with other parties (Section 2.5, p5). The supply agreements which in part govern the water quality requirements, are reasonably old and need to be reviewed as several shortcomings were observed. The Hunter Water/Gosford City Council agreement is March 2006, 15 years old. The Hunter Water/MidCoast Council agreement is dated September 2002, 19 years old. Both documents should be reviewed. The MidCoast Council agreement is past its 10-year review but still current because of the wording of the clause in the Agreement. The agreement refers to the 1996 ADWG rather than a current version. It has a requirement to meet Water Specifications but there is no section stating what these are, other than a reference to the out of date guidelines in Clause 27b).

It is noted that Hunter Water is currently developing a notification protocol between itself and Central Coast Council, but this is not yet finalised and implemented (it was provided as additional evidence). Hunter Water maintains online water quality monitoring at the handover point (Bushells Ridge). Monitoring involving laboratory analysis commenced from September 2021. Although the water supply agreements do not reflect current status, in practice, operational monitoring is being undertaken and therefore, the shortcoming is considered minor.

A monitoring plan is in place which covers many different types of monitoring across all of Hunter Water's operations including audit monitoring of the treatment contractor's operations and DWQMP. The treatment contractor has monitoring in place for its obligations under the contract. Reasons for the monitoring approach are provided in the monitoring plan included in Section 8 (p37) which provides evidence to confirm discussion with NSW Health on implemented changes (an approach considered good practice from a water quality governance perspective).

NSW Health requested that the auditors review the approach to pesticide monitoring and *Naegleria* monitoring (the latter originating from a distribution risk assessment workshop in 2018). Pesticide monitoring has been reduced to a set of 38 determinands but with a wider set in wet weather events. This approach is considered sound. For *Naegleria* monitoring, Hunter Water provided a report backed by an initial dataset, from a designed monitoring program. The approach for selection of sites (p7) and frequency of monitoring outlined in the strategy document is sound. There are some minor typographical errors in the document which should be addressed but these are not considered shortcomings as they do not affect the intent or content of the strategy. The strategy is appropriate for rolling out in the coming warmer months.

As an opportunity for improvement, it may be of use to consider a requirement to collect a sample for *Naegleria* analysis if a distribution reservoir integrity breach is detected. It may also be useful to further consider the impact of flow reversals in the Central Coast Pipeline connection on the potential for increasing *Naegleria* risk (biofilm /sediment suspension and chlorine demand risk).

NSW Health also requested that the auditors review the algal alert and monitoring / management framework. Hunter Water is undertaking a series of research projects (in full disclosure, one of which D2K Information (of which Dr Annette Davison is a founder) is undertaking) to better understand and improve its algal monitoring. A discussion between the auditor and the local NSW Health representative confirmed NSW Health's satisfaction with this approach and that NSW Health would be appraised of the outcomes through the Joint Operational Group (JOG) meeting channel. Overall, the evidence base for monitoring is considered sound.

The water quality monitoring plan is current (Version 2, September 2021), updated with results of review and from the annual risk assessment update. The plan is reviewed as part of the NSW Health liaison process and during the external operating licence audits. The efficacy of the program is also reviewed as part of the annual risk assessment process.

The compliance shortcoming is driven by the currency of the agreements in place with Central Coast Council and MidCoast Council. A recommendation has been provided to address this shortcoming.

C 4.3 Corrective Action (Compliant)

Documented procedures are in place for immediate corrective actions required to re-establish process control following failure to meet target criteria or critical limits. A process is in place to identify the cause of any loss of control and if necessary, to modify the process (see Element 3). A process exists to record and internally report any loss of control at a critical control point (see Element 3 and Element 6). A process is available for timely management of unexpected events. The process is considered sound and is maintained.

C 4.4 Equipment capability and maintenance (Compliant)

A process exists for selecting equipment which can meet the required water quality objectives (reliability, accuracy, sensitivity). A process is in place for verifying the accurate and reliable operation of equipment. See findings for See Element 2, Element 9 and Element 12. Table 4-12 (p29) of the DWQMSM and Section 2.4.4 (p23) of the DWQMP which describes the process in place for inspection and maintenance of all critical equipment (for the treatment plants: planned maintenance and breakdown, asset condition, an asset management system and instrument calibration; for the distribution system: preventative maintenance practices facilitated through Asset Operation and Maintenance System AOMS (civil assets) cards and Ellipse (electrical/ mechanical assets) for managing work orders. The process is considered sound and findings in the asset management clause support this finding (including the wider process of state of the assets update).

C 4.5 Materials and chemicals (Compliant; OFI 2021/3.1.1-2)

Table 4-13 of the DWQMSM (p30) and Section 2.4.5 of the DWQMP (p23) cover the processes in place for selecting appropriate suppliers to ensure use of approved drinking water treatment chemicals and set specifications for the chemicals. The processes are sound and include the required items for consideration.

A process is in place to ensure that materials that come into contact with drinking water meet appropriate requirements and are from approved suppliers (as per ADWG (2021, version 3.6, p66) materials and chemicals requirements). The process is considered comprehensive.

The Standard-STIS-408-Water-Quality-Acceptance-Testing (HW2009-2368/2/43.001 Version 2 12/5/2019) is very comprehensive but would benefit from re-iterating a requirement to ensure materials in contact with drinking water must be AS/NZS 4020 compliant. This identified issue is considered an opportunity for improvement because of the comprehensive nature of the process overall.

Chemical requirements are managed through the treatment operations contract. Section 2.4.5 (p23) of the DWQMP covers the process for chemical handling. The process is considered adequate. The process has a requirement for the provider to include a certificate of analysis. Management of test results is conducted by the laboratory technician who enters these into the bulk chemical spreadsheet. The process is considered adequate. A quality assurance and quality control system is in place with bulk water suppliers (Central Coast Council) and while not considered adequate, it is noted that this is being addressed.

Noteworthy Observation: Hunter Water's process for managing materials and approved products and manufacturers is comprehensive and well set out on the website.

Element 5 Verification of drinking water quality

C 5.1 Drinking water quality monitoring (Compliant)

Table 4-14 (p31) of the DWQMSM and Section 2.5.1 (p25) of the DWQMP cover the requirements for verification monitoring. Hunter Water's Water Quality Monitoring Plan covers overarching monitoring including verification and the treatment operations contractor's verification monitoring is covered further in the Practice Note. All information is considered sound and meets expected requirements and considerations for appropriate water quality verification monitoring. Considered compliant.

Population served is used as the basis for establishing the representativeness of the monitoring plan. This approach is in line with ADWG and NSW Health guidance. The monitoring plan also contains a table mapping the monitoring types against the Framework element requirements. The monitoring plan is updated based on the annual risk review updates (evidence of review was noted in the document history information (Version 2. Change to new template and update based on annual risk update)). The process of updating the monitoring program after the annual risk review is considered noteworthy. Reliability is ensured through use of a NATA accredited laboratory for both sampling and analysis. EnviroSys is used to collate and analyse data. Considered compliant.

Hunter Water has a process in place whereby it audits its sampling and analysis provider to ensure appropriate implementation of the program. ALS undertakes auditing as part of its own systems, which also includes ensuring staff are trained appropriately. Considered compliant.

A shortcoming in process implementation was picked up under Clause 3.1.2 with the compliance grade and recommendation captured there, to avoid double-counting.

Noteworthy Observations: As well as being comprehensive, the monitoring plan contains a table mapping the monitoring types in the plan, against the Framework element requirements - an approach considered noteworthy practice. The process of updating the monitoring program after the annual risk review is also considered noteworthy.

C 5.2 Consumer Satisfaction (Compliant)

Table 4-15 (p31) of the DWQMSM and Section 2.5.2 (p25) of the DWQMP cover the process for recording all consumer water quality complaints, actions taken. The process also requires training of employees. A process is also in place for recording the actions taken to address the customer response. Process is considered compliant. See also information within Element 4 in relation to monitoring.

C 5.3 Short-term evaluation of results (Compliant)

Table 4-16 (p32) of the DWQMSM and Section 2.5.3 (p25) of the DWQMP cover the process for regular review of water quality monitoring and customer water quality complaints. The process is considered sound as it covers both daily drinking water quality data review and daily consumer satisfaction review.

See also comments relating to Monthly Water Quality Summary Reporting Procedure.DOC (HW2009-654/5/12.006 Version 3.3 08/06/2021. Issues in terms of evaluation of sample number compliance review have been captured in C5.1 to avoid double-counting.

Procedures in place for the evaluation and reporting of water quality results to external agencies (NSW Health) are covered under Element 10. Quarterly NSW Health joint meetings are also undertaken and are used to evaluate water quality results. Process considered sound and is maintained.

C 5.4 Corrective actions (Compliant)

Table 4-17 (p34) of the DWQMSM and Section 2.5.4 (p26) of the DWQMP cover the process for corrective action in response to water quality monitoring non-conformances or consumer feedback. Evidence reviewed as part of assessing Element 3, 4 and 6 confirms the process is sound and is maintained.

Element 6 Management of incidents and emergencies

C 6.1 Communication (Compliant)

Clearly defined protocols are in place including internal and external communications during incidents and emergencies. Table 4-18 of the DWQMSM (p35) and Section 2.6.1 (p27) of the DWQMP cover the process. There are various incident and emergency management protocols in place that make up the overall incident and emergency response framework. A new potable and recycled water incident response map has been developed to improve clarity of response, based on the hazard type. The following procedure has been updated in response to the previous OL recommendation: 3.1.2-R 2020-01-E-001 - HW2006-2906 4 6.023 Procedure - Notification of Water Quality Events of Potential Public Health.DOCX and key staff have been taken through awareness sessions on the framework and revisions. Considered compliant from a defined protocol perspective.

The Practice Note PN 201 is now quite old (2013). Table 4-18 of the DWQMSM (p35) notes that NSW Health has been involved in the development of the notification protocol.

Table 4-18 (p35) of the DWQMSM and Section 2.6.1 of the DWQMP (p27) cover the process for public and media communication templates and notifications.

Section 10.5 (p25) of the Corporate Emergency Management Plan provides information on the Operations Coordinator Role and Responsibilities, which include a requirement for several responsibilities including:

- > being responsible for identifying and resolving all immediate operational aspects of an incident or emergency
- > being the primary and ongoing primary point of contact for field resources
- > providing technical advice, operational and solution options to field resources
- > identifying critical issues, immediate threats and keeping the Incident Controller aware of any changing circumstances as well as preparation of SitReps (Situation Reports).

Section 9.3 (p9) of PRO-2803-1 covers a requirement for the treatment operations contractor to liaise with Hunter Water with liaison procedures covered in the Incident and Emergency Management manual (confirmed at the Lemon Tree Passage WTP site visit).

C 6.2 Incident and emergency response protocols (Compliant minor shortcomings; Recommendation 2021/3.1.1-2, Recommendation 3.1.1-3, OFI 2021/3.1.1-6, OFI 2021/3.1.1-7)

Table 4-19 (p36) of the DWQMSM and Section 2.6.2 of the DWQMP (p27) cover incident and emergency response protocols.

Section 4 (p14) and Section 7 (p20) of the Corporate Incident and Emergency Management Plan cover defined levels of water quality incidents and emergencies and how they are escalated. The treatment operations contractor abides with the incident levels of Hunter Water but also has its own process for

classifying incidents (sighted at the Lemon Tree Passage WTP site visit). Procedures to support the correct assignment of categories and notification were also sighted and confirm the process. There is a slight disconnect over what incident levels require an investigation and root cause analysis to be undertaken, this fact is important as the ADWG Framework requires any incidents or emergencies to be investigated and protocols revised if necessary. The Hunter Water incident and emergency categories are four-fold (minor, moderate, major, crisis-emergency). Only the major and crisis-emergency levels have a notation about a requirement for incident debrief notes and action records to be kept (p22). A specific notation of debrief requirements, against each incident level category, would improve clarity and conformance against the Framework. Considered compliant with a minor shortcoming.

Table 4-18 of the DWQMSM (p35) includes a statement that the incident management process was developed with the involvement of NSW Health. The treatment operations contractor is involved in the water quality incident response plans. Minutes of the water quality meeting from September 2021 confirmed the ongoing review process for the Procedure to notify NSW Health of events with potential public health impact. The auditor requested further information from the Local Health District representative of their involvement in development of incident response plans. They confirmed that engagement had not occurred in recent times due to the COVID impost on time. However, it was noted that NSW Health had had some engagement with Hunter Water on the development of a health complaints guideline, of which its finalisation was unclear. Considered compliant with a minor shortcoming with a recommendation to close the communication loop on finalisation of the guideline (TRIM Reference: HW2010-95 2 12.010 Guideline - Water Quality Health Complaints) with NSW Health.

Table 4-19 (p36) of the DWQMSM and Section 2.6.2.1 of the DWQMP (p27) cover the process for training in incident and emergency response procedures. The content of the process is sound.

Table 4-19 (p36) of the DWQMSM and Section 6.2.1 of the DWQMP (p27/8) cover Element 6.2.3 (*Investigate any incidents or emergencies and revise protocols as necessary*) but do not specifically state a requirement to revise procedures as necessary following an incident or mock scenario. Further evidence was reviewed to confirm if the requirement was explicitly stated elsewhere. The Corporate Emergency Management Plan or PRO-2803-1 do not specifically state a need to update procedures following an incident although a debrief requirement is stated and PN201 WQ Incident Procedure contains a requirement to undertake a root cause analysis and outline actions required to prevent or minimise recurrence of an incident. The Integrum reports do not contain a prompting field for the need to undertake a debrief or any notations on areas for improvement of procedures and processes. Considered compliant with an opportunity for improvement given that the overall package of incident and emergency management material covers off on the requirements of Element 6.2.3.

Element 7 Employee awareness and training

C7.1: Employee awareness and involvement (not in scope so ungraded, included for context only)

A process is in place to ensure new employees and contractors are made aware of the importance of water quality management, and the role they play in it. Table 4-20 of the DWQMSM (p38) and Section 2.7.1 (p29) of the DWQMP cover the process for training in water quality awareness. All staff and contractors are required to complete the Drinking Water Quality Training and Awareness Program which is accessed through Employee System Learning Application (ELSA). An induction process is also covered. Process considered sound and maintained.

C7.2: Employee training (not in scope but reservoir training component requested for review by NSW Health – Compliant; OFI 2021/3.1.1-8)

Table 4-21 (p38) of the DWQMSM and Section 2.7.2 (p29) of the DWQMP cover the process for training for the purposes of this component and induction is also covered as noted in C7.1. Regular contractors to the treatment operations contractor are required to undertake detailed training on specific aspects (process confirmed through interviews and sighting of records at the site visit). Both Hunter Water and the treatment operations contractor include a requirement to understand and record training needs through a matrix. Considered compliant.

Mentoring is not specifically stated but the intent of the content of both the DWQMSM and the DWQMP supports a process for mentoring in practice.

Table 4-21 (p38) of the DWQMSM and Section 2.72 (p29) of the DWQMP cover the process of competency. As an example, operators must achieve appropriate certificate level qualification and the laboratory services provider is NATA certified which requires staff to be trained and competent. Currency of NATA certification was confirmed. Considered compliant.

Table 4-21 (p38) of the DWQMSM and Section 2.72 (p29) of the DWQMP cover the process of identifying training needs and resources. While the training material identifies that only holes in reservoir roofs greater than 20 mm should be reported, additional evidence provided by Hunter Water confirmed that the inspection form prompts the user to review a large range of risk factors, which would pick up any holes and reservoir integrity issues, and report on them. Considered compliant overall.

Element 9 Research and development

C 9.1 Investigative studies and research monitoring (Compliant)

Table 4-24 (p43) of the DWQMSM describes Hunter Water's research and development process and Section 2.9.1 (p31) of the treatment contractor's DWQMP does the same. The process meets the requirements of a sound investigative process, therefore considered compliant.

The process described in the relevant sections of the DWQMSM and the DWQMP describe active partnerships with external bodies as well as with each other. The process described is comprehensive and considered compliant.

A specific Innovation Committee has been set up for the treatment operations contract and its purpose is to evaluate innovations and organise fellowships to study new technologies.

C9.2 Validation of Processes (Compliant minor shortcomings; Recommendation 3.1.1-4)

Table 4-25 (p42) of the DWQMSM and Section 2.9.2 of the DWQMP (p31) describe the process of setting critical limits including the use of national (ADWG) and international (USEPA) guidance, in consultation with NSW Health. A specific document exists for establishing and reviewing CCPs, however, documentation of the evidence base for limits has some minor shortcomings.

Table 4-25 (p42) of the DWQMSM and Section 2.9.2 of the DWQMP (p31) detail the validation process including review of WTP performance against contractual, critical and other limits.

Table 4-25 (p42/43) of the DWQMSM and Section 2.9.2 of the DWQMP (p31) detail the re-validation process.

C9.3 Design of Equipment (Compliant)

Table 4-26 (p43) of the DWQMSM and Section 2.9.3 (p32) of the DWQMP cover design of equipment. Hunter Water has a specific internal design validation guideline. The guideline covers many aspects of Hunter Water's business including public health and is considered comprehensive and ties in with the asset creation framework. Considered compliant.

As noted above, the design validation guideline is comprehensive and covers commissioning and other methods to ensure delivery of water quality outcomes. The treatment operations contractor also has the ability to access pilot infrastructure, if required.

Noteworthy Observation: The design validation guideline is comprehensive and is a noteworthy practice for integrating water quality outcomes with fit for purpose asset creation.

Element 10 Documentation and reporting

C10.1 Management of documentation and records (Compliant)

A process is in place for documenting, recording and allowing ready retrieval of information relevant to all aspects of drinking water quality management. Overarching requirements are covered in the DWQMSM (Table 4-27, p44) and the treatment operations contractor's DWQMP (Section 2.10.1, p33). Hunter Water uses the DWQMS intranet and Asset Operation Framework intranet pages for documenting, recording and retrieval of water quality pertinent information. Hunter Water also has certification to ISO 9001. The treatment operations contractor has a documented information procedure as well as being required to adhere to Hunter Water's records management procedure. Other databases are used generally for recording water quality information including EnviroSys, SCADA and customer relationship information.

Hunter Water is currently exploring improved ways to integrate systems across the business. The IMS principles document describes how the organisational requirements are integrated to help reduce silo thinking - with an objective of improving all documentation and records for all aspects of drinking water quality management. TRIM is used for document and records management in particular.

A control process is in place to ensure that all documentation in use is current and not obsolete. Table 4-27 (p44) of the DWQMSM and Section 2.10.1 of the DWQMP cover the process for documentation control. The requirements and expectations for document control are set out specifically in HW2013-421 22.002. This document is comprehensive and includes a clear figure of document hierarchy at Figure A (p4). The treatment operations contractor is also certified to ISO 9001 and uses CMMS for handling of records.

Section 4.9 of the document includes information on managing end of life documents. Records management is covered at Section 5. Considered compliant.

C10.2 Reporting (Compliant; OFI 2021/3.1.1-9)

The DWQMSM describes the process for reporting at Table 4-28 (p45) and in the DWQMP at Section 2.10.2 (p33). The processes described cover internal and external reporting and are comprehensive including drinking water management and operational reporting from overarching statutory and corporate requirements through to operational issues. The treatment operations contractor reports internally and externally to Hunter Water via a monthly contract report. Reports are not currently controlled because they are a one-off document (and are therefore not subject to the controlled document conditions). 2LOD covers the report sign-off and responsibilities for communication.

Hunter Water produces an annual report which is publicly available on its website. The treatment operations contractor DWQMP is silent on the production of an annual drinking water quality report, however, detailed water quality information is reported to Hunter Water on a monthly basis. Considered compliant with a potential for improvement for the treatment operations contractor's DWQMP and reporting process.

Element 11 Evaluation and audit

C11.1 Long-term evaluation of results (Compliant; OFI 2021/3.1.1-10)

The DWQMSM covers the process for collecting and evaluating water quality data to test for trends, associations and non-conformances at Table 4-29 (p47). The treatment contractor covers this same process at DWQMP Section 2.11.1, p34. The data are used to help inform the risk assessment and the improvement process (see comments for Element 2/3 and Element 12).

Evidence sighted in reviewing Element 10 reports, confirms that customer feedback data and outcomes are reviewed and used to improve the system, Element 5 (Table 4-15, p31) also covers the process for evaluating customer satisfaction.

Hunter Water uses EnviroSys for collating results of manual samples and SCADA for online monitoring data. Other contextual data are included in the DWQMSM and DWQMP in various sections and appendices. The system assessment and risk assessment process are also used to store and review data for the currency of the risk review period (see Elements 2 and 3 for more information).

The DWQMSM states (Table 4-29, p47) that the process for documentation and reporting of results includes the Annual Compliance and Performance Report to IPART.

HW2015-1303 6.002 (Section 5, p7) covers historical water data analysis, documentation and reporting as part of the risk assessment process. Verbal confirmation was provided that the responsibility for evaluation, documentation and reporting of long-term water quality data sits across several teams e.g. science team, catchments team and water quality team. The process is considered sound with an opportunity for improvement identified.

C11.2 Audit of drinking water quality management (Compliant)

The DWQMSM covers the process for internal and external audits at Table 4-30, p47 and in the DWQMP, at Section 2.11.2, p34. Tools and documentation to support the audits include an auditing programme and procedure.

Hunter Water is subject to external review of its systems through the IPART operational licence audits and through certification, surveillance and re-certification audits. The treatment operations contractor is subject to the same scrutiny as well as being required to have an external Exemplar Global-certified audit of its DWQMS. The treatment operations contractor also undertakes site-based inspections.

The DWQMSM covers the process of documenting and communicating audit results at Table 4-30 (p48) and the DWQMP in Section 2.11.2 (p34). The process is considered sound and maintained.

Element 12 Review and continual improvement

C12.1 Review by senior executives (Compliant)

The DWQMSM covers the process of review at Table 4-31 (p49) and the DWQMP in Section 2.12.1 (p35). Hunter Water's process includes the programming of capital, operational and procedural improvements. The IMS includes a requirement (Section 4.6, p8) to review documents on a range of triggers including changes in the external operating environment.

Hunter Water has an Enterprise Risk Management Framework in place and anything out of appetite is flagged in the risk assessment process. There is an asset management framework which addresses

identified out of appetite items, via gateways through the Management Investment Committee. The Asset Creation Framework has an investment management page which covers decision-making processes. The water resilience team and safe and reliable water service groups were sighted as part of this process. Process considered sound and is maintained.

C12.2 Drinking water quality management improvement plan (Compliant)

The DWQMSM covers the process for managing improvements at Table 4-32 (p50) and in the DWQMP at Section 2.12.2 (p35). The treatment operations contractor conducts performance improvements under procedure PRO-151 and through taking part in the risk assessments (at which improvements are identified). The process for tracking progress of the DWQIP is documented.

The Drinking Water Quality Improvement Plan is present, current and covers a variety of aspects relating to water quality improvements. Considered sound and maintained.

Recommendations

Recommendation 2021/3.1.1-1: By 31 March 2023, undertake a review and revision of both the MidCoast Council and the Central Coast Council water supply agreements, with particular attention to quality, quantity, maintenance, operations and ownership aspects.

Recommendation 2021/3.1.1-2: At the next Corporate Incident and Emergency Management Plan review, review incident level categories and make clear which ones require a root cause analysis / incident investigation.

Recommendation 3.1.1-3: By 30 June 2022, communicate finalisation of the health complaints guideline (TRIM Reference: HW2010-95 2 12.010) to NSW Health.

Recommendation 3.1.1-4: By 1 November 2022, improve documentation of the evidence base for CCP limits (e.g. through annotations in the CCP limits table).

Opportunities for improvement

OFI 2021/3.1.1-1: Address noted document history and typographical errors and disconnect between procedure and register (Procedure HW2012-441 has a disconnect between the required information for recording document version and the footer information (Footer: Version 5 11/22/2019 vs Doc History Table: Version 5, November 2021)).

OFI 2021/3.1.1-2: At the next revision of Standard-STS-408-Water-Quality-Acceptance-Testing (HW2009-2368/2/43.001 Version 2 12/5/2019), consider adding in a specific requirement to meet the standard AS/NZS 4020 for materials used in contact with drinking water.

OFI 2021/3.1.1-3: Consider adding the review cycle on the flow diagrams to allow currency to be confirmed.

OFI 2021/3.1.1-4: Consider adding a requirement to collect a sample for *Naegleria* analysis if a distribution reservoir integrity breach is detected.

OFI 2021/3.1.1-5: Consider the usefulness of collecting a sample for *Naegleria* analysis during flow reversal events in the Central Coast Pipeline connection (to determine whether these events increase *Naegleria* proliferation risk (e.g. through biofilm /sediment re-suspension and chlorine demand risk).

OFI 2021/3.1.1-6: At the next Corporate Incident and Emergency Management Plan review, update the emergency management documentation and the drinking water management system documents, to include an explicit requirement to update procedures / protocols following an incident and/or scenario training exercise.

OFI 2021/3.1.1-7: Consider review of Practice Note PN 201 Water Quality Incident Procedure – Notification considering it is last dated 2013.

OFI 2021/3.1.1-8: It may be useful to specifically state that mentoring is undertaken (but this is not essential).

OFI 2021/3.1.1-9: Consider incorporating a requirement in the next contract for the treatment operations contractor to produce an annual report to Hunter Water on all relevant aspects of drinking water quality management.

OFI 2021/3.1.1-10: Although HW2015-1303 6.002 Catchment to Tap Water Quality Risk Assessment Guideline currently details the process for the evaluation, documentation and reporting of long-term water quality data, consider formally documenting the responsibility for this process.

Clause 3.1.2

Table 3-5 Clause 3.1.2 compliance grade

Subclause	Requirement	Compliance grade
3.1.2	Hunter Water must ensure that the Drinking Water Quality Management System is fully implemented and that all relevant activities are carried out in accordance with the Drinking Water Quality Management System and to the satisfaction of NSW Health.	Compliant (minor shortcomings)
Risk		Target for full compliance
If the Water Quality Management System is not fully implemented, there is a high risk that Hunter Water may not be able to effectively manage risks to water quality and protect public health.		Evidence that the Water Quality Management System is fully implemented and that all relevant activities are carried out in accordance with the Water Quality Management System. Evidence to show that NSW Health is satisfied with the implementation of the Drinking Water Quality Management System.

Summary of reasons for grade

All Framework for Management of Drinking Water Quality elements, except Element 7 (Employee awareness and training, except to the extent required for review by NSW Health) and Element 8 (Community involvement and awareness), were within scope for this audit. Evidence to support implementation of the stated processes in place for both Hunter Water and the treatment operations contractor was largely available or where provided, had some areas of non-compliance. Many areas of noteworthy practices were identified under this clause including:

- > Element 2: The flow diagrams are considered best practice in terms of layout and compliance with the full intent of the Framework.
- > Element 2 and 3: The risk assessment briefing and summary papers are considered exemplary in terms of the quality of input and output from the risk assessments.
- > Element 4: The process of using the risk review to update the monitoring plan and having documentation to support that it occurred in practice, is an exemplary process from a water quality governance and documentation perspective.
- > Element 10: Raising a self-initiated non-conformance against the identified systemic document control risks is noteworthy because it demonstrates a sound culture for improvement, implemented in practice.

Shortcomings driving the grade include:

- > Element 1: Key stakeholder information is not implemented equally across all incident and emergency documentation with MidCoast Council and Central Coast Council missing from the Key Emergency Services and Stakeholder Contact List in the Corporate Emergency Plan (Recommendation 2021/3.1.2-1).
- > Element 3 and 4: The CCP limit tables for the Lemon Tree Passage water treatment process have some inconsistencies with SCADA, and two typographical errors for limits (although there is no suggestion that unfit product is delivered in practice) (Recommendation 2021/3.1.2-3; Recommendation 2021/3.1.2-4).
- > Element 3: Whilst improvement actions are recorded in the risk assessment reports against all medium controlled risks and above, some were not recorded in the risk register (Recommendation 2021/3.1.2-2).
- > Other areas of shortcomings noted include document currency clarification for the network chlorinators CCP (Recommendation 2021/3.1.2-4), completion of fields in forms (Recommendation 2021/3.1.2-5) and strengthening reporting of verification monitoring for the water quality committee (Recommendation 2021/3.1.2-6).

Discussion and notes

Element 1 Commitment to drinking water quality management

C 1.1 Drinking water quality policy (Compliant)

As per the stated process in the DWQMSM and the DWQMP, current drinking water policies were sighted on the wall at the Lemon Tree Passage water treatment plant, at the site visit.

C 1.2 Regulatory and formal requirements (Compliant minor shortcomings)

The process for periodic identification and communication of changes in regulatory and formal requirements, is implemented in practice.

Implementation occurs in practice as evidence was sighted (email from DWQMS Team Lead to Group Manager Audit, Assurance and Management Systems, 5 October 2021 requesting register to be updated and update actioned in Change History sheet) to confirm that the register is kept up to date including the addition of new material from the 2021 ADWG (version 3.6) update on short term exposure values. Although the change request had been actioned in the Change History sheet, the ADWG version had not been updated in the register part of the file (the 'Quality' tab) with the old version (3.5) still cited. Considered a minor shortcoming that can be managed through recommendations under the quality management clause.

Interviews with both the water treatment operations contractor and Hunter Water staff confirm that responsibilities are understood, and other evidence sighted for policy and training confirms this criterion is met in practice.

C 1.3 Engaging stakeholders (Compliant minor shortcomings)

The current stakeholder register was tested for implementation.

Records were available to show that communication with stakeholders occurs in practice.

Table 4-3 of the DWQMSM documents the communication mode and frequency for external and internal stakeholders and NSW Health specifically. A sample of records confirmed that communication occurred in practice within the audit date scope (NSW Health, Water Quality Committee). Sample of records requested for customer complaints communication was provided.

The Your Voice page on Hunter Water's website confirmed stakeholder communication during the audit period (Customer and Community Advisory Group (CCAG) Meeting (via Zoom) 10 August 2021 CCAG Meeting 09 March 2021 CCAG Meeting 15 December 2020). Considered compliant.

The process of managing stakeholder details is covered in DWQMSM in Table 4-3, p20 and within the DWQMP at Section 2.1.3, p9. The stakeholder list is reviewed at the time of the manual's review (confirmed as Version 3 updated September 2021). The Corporate Emergency Management Plan includes a Key Emergency Services and Stakeholder Contact List at p42, which is reviewed annually according to the Business Resilience Calendar, however, the document history in the Corporate Emergency Management Plan states 3 monthly. This aspect is considered a minor disconnect between stated process and implementation, as the review cycle is actually more frequent.

MidCoast Council is not included in Key Emergency Services and Stakeholder Contact List in the Corporate Emergency Plan but is covered in Table 1-2 of the DWQMSM (p6). Some currency uncertainties and shortcomings exist but the information available in practice shows that currency is generally in place, is frequent enough for this criterion, and is unlikely to compromise objectives.

Element 2 Assessment of the drinking water supply system

C.2.1 Water supply system analysis (Compliant; OFI 2021/3.1.2-1)

The risk assessment summary reports confirm the appropriateness of the team assembled for the risk assessment (including NSW Health representation). Hunter Water has dedicated appropriate financial and human resources to the team to allow it to do an effective job. Hunter Water generally relies on a steady state of human resources, which it funds. If a material change to the system is required, increased resourcing is planned for. Major projects can be funded to resource requirements. Each division also undertakes operational budget planning. The annual update to the Management Investment Committee was provided as evidence and confirmed the advice provided at interview of what happens in practice. Considered compliant.

Flow diagrams have been created. A sample from Lemon Tree Passage and Gresford Water Treatment Plants/Systems and the overall Hunter Water supply system, were sighted. Taken as a whole, the diagrams are compliant with the intent of this criterion confirming implementation.

Of the five flow diagrams reviewed, all had authorisation information. Roles for the authorisation are not stated but can be inferred from other information (such as the team information) sighted in this audit. Authority of the persons reviewing and approving the flow diagrams is therefore considered acceptable but the process would benefit from improving formalisation of authority for approval.

Four out of five of the flow diagrams clearly show the handover points between parties. The Hunter Water Water Supply Zones schematic does not show the handover points, but it does not need to, as it is a representation of the whole system. Considered compliant.

The risk assessment summary reports contain system descriptions, confirming that the process for describing and documenting water supply system descriptions, is implemented in practice.

All evidence sighted as outputs of the process described, was in place. Considered overall compliant.

Noteworthy Observation: The flow diagrams are considered best practice in terms of layout and compliance with the full intent of the Framework.

C 2.2 Assessment of water quality data (Compliant)

The historical water quality data has been reviewed according to the stated process.

A risk assessment was completed for Lemon Tree Passage and Gresford systems according to the calendar requirements (May 2021 stated in calendar, Gresford risk assessment undertaken Monday 10 May 2021, Lemon Tree Passage undertaken Monday 31 May 2021). The briefing and summary papers contain the water quality and other data as stated in the process. Compliant.

Summaries of the water quality data have been produced and used to inform the risk assessment (Gresford data: summarised in Appendix B of the summary paper. Lemon Tree Passage data: summarised in Appendix C of the summary paper).

Graphs and trends of the historical water quality data, have been produced and used to help inform the risk assessment (Gresford data: graphed and trended in Appendix B of the summary paper. Lemon Tree Passage data: graphed and trended in Appendix C of the summary paper).

The risk assessment is comprehensive and includes identification of key risks and hazards per system assessed (e.g. Lemon Tree Passage: Table 22 Key Lemon Tree Passage WTP Catchment Risks, p30, Gresford: Table 40 Gresford Hazard Screening Assessment, p69).

Noteworthy Observation: The risk assessment briefing and summary papers are considered noteworthy in terms of the quality of input and output from the risk assessments.

C 2.3 Hazard identification and risk assessment (Compliant)

Both health and aesthetic hazards have been identified and documented comprehensively in the risk assessment (e.g. Lemon Tree Passage: Section 3 of summary report). Compliant for hazards.

Given the system descriptions and the process steps, the water quality hazards identified are consistent with the expected hazards. Events relating to the distribution system were not covered in this risk review as they were dealt with in previous years, and are scheduled for review post this risk assessment review (line item 17-22-7 in the drinking water quality risk assessment calendar).

Maximum risk is termed 'inherent' risk by Hunter Water. Both the Lemon Tree Passage and the Gresford risk assessment outcomes identified inherent risk (at Column N).

An evidence base for the uncertainty and risk scores is provided in each risk register at Column T (noted as uncertainty/clarification associated with risk management strategies in place (details of workshop discussions related to risk decision making process)).

Uncertainties were assessed for each hazard and hazardous event at Column S (with clarification in Column T).

An evidence base for the uncertainty and risk scores is provided in each risk register at Column T (noted as Uncertainty/clarification associated with risk management strategies in place (details of workshop discussions related to risk decision making process)).

Risk treatments are documented including in the risk assessment report and the risk registers at Column U.

The risk assessments identify priorities for risk management through the classification of risk.

NSW Health representatives were present at both risk assessment workshops and therefore, were aware of any high public health significant risks (sign in sheets in workshop summary reports confirmed representation).

The risk assessment was carried out in line with the stated review currency documented in the risk assessment calendar.

The water quality team and the risk assessment participants taken together (regulator, operator, Hunter Water, consultants, customer), more than met the requirements of 'an appropriate team' for undertaking the risk assessment.

Both NSW Health, customer and external consultant representation was included in the review and therefore, external review is considered met.

Element 3 Preventive measures for drinking water quality management

C 3.1 Preventive measures and multiple barriers (Compliant minor shortcomings)

Both Gresford and Lemon Tree Passage risk assessments include controls which are relevant for the hazard and event they are paired with. Both Gresford and Lemon Tree Passage risk registers have controlled risk identified at Column R. For risks with deemed unacceptable maximum risk scores, residual risk scores and additional controls been documented in the risk register. The risk action table (HW2008-704 17.004, p33) requires risk treatments (with a treatment plan to be developed within 3 months) for all controlled risks of a score of medium and above. Additional controls are identified in Column U. Only Lemon Tree Passage met the criteria for all medium controlled risks to have a corresponding risk treatment identified.

Although required by the procedure, the Gresford risk assessment does not have risk treatments identified for all medium controlled risks - none of the blank cells had a corresponding ALARP. It is noted that Hunter Water is currently reviewing the risk assessment methodology with a change in the status of ALARP (messaging to IPART sighted in this matter) to offset the lack of a treatment action. At interview, it was confirmed that improvement actions had been identified and documented in the summary paper, although not documented in the risk register. Considered compliant with minor shortcomings.

As an observation, the Enterprise Risk Management document has a document control shortcoming: (3.1-ADWG-02-E-001 - HW2008-704 17.004 Enterprise Risk Management Standard.DOCX) states in footer ""Version 1 authorised by Peter Kembrey on 31/10/2018"" but doc history states Version 7). This issue is picked up under Element 10 to avoid double-counting. A risk update after additional control implementation, is undertaken through the scheduled risk review process. The evidence sighted confirms this process happens in practice.

C 3.2 Critical Control Points (Compliant minor shortcomings)

CCPs were tested at the Lemon Tree Passage water treatment plant site visit (3 November 2021). The SCADA interface was sighted for CCP limits. At interview it was stated that the CCPs were identified in 2015 and the process was used at that time (evidence not sighted to confirm this). Hunter Water provided additional information to confirm that CCPs were established before the procedure for Establishing and Reviewing Drinking Water Critical Control Points (HW2015-1444 3.001) was created with the decision tree being used for establishing new CCPs. Hunter Water has not established any new CCPs since the procedure was prepared. Process considered sound.

CCPs have been identified from catchment to consumer. Network CCPs are managed by Hunter Water and the treatment CCPs by the treatment operations contractor (Lemon Tree Passage and Gresford CCP limit tables sampled as evidence). Note, the treatment operations contractor has assigned a CCP for coagulation and pH adjustment, but this is not counted as a Hunter Water CCP.

The limits are defined in the CCP Limits tables for all CCPs as Target Value, Alert Limit, Action Limit, Auto Shutdown, Contractual / Critical Requirement and Hunter Water Critical Limit. Note, for the network chlorinator CCP, there is intentionally no value in the Contractual / Critical Requirement column as the CCP is the responsibility of Hunter Water. The limits for Lemon Tree Passage were the focus of the site visit. The CCPs for coagulation and pH adjustment (noting that this CCP is a Treatment Operations Contractor CCP only), filtration, fluoridation and primary disinfection (chlorination) were reviewed. Shortcomings were noted in the CCP Limits Table: one typographical error for the Contractual/Critical Limit for filtered water turbidity and one typographical error related to fluoride (both acknowledged by Hunter Water). Hunter Water provided additional evidence (SE-073) to state a case for non-materiality. On consideration of the additional evidence, it is the auditor's opinion that the discrepancies constitute a shortcoming, rather than a non-compliance. The shortcomings taken as a whole are not considered material as there was no evidence to demonstrate an impact on Hunter Water's ability to meet defined objectives or assure controlled processes, products or outcomes.

The limit tables identify other contextual information which may impact on public health including the limiting hazards and preventative measures (including durations).

The network chlorinators CCP Limit table includes a column for corrective actions, which are the operational procedures required in the event of an exception. A reference to the incident and emergency management process is also included (such as the notification requirement to Health in the event of an exception).

The DWQMP states (at Section 2.3.2) that the CCP limit tables include corrective actions. The treatment CCP tables refer to the following for corrective actions - MAN-2927 CCP Response Plan part of the Incident and Emergency Management Manual MAN-2799 or HW2014-778/15/2.001. Each CCP limit table includes the preventative measures and monitoring that is used to help maintain business as usual conditions for maintaining target limits.

Two out of three CCP Limit tables were documented as within their review cycle as follows:

- > PA-DW-010-HW2014-778 15 2.008 Register - Lemon Tree Passage WTP CCP Limit Doc Code: TEM-3036-8 Issue Date 26/08/2021 Review Period: 3 Yearly
- > PA-DW-009-HW2014-778 15 2.007 Register - Gresford WTP CCP Limit Table Doc Code: TEM-3036-9 Issue Date 26/08/2021 Review Period: 3 Yearly

The following limit table could not be confirmed as being within its review cycle (although current):

- > HW2015-1303 10.003 Register - Network Chlorinators CCP Limit Table Issue Date: 8/10/2021.

At interview it was confirmed that CCPs are reviewed in the risk assessments or by exception. The process is considered compliant with an opportunity for improvement as the process is confirmed in practice but the limits table should include document history information, for clarity.

The Lemon Tree Passage CCP Limit Table did not align with SCADA although the discrepancies were not considered material (the 10 second delay in SCADA but not in the table, being applied to cover analyser fluctuation / instrument noise (and therefore not related to water quality) and other values in SCADA being more conservative than those in the limits table (additional evidence was provided and confirmed the assessed materiality of the finding (SE-073 Lemon Tree Passage CCP Limit Table Identified Discrepancies.docx)).

Element 4 Operational procedures and process control

C 4.1 Operational Procedures and Process Control (Compliant)

The use of Reservoir (Hunter Water's SharePoint site) and access to the manual for Lemon Tree Passage (MN-HWT-20-7813-4 6 March 2018) and other requested procedures, was demonstrated at interview. All information requested could be easily found and accessed. An updated Lemon Tree Passage manual was provided as supplementary evidence post the site visit. The Asset Operation Framework intranet was also sighted for storage of guideline and other documents. Folder HW2014-1563/3/1, cited as the repository of operating manuals, was checked at interview and found in existence and containing the stated documentation.

Operational staff are involved in production of the procedures and training evidence was provided to confirm that staff are made aware of and trained in the procedures.

All operational documents viewed were found to be current. Other issues associated with document control (such as the Integrum issue of over-writing footers) are noted in Element 10 and considered further in the Quality Management clause.

C 4.2 Operational Monitoring (Compliant minor shortcomings)

The stated practice was (critical operational parameters controlled through SCADA) verified at the Lemon Tree Passage site visit. The other monitoring practices in place to support CCP operation and operation in general, as described in both the DWQMSM and the DWQMP, were confirmed at the site visit. A sample of records from SCADA, calibration and site checks was reviewed. All records were present as stated, other than two records for which the calibration component of the site checklist had not been completed. This is only considered as a shortcoming because the calibration records showed that the calibration for those two dates had been undertaken in practice. The CCP Exceedance Response Plan was available on site. SCADA and other records were in place to confirm daily review of water quality monitoring results. Sufficient equipment is in place to adequately monitor critical limit parameters.

The water quality monitoring plan is current (Version 2, September 2021, updated with results of review and from the annual risk assessment update).

Evidence viewed in the document confirms that results from external channels are used to update the program with clear records to show the changes and inputs.

Noteworthy Observation: The process of using the risk review to update the monitoring plan and having documentation to support that it occurred in practice, is considered noteworthy from a water quality governance perspective.

C 4.3 Corrective Action (Compliant)

Outputs from the processes identified under C4.1, Element 3 and Element 6 were confirmed at the Lemon Tree Passage site visit.

C 4.4 Equipment capability and maintenance (Compliant; OFI 2021/3.1.2-3)

Findings in the asset management clause support implementation of equipment capability and maintenance in practice.

Calibration and maintenance records kept. Photographs of equipment at the Lemon Tree Passage confirm that calibration records are kept. Calibration records (manual) were also sighted at the Lemon Tree Passage site visit and records (spreadsheet) were also provided prior to the site visit. The following were tested:

- 1) Calibration was undertaken according to the stated frequency and procedure.
- 2) Maintenance was undertaken according to the stated frequency and procedure.

Five bench sensors were sampled (DR 300 - Free Chlorine, Merck Prove 100 Spectroquant, TU5200 - Turbidity Meter, Sension Fluoride Meter, Thermofischer pH Meter). 0/5 met condition 1. The calibration cycle for critical equipment is annual (carried out by an external party) and was 48 days out of currency, the previous calibration date being 22-23/09/20 and the most recent date being 9/11/21 (falling outside the audit period). The reason provided for the out of currency status was two-fold:

- > COVID-related travel restrictions
- > The technician being quarantined by NSW Health due to being a close contact.

The reasons for the deficit are taken as legitimate given the current operating context.

Test 2 was assessed under the asset clause. Four critical sensors were sampled (Turbidity WT-LEM-FS1-F03-ANTB7 out of Filter 3 monthly calibration; Free chlorine clear water tank out WT-LEM-CWS-PS1-ANCL2 Monthly calibration; pH WT-LEM-CWS-PS1-ANPH2 clear water tank out monthly calibration and fluoride clear water tank out WT-LEM-CDS-FLU-ANFZ28166 twice yearly calibration). Three months of records were chosen at random (February, June and September 2021). Four out of four critical sensors more than passed their calibration frequencies during the months chosen. A check of paper records was also undertaken at the site visit to confirm the presence of both paper and Excel-based records. Criterion considered compliant given the operating environment.

C 4.5 Materials and chemicals (Compliant)

The following sample size was used for this criterion:

- > Delivery records and certificates of analysis for each chemical for January, March and August (or closest available).

Chlorine gas is tested yearly by IXOM and a certificate of analysis (CoAs) supplied to all Australian water utilities at this frequency. CoAs for PolyDADMAC coagulant (cationic) polymer, chlorine gas, non-ionic polymer and fluorosilicic acid received during the audit period, were reviewed and confirmed.

The Treatment Operations Contractor reviews and records (plant spreadsheets) chemical compliance (impurity limits in the supply contract) and acceptance testing at point of delivery for the following chemicals: alum (SG, pH and temperature), lime and poly (visual). Records reviewed confirmed that analyses are entered as stated. Considered compliant.

A formalised system is in place for the delivery, acceptance and storage of drinking water treatment chemicals. A sample size of each treatment chemical was taken comprising the following: Lime, Cationic coagulant (cationic poly), Coagulant aid (non-ionic poly), Fluoride, Chlorine. The following test was applied:

- > The chemical is stored appropriately to maintain fitness for purpose.

During the site walkthrough, all chemical storages were checked, according to their requirements (IBCs, cylinders, 15 kg bags, stored in labelled building etc. with chemicals stored in locked buildings that were notably clean and tidy). Five out of five chemicals passed the test. Considered compliant.

In addition, all laboratory chemicals were subjected to the following test:

- > Use by date is clearly visible and the chemical is within date (laboratory chemicals).

Sixteen out of sixteen laboratory chemicals passed the test. Considered compliant.

A sample size of each treatment chemical was taken comprising the following: Lime, Cationic coagulant (cationic poly), Coagulant aid (non-ionic poly), Fluoride, Chlorine. Two tests were applied:

- > 1) The chemical is stored appropriately to maintain fitness for purpose.
- > 2) Current SDS (5-year currency) is found in the expected location.

Five out of five chemicals passed test 1 and test 2. Considered compliant.

Element 5 Verification of drinking water quality

C 5.1 Drinking water quality monitoring (Compliant minor shortcomings)

The monitoring plan was updated based on the stated process of review post the annual risk review outcomes (evidence of review noted in the document history information (Version 2. Change to new template and update based on annual risk update). The process of updating the monitoring program after the annual risk review is considered noteworthy. The process states that monitoring reliability is partly assured through use of a NATA accredited laboratory. The use of a NATA accredited laboratory was confirmed to be in place in practice through evidence provided to confirm use and currency of the laboratory's status. The implementation of the stated practice of using EnviroSys for collation and analysis of data was sighted at interview and in the data requested as part of the sampling and testing process in this audit. Currency of certification of the provider was also taken as evidence of implementation of assurance of appropriate training and competency of personnel.

Implementation was also checked by requesting a sample of monitoring records from December, March and June in the audit date scope. Hunter Water volunteered several missed samples (3 from one service provider relating to amoebae tests for Allyn River, Paterson River and Gresford CWT and a raw water pesticide data upload from another provider). Several outcomes are of note for this scenario:

- > The missed samples were identified 8 months later by Hunter Water, not within a reasonable timeframe of the scheduled sample collection.
- > The service provider did not inform Hunter Water of the missed samples (until an investigation was requested).
- > The missed upload was picked up by Hunter Water because it had identified the missing sample in the EnviroSys dataset.

Measures have been put in place by the service providers to prevent a recurrence. The Monthly Water Quality Summary Reporting Procedure.DOC (HW2009-654/5/12.006 Version 3.3 08/06/2021) includes a requirement to check the actual values but it is not clear if a check is also required of sample numbers. Additional clarification was provided by Hunter Water – summarised as follows: Hunter Water noted that it has assurance processes in place including the laboratory services contractor who is required to manage sampling within a system called GEL. GEL manages verification sampling including notification of uncollected samples. A monthly water quality verification sampling report is also received by Hunter Water which states the number of samples collected. Hunter Water's Operations group review this information including checking against scheduled samples. Regular auditing of the laboratory services provider is undertaken as an extra preventative measure.

Given the clarification, the rectification measures, that only one sample was missing from the pesticide dataset (but later uploaded) and the other missing samples were for the amoebae investigation project, this gap is considered a minor shortcoming with a recommendation to improve the sampling compliance review process. Hunter Water proposed that a practical way to improve the process would be to strengthen existing reporting lines to the water quality committee to include comparison of the network verification sampling completed and scheduled. This proposed approach was accepted by the auditor and the recommendation re-drafted.

C 5.2 Consumer Satisfaction (Compliant)

Customer complaints records were sampled from the Assets Operations Maintenance System (AOMS) for the months of January, June and August (as available) for the Gresford and Lemon Tree Passage systems. Two water quality-related complaints were provided for 12 June 2021 and 07 January 2021. Records confirmed that the complaints were recorded and followed up to completion in practice. Records and other

evidence sighted in Element 7 were taken as evidence of training and awareness in water quality protection, including customer awareness and responses.

C 5.3 Short-term evaluation of results (Compliant)

Records of operational review of operational monitoring results were confirmed at the Lemon Tree Passage water treatment plant site visit (3 November 2021). Customer satisfaction review was confirmed through sighting of data dashboards at the interviews (2 November 2021). Evidence sighted and commented on in other elements, relating to the review by the Water Quality Committee, also confirmed that short-term evaluation of water quality and customer complaints occurs in practice. The process is considered sound.

Evidence gathered under Element 10 confirms that reporting of water quality results to external agencies occurs in practice.

C 5.4 Corrective responses (Compliant)

Evidence reviewed under Elements 4, 6 and Recommendation 2020-01 confirm that the processes for corrective responses in relation to customer feedback are undertaken in practice.

Element 6 Management of incidents and emergencies

C 6.1 Communication (Compliant minor shortcomings; Recommendation 2021/3.1.2-1)

While the information on key stakeholders, agencies and businesses is comprehensive, two key stakeholders, MidCoast Council and Central Coast Council, are not included in the Key Emergency Services and Stakeholder Contact List in the Corporate Emergency Plan (p42) but are covered as stakeholders in Table 1-2 of the DWQMSM (p6). Considered a shortcoming as although both stakeholders are key customers of drinking water services and in Central Coast Council's case, also a provider of drinking water through the bi-directional transfer pipeline, they are covered elsewhere in documentation. Therefore, the deficiency does not impact on Hunter Water's ability to meet obligations or assure processes and outcomes.

Meeting minutes sighted confirmed the NSW Health liaison process (2 June 2021, ACTION 2021-06-02).

The Your Voice web page was checked and confirmed as part of reviewing the stated requirement (for media and communications protocols to be in place) as well as sighting of documentation in place at the site visit.

Table 4-18 (p35) of the DWQMSM and Section 2.6.1 of the DWQMP (p27) cover the process for having a dedicated community team and liaison responsibilities. Hunter Water has overall responsibility for liaison and is informed by the treatment operations contractor (through the formalised processes in the Incident and Emergency Management Manual MAN-2799 and PRO-2803-1 Dated 15/01/2019 (within 3-year cycle of currency) where Section 11, p11 covers communication with the media). Section 10.6 of the Corporate Emergency Management Plan (p25) covers Communications Coordinator Role and Responsibilities. No incidents of a level requiring liaison with the media occurred in the audit date scope therefore no records were available for confirmation.

C 6.2 Incident and emergency response protocols (Compliant; OFI 2021/3.1.2-4)

Records were requested of the four incidents occurring in the audit date scope, to confirm that incident and emergency protocols were followed.

The incidents had been recorded in Integrum according to the stated process and records were available for all incidents. There were no root cause analyses (RCA) undertaken as the incidents occurring within the audit period did not trigger this requirement. It is not typical to undertake RCA for lower level incidents and therefore, this is the reason the RCA was not recorded on the Integrum records (see minor shortcoming below). Follow up by the treatment operations contractor was sighted for the incident occurring at Lemon Tree Passage WTP. Considered compliant.

This criterion was assessed in light of the recommendation 2020-01. Key staff have been taken through awareness sessions (18 and 28 June 2021) for incident reporting and documentation. The training material reviewed was comprehensive and included awareness notes throughout to focus the attention on key points. At interview it was confirmed that awareness was checked after the training through a discussion - there was no formal assessment as such. As an observation, the Corporate Emergency Management Plan screenshot used in the training material was Version 10 March 2021 whereas the document reviewed as part of this audit was dated June 2021 - given the training was undertaken in June, it is unclear why the older version had been used. It is unlikely to present a material issue for the purposes of assessing this clause, and the recommendation, as the document history notes that only a minor revision occurred. Considered compliant.

The following notations were provided as evidence of updating procedures / protocols in response to an incident:

Gresford Raw Water Quality Challenges

- > Reduced duration of auto shutdown alarm for chlorine residual at the Clear Water Tank Outlet from 15 minutes to 10 minutes (now set at <0.4 mg/L for 10 minutes).
- > Updated the CCP response plan troubleshooting checklist to include tablet dosing as a potential action prior to restarting the plant in the event of a primary disinfection CCP alarm.
- > Implemented an additional SCADA notification for operators at Gresford WTP in the event of Clear Water Tank Outlet chlorine residual being less than 0.2 mg/L prior to plant start-up, "WARNING, DO NOT START PLANT DUE TO LOW CT. PLEASE CONTACT MANAGER BEFORE STARTING PLANT". These were confirmed with supplementary evidence provided. It may however be useful to consider adding a reason for the change (if not already done) e.g. clearly showing the incident number or other in the document history.

Element 7 Employee awareness and training

C7.1 Employee awareness and involvement (Compliant)

Records were available to confirm that training is undertaken in practice. Of particular focus for this audit, NSW Health requested the auditors review the implementation of a training program of hygienic pipe installation and repairs along with a reservoir inspection program which includes a phone app for reporting in the field as well as review how it had been incorporated into CCP management (given the importance of reservoir management for maintaining public health outcomes). The additional training requirement, along with induction and a requirement for current drinking water quality policies to be present at sites, represents a sound process for maintaining a continued awareness of water quality management. One shortcoming was noted relating to a requirement to only report on holes >20 mm in reservoir roofs, when all holes are potential pathways for entry of contamination. This aspect has also been captured in the asset clause with a recommendation that the checklist for reservoir inspections be updated to ensure that any holes/ gaps in the roof are addressed (rather than just >20mm). This aspect has been captured in Element 7.2.2 in terms of compliance. The training materials for reservoir maintenance show why reservoir maintenance is an important barrier in public health protection so even though Hunter Water does not categorise reservoirs as CCPs, the inspection process is comprehensive and would meet the requirements for a CCP (Circular LWU 18 and <https://www.health.nsw.gov.au/environment/water/Pages/critical-control-points.aspx>). The process itself is considered compliant.

C7.2 Employee training (Compliant)

Interviews at the Lemon Tree Passage WTP site visit confirmed that a mentoring approach is undertaken in practice (e.g. the operators confirmed support from their senior manager and the operator was able to talk about their training and experiences within the treatment operations contractor organisation - which supported a mentoring and inclusive approach). Considered sound. Currency of NATA certification was confirmed ((noting that an email confirming continuance of microbiological accreditation was sighted as outside of the audit date scope (23/11/2021) but confirms ongoing accreditation)).

Table 4-21 (p38) of the DWQMSM and Section 2.72 (p29) of the DWQMP cover the requirement to keep records of training. For the purposes of this audit, a focus was placed on records to support the NSW Health requirement to review reservoir hygiene training and incident management awareness training. Both were found compliant.

C 9.1 Investigative studies and research monitoring (Compliant)

Information sighted in other elements (including Element 12) confirms that improvements and innovations, as described in the process, are captured and implemented in practice.

C9.2 Validation of Processes (Compliant)

Monthly results are reviewed at the water quality committee meetings (minutes sighted - only the August 2021 minutes noted here but other months sighted in other elements) and actions identified where further analysis / validation is required. Information reviewed for Elements 2 and 3 confirm that performance of process trains is also reviewed through that process. Considered compliant.

C9.3 Design of Equipment (Compliant)

The process described in C9.3 was reviewed for implementation. A building and development web page (as part of the Hunter Water web framework includes building and asset information requirements for external

parties. Information reviewed for Elements 2 and 3 confirm that performance of process trains is also reviewed through that process. Considered compliant.

Element 10 Documentation and reporting

C10.1 Management of documentation and records (Compliant minor shortcoming)

The Hunter Water DWQMS intranet and Asset Operation Framework intranet pages for documenting, recording and retrieval of water quality pertinent information, were sighted at interview. Storage and retrieval of information was confirmed at interview by requesting random samples from many of the systems claimed as meeting the requirements of this component (e.g. EnviroSys, intranet and TRIM). Employees responsible for the specific information were able to easily and quickly locate information, even from areas with which they were not as familiar. Considered compliant.

Section 4.7.1 of HW2013-421 22.002 Standard - Integrated Management System Document Management, states 'When a controlled document is going through the review and approval process it should be transferred to the latest document template.' This aspect was confirmed by review of the DWQMSM transfer to the new template (among other documents). The document was within its review conditions.

A series of documentation was reviewed and checked for currency and against requirements of the IMS standard HW2013-421 22.002. A number of documents have some minor issues such as typographical errors and errors in footers. There were no currency non-conformances of critical documents such as CCP tables or incident and emergency management documentation apart from at the site visit, the controlled copy information was blank, for the Incident and Emergency Manual but otherwise, the manual, and a sample of documents checked within the manual, were all current.

Hunter Water volunteered that the Integrum system has a known issue of overwriting footers - and this is currently being addressed. Management review meeting minutes were checked and confirmed that data cleansing is recognised as required and is in progress. There are many overdue documents which is why Hunter Water has put a non-conformance on itself. Because the critical documents checked were current, implementation of the system in practice, from a drinking water perspective, is considered compliant with a minor shortcoming. However, there needs to be a focus on improving the implementation of currency requirements, before the document control function impacts on critical documents, and becomes material.

There is no recommendation for this identified shortcoming because it can be managed through the recommendation for the quality clause and Hunter Water already has a process in place for managing this risk.

Noteworthy Observation: Raising a self-initiated shortcoming against the identified systemic document control risks is noteworthy because it demonstrates a sound culture for improvement, implemented in practice.

C10.2 Reporting (Compliant)

Reports requested as samples confirmed that the reporting process occurs in practice. Implementation of annual reporting for the audit date scope was confirmed through review of Hunter Water's website.

Element 11 Evaluation and audit

C11.1 Long-term evaluation of results (Compliant)

Reports reviewed under Element 10 and documentation used as evidence for Elements 2 and 3, confirm the process is implemented in practice.

The Annual Compliance and Performance Report to IPART was reviewed and confirms the inclusion of water quality management system performance. Confirmation that the responsibility for evaluation, documentation and reporting of long-term water quality data is implemented in practice was provided through the risk assessment briefing and summary reports reviewed in Elements 2 and 3 and is considered sound.

C11.2 Audit of drinking water quality management (Compliant)

An internal audit of Gresford and Lemon Tree Passage water treatment plant was required by March 2021 and undertaken April 2021 (HW2015-1343 24 3.007). This timeframe is considered acceptable and confirms implementation in practice. Further evidence provided as part of reviewing the quality clause confirms the implementation of external audits.

Review of the water quality minutes was confirmed by undertaking a sample check of communication of audit results for the August and September 2021 meetings. Confirmed as compliant.

Element 12 Review and continual improvement

C12.1 Review by senior executives (Compliant)

A series of evidence was checked and confirms that the process is implemented in practice, in particular, the evidence provided in MRM-2021-04-26 as part of auditing the operating licence quality clause.

Evidence sighted confirmed that both the drinking water quality policy and quality policy (which supports correct operation of overall organisational management systems which underpin the water quality framework) had been reviewed including inputs sought from across the business. Considered compliant.

The outcome of the senior executive review is being documented and communicated to all employees.

IMS meeting minutes are documented (26/04/2021 minutes sighted) and communicated e.g. the Drinking Water Quality Management System Coordinator communicates relevant changes to the Drinking Water Quality Team and treatment operations contractor where relevant. The change management for the Watershed process demonstrated this requirement within the audit date scope (as noted at interview, Hunter Water is moving to the use of Watershed to improve management and documentation of risks). Considered compliant. Water quality representation on the IMS review was also confirmed.

The Asset Creation Framework was sighted in action - 'Safe and Reliable Water Services Strategic Case July 2019 (22/07/2019) (out of audit date scope but outcomes were relevant for the scope). Investment committee meeting minutes and water quality risk management update minutes confirm that a process for programming capital, operational and procedural improvements is implemented in practice. Considered compliant.

C12.2 Drinking water quality management improvement plan (Compliant; OFI 2021/3.1.2-2)

The Drinking Water Quality Improvement Plan is present, current and covers a variety of aspects relating to water quality improvements. Considered compliant.

The Drinking Water Quality Improvement Plan (DWQIP) covers improvement actions identified from risk assessments. Other sources of risk such as CCP exceedances and incidents are used as inputs for the risk assessment review (confirmed in Elements 2 and 3) and are therefore covered through that process, although not specifically stated. Considered compliant.

Several categories are used for tracking status. These categories were used as a basis to pick the sample (a square root of the total for the audit date scope, which was 37 and therefore, 6 items were chosen as follows: 2 at 'risk', 3 'complete', 1 'on hold' and 1 'on track'. The actions have clear information on origin, relevance, status and close out. Considered compliant. There is an opportunity to improve the closure of the risk loop by adding another column to the improvement plan to track outcomes of the risk mitigation.

Senior executive staff report progress against actions in the drinking water quality management improvement plan to all employees (as noted in Element 10).

Recommendations

Recommendation 2021/3.1.2-1: By 30 June 2022, include MidCoast Council and Central Coast Council in the Key Emergency Services and Stakeholder Contact List Corporate Emergency Plan p42, (PA-DW-003-HW2007-900 27 19.003 Corporate Emergency Management Plan June 2021.docx).

Recommendation 2021/3.1.2-2: At the next risk review, ensure that the risk assessments capture a corresponding risk treatment for medium controlled risks and above, within the risk register itself.

Recommendation 2021/3.1.2-3: By 1 November 2022, review CCP Limit Tables and ensure that the limits and the logic are accurate and match SCADA.

Recommendation 2021/3.1.2-4: By 1 November 2022, update the network chlorinators CCP information to include the currency information, according to the stated process.

Recommendation 2021/3.1.2-5: By 30 June 2022, ensure that operators are trained to complete all components of the site checklists (noting that the calibration component was missing from two of the samples viewed at the Lemon Tree Passage site visit, 3 November 2021).

Recommendation 2021/3.1.2-6: By 30 September 2022, strengthen existing reporting lines to the water quality committee to include comparison of the network verification sampling completed and scheduled.

Opportunities for Improvement

OFI 2021/3.1.2-1: Consider formalising the position of the flow diagram authorising party and not just documentation of the name of the authorising party.

OFI 2021/3.1.2-2: Consider improving the improvement record process through documentation of closure of the risk loop e.g. by adding another column to the improvement plan to track outcomes of the risk mitigation.

OFI 2021/3.1.2-3: Given the current operating environment (COVID), consider scheduling calibration checks to provide a buffer for contingency of availability of technicians.

OFI 2021/3.1.2-4: To improve governance for document changes post an incident, consider adding a reason for the change e.g. clearly showing the incident number or other in the document history or meta data.

Clause 3.2 – Recycled water

Clause 3.2.1

Table 3-6 Clause 3.2.1 compliance grade

Subclause	Requirement	Compliance grade
3.2.1	<p>Hunter Water must maintain a Management System for Recycled Water that is consistent with the Australian Guidelines for Water Recycling, except to the extent that NSW Health specifies otherwise in writing (the Recycled Water Quality Management System).</p> <p>[Note: It is expected that the Recycled Water Quality Management System will be consistent with the Australian Guidelines for Water Recycling, including the Framework for Management of Recycled Water Quality and Use. However, where NSW Health considers it appropriate, the application of the Australian Guidelines for Water Recycling may be amended or added to, to take account of Hunter Water's circumstances and/ or Recycled Water quality policy and practices within New South Wales.]</p>	Compliant (minor shortcomings)
Risk	<p>The risk posed to public health and the environment from non-compliance with this clause could be significant.</p>	<p>Target for full compliance</p> <p>Systems and processes in place to identify the requirements of the Australian Guidelines for Water Recycling in Hunter Water's context, a system, document or other which meets the intent of a Recycled Water Quality Management System and evidence to show how these requirements have been maintained</p>

Summary of reasons for grade

Hunter Water has demonstrated that it has managed and maintained a Recycled Water Quality Management System, apart from shortcomings in the following areas:

- > Table 2.1 of the Corporate RWQMP does include residential use as an intended use for recycled water from the Morpeth and Farley WWTWs. Both schemes provided water for residential use during the audit period.
- > The process for providing annual reports on recycled water to end users is not documented or clearly communicated to each end user.
- > The Corporate RWQMP reflects changes to the process for scheduling internal audits of RWQMPs as part of the IMS but does not describe how the scope of the audits is determined and how the audit recommendations are actioned and tracked.

We have seen sufficient evidence to confirm that the requirements have been met apart from shortcomings identified, which to date have not compromised the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.

This clause is graded Compliant (minor shortcomings).

Discussion and notes

Hunter Water manages its recycled water through a hierarchy of documents supported by its integrated management system (IMS). The Recycled Water Quality Management Plan - Corporate (HW2008-1592/20/22.001, v12, dated 12/10/21) is a roadmap for their recycled water management system and provides the overall corporate management framework relevant to Hunter Water's operational recycled water schemes. The Corporate Recycled Water Quality Management Plan (RWQMP) is structured according to the elements, components and actions set out in the Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 1) (AGWR) 'Framework for management of recycled water quality and use' (AGWR Framework). The Corporate RWQMP is supported by scheme specific RWQMPs. During the audit, we focused on documentation for Kurri Kurri and Cessnock Wastewater Treatment Works (WWTW); with the Recycled Water Quality Management Plan – Kurri Kurri WWTW (HW2008-1592/20/29.001, v4, dated June 2019) and the Recycled Water Quality Management Plan – Cessnock WWTW (v5, dated October 2021) provided as evidence.

In considering the 'maintain' requirement of this clause, we have audited the water quality management system against the requirements of the AGWR Framework. The audit scope was for Elements 1 to 6 and 9 to 12 of the Framework.

Element 1: Commitment to responsible use and management of recycled water quality

Responsible use of recycled water

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to maintain a system to involve agencies (i.e. stakeholders) with responsibilities and expertise in protection of public and environmental health and ensure that design, management and regulation of recycled water schemes is undertaken by agencies and operators with sufficient expertise.

Table 1-1 of Hunter Water's Corporate Recycled Water Quality Management Plan (RWQMP) lists stakeholders common to all recycled water schemes. Section 1.3.1 of the Kurri Kurri and Cessnock RWQMPs describe additional stakeholders specific to those schemes.

Stakeholders are reviewed and updated during review of the RWQMPs.

Hunter Water engages with these stakeholders on recycled water through the following:

- > Annual recycled water customer site visits
- > Regular communication with recycled water customers
- > Recycled water agreements with end users
- > Quarterly meetings with NSW Health
- > Review of significant changes by relevant agencies where required
- > Minor changes communicate through the annual report
- > Four yearly review and update of the RWQMP.

Hunter Water ensures key staff involved in the operation of recycled water schemes have the required skills by including recycled water requirements in their position descriptions.

PN102 Operator Competency (HW2013-215-11, v1.0, dated September 2013) requires Veolia Water Operations (treatment operations contractor) to ensure operators are trained and competent.

Regulatory and formal requirements

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to identify and document all relevant regulatory and formal requirements, identify governance of recycled water schemes for individual agencies, designers, installers, operators, maintainers, owners and users of recycled water, ensure that responsibilities are understood and communicated to designers, installers, maintainers, operations employees, contractors and end users and review requirements periodically, to reflect any changes.

Table 1-3 of Hunter Water's Corporate Recycled Water Quality Management Plan (RWQMP) lists regulatory and formal requirements common to all recycled water schemes. Table 1-1 of the Kurri Kurri and Cessnock RWQMPs have requirements that are specific to that scheme.

The *Procedure – Managing Legal and Other Requirements* (HW2012-441/23/1.029) provides information on accessing legislative requirements, ensuring changes are reported to key staff, updating the register and determining how changes affect Hunter Water

The *Quality Register – Legal and Other Requirements* was provided and identifies legislation and standards related to recycled water

Position descriptions for key staff involved in recycled water include requirements to comply with legislation and guidelines including AGWR and the RWQMPs. Position descriptions were provided for:

- > Manager Network Operations
- > Manager Wastewater Treatment Operations
- > Team Leader Alternative Water

Partnerships and engagement of stakeholders

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to identify all agencies with responsibilities for water resources and use of recycled water; regularly update the list of relevant agencies, establish partnerships with agencies or organisations as necessary or where this will support the effective management of recycled water schemes, identify all stakeholders (including the public) affecting, or affected by, decisions or activities related to the use of recycled water, engage users of recycled water; ensure responsibilities are identified and understood, develop appropriate mechanisms and documentation for stakeholder commitment and involvement.

Hunter Water have the following in place to engage and establish partners with stakeholders

- > Key stakeholders are identified in Hunter Water's Corporate, Kurri Kurri and Cessnock RWQMPs
- > Hunter Water have customer agreements with each recycled water end user and hold annual site meetings with each customer as well as informal and formal communications as required (customer agreements for Kurri Kurri and Cessnock provided as evidence)
- > Hunter Water engage with NSW Health through the quarterly liaison meetings. Minutes of Liaison Meetings held on 2/12/2020, 2/3/2021 and 2/6/2021 were provided as evidence.
- > Hunter Water review each RWQMP every 5-years

Position descriptions for key staff involved in recycled water include requirements to engage and develop relationships with key stakeholders including regulators and recycled water customers.

Recycled water policy

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to develop a recycled water policy, endorsed by senior managers, to be implemented within an organisation and ensure that the policy is visible and is communicated, understood and implemented by employees and contractors.

Hunter Water's Recycled Water Policy (v4.0, dated 10/11/2021) outlines the strategic intent relating to recycled water and the obligations of all managers and employees. The policy was updated on 10/11/2020. It is implemented through the Corporate RWQMS. The policy meets the requirements of the AGWR.

Element 2: Assessment of the recycled water system

Intended uses and source of recycled water

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to identify sources of water, identify intended uses, routes of exposure, receiving environments, endpoints and effects and consider inadvertent or unauthorised uses.

Section 2.2.1 of the Kurri Kurri and Cessnock RWQMPs identify sources of wastewater for each scheme. Trade waste is limited to small commercial customers and there are no major trade waste customers. Individual trade waste customers are therefore not identified which is considered appropriate. The Kurri Kurri and Cessnock risk assessment reports provide more detail on trade waste volumes.

Table 2-1 of the Kurri Kurri and Cessnock RWQMPs describe the intended, and potential non-intended, uses of recycled water at each customer site. Table 2-1 of the Corporate RWQMP shows end uses for all recycled water schemes. A minor shortcoming (recommendation 2021/3.2.1-1) is that this table does not identify residential use for Morpeth and Farley WWTWs which supplied the dual reticulation schemes at Gillieston Heights, Chisolm and Thornton North during the audit period. The Chisolm and Gillieston Heights Recycled Water Schemes HACCP Report (Rev. 6, dated 8/8/2021) and the Thornton North Connection to Existing Chisolm Dual Reticulation Scheme – Briefing Paper (dated 29 September 2020) show that residential use has been considered for these schemes. The Corporate RWQMP is currently revision 12 dated 12/10/2021. Revision 11 dated September 2019 states it was updated to incorporate Chisholm and Gillieston Heights.

The Kurri Kurri and Cessnock risk assessment reports also identify routes of exposure and different groups that could be exposed as well as the health and environmental hazards and causes of inadvertent or unauthorised uses.

Target log reduction values have been developed based on the routes of exposure and the AGWR, and are provided in Table 2-1 of the Kurri Kurri and Cessnock RWQMPs.

Recycled water system analysis

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to assemble pertinent information and document key characteristics of the recycled water system to be considered, assemble a team with appropriate knowledge and expertise, construct a flow diagram of the recycled water system from the source to the application or receiving environments and periodically review the recycled water system analysis.

Table 2-3 of the Kurri Kurri and Cessnock RWQMPs includes the team involved in the risk assessments. The team is also provided in the risk registers. The team included representatives of NSW Health, NSW EPA, Hunter Water and Veolia.

The Kurri Kurri and Cessnock RWQMP include an overall block flow diagram from catchment to end user prepared by Hunter Water (Figure 2-1 in each RWQMP). A more detailed flow diagram of the treatment process is also included and was prepared by Veolia (Figure 2-2 in each RWQMP).

Assessment of water quality data

Other than a minor shortcoming, Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to assemble historical data about sewage, greywater or stormwater quality, as well as data from treatment plants and of recycled water supplied to users; identify gaps and assess reliability of data; and assess data (using tools such as control charts and trends analysis) to identify trends and potential problems.

A summary of recycled water quality at the point of supply to each customer is provided in Table 2-5 of the Kurri Kurri and Cessnock RWQMPs.

An internal memo titled Recycled Water – Water Quality Data Analysis Methodology, for Recycled Water Quality Risk Assessments (HW2008-1595.067, dated 24/9/2020) provides a data analysis methodology to be undertaken as part of recycled water risk assessments. There is an opportunity for improvement as this procedure is not referenced in the Corporate, Kurri Kurri or Cessnock RWQMPs (OFI 2021/3.2.1-2). The requirements for data analysis included in the memo are appropriate.

Hazard identification and risk assessment

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to:

- > Define the approach to hazard identification and risk assessment, considering both public and ecological health
- > Periodically review and update the hazard identification and risk assessment to incorporate any changes
- > Identify and document hazards and hazardous events for each component of the recycled water system
- > Estimate the level of risk for each identified hazard or hazardous event
- > Consider inadvertent and unauthorised use or discharge
- > Determine significant risks and document priorities for risk management
- > Evaluate the major sources of uncertainty associated with each hazard and hazardous event and consider actions to reduce uncertainty, apart from minor shortcomings identified with inconsistencies across risk documentation.

Hunter Water schedules risk reviews based on a risk assessment review calendar agreed with NSW Health at the quarterly meetings. Each site is reviewed approximately every 5 years or when there is change to the preventative measures or intended use. A screenshot of the risk assessment calendar was provided as evidence of the schedule. Minutes of the Hunter Water-NSW Health quarterly liaison meetings on 2/12/2020, 3/3/2021 and 2/6/2021 show discussion on upcoming risk assessments for Dungog and the dual reticulation schemes.

The Corporate RWQMP defines the methodology for identifying hazards and quantifying risks using the Enterprise Risk Management (ERM) framework.

Hunter Water has a Guideline – Catchment to Tap Risk Assessment for Drinking Water Quality, which describes how to undertake the system review, water quality analysis, prepare the briefing paper and assess the risk. There is an opportunity for improvement to develop an equivalent procedure for recycled water to ensure that Hunter Water's consultants undertake risk assessments consistently and to the required standard (OFI 2021/3.2.1-3).

Element 3: Preventive measures for recycled water management

Preventive measures and multiple barriers

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to:

- > Identify existing preventive measures system-wide for each significant hazard or hazardous event, and estimate the residual risk
- > Identify alternative or additional preventive measures that are required to ensure risks are reduced to acceptable levels
- > Document the preventive measures and strategies, addressing each significant risk

Existing preventative measures and barriers are developed during the risk assessment processes and documented in the RWQMPs and risk assessment spreadsheets for each scheme. The preventative measures from risk assessments were shown in Section 2.4.2 of the Kurri Kurri and Cessnock RWQMPs. The risk register for dual reticulation undertaken on 26/04/2021 was also provided and included preventative measures for each hazard.

Preventative measures at the customer sites are detailed in the recycled water customer agreements. The agreement for Kurri Kurri Golf Club includes requirements to identify potable and recycled water pipes, prevent cross connections, maintenance and repairs, signage and restrictions on irrigation during public access and weather.

Additional preventative measures that are identified in the risk assessment are added to the recycled water improvement plan.

Critical control points

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to assess preventive measures throughout the recycled water system to identify critical control points, establish mechanisms for operational control and document the critical control points, critical limits and target criteria.

Section 3.2 of the Kurri Kurri and Cessnock RWQMPs identify critical control points, their limits, target performance levels and corrective actions. The basis for critical control points is documented in the risk assessment briefing papers.

Veolia send daily reports to Hunter Water with the last 24 hours of CCP alarms for all wastewater treatment sites. Veolia also send monthly summary reports to Hunter Water on CCP alarms.

Element 4: Operational procedures and process control

Operational procedures

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to identify procedures required for all processes and activities applied within the whole recycled water system (source to use) and document all procedures and compile them into an operations manual.

Operational procedures are documented in TRIM and Veolia's Hunter Water Portal,

Procedures relevant to the treatment plants and product water tanks located within the treatment boundary are prepared and managed by Veolia. The procedures are located within the plant operating manuals. The Plant Operating Manual - Kurri Kurri WWTW (MAN-2967-2m, dated 15/9/2021) and the Plant Operating Manual -Cessnock WWTW (MAN-2957-2), dated 7/9/2021) were provided as evidence.

Procedures existed for operation of each process unit, isolations for maintenance, plant start-up/shutdown, sampling equipment inspection and maintenance of online instruments.

The procedures were considered adequate to cover all aspects of the Kurri Kurri and Cessnock WWTWs.

As part of the Farley WWTW dual reticulation system, Hunter Water have repurposed a 300mm recycled watermain in Chisolm for potable water. The colour of this pipe is therefore still lilac. A screenshot of Hunter Water's GIS system was provided and clearly marked that his pipe is repurposed. Hunter Water's Work Instruction 001 – Working on Potable Water Mains and Fittings (HW2013-421/6.096, v4.0, dated 9/5/2019) requires Dial Before You Dig (DBYD) be contacted before excavation in all circumstances. The control measures to manage maintenance on this pipe are considered adequate.

Operational monitoring

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to develop monitoring protocols for operational performance of the recycled water supply system, including the selection of operational parameters and criteria, and the routine analysis of results and document monitoring protocols into an operational monitoring plan.

The Kurri Kurri WWTW Sampling Guide Sheet (TEM22918, dated 12/06/18) and Cessnock WWTW Sampling Guide Sheet (TEM22910, dated 12/06/18) include process and compliance monitoring. The sampling calendars for each plant show the dates for collection of weekly, monthly and quarterly samples during the audit period.

The Kurri Kurri WWTW SCADA scheme continuously monitors online analytical instrumentation including CCPs and position of valves.

Product water tanks at the dual reticulation plants at Morpeth and Farley are inspected monthly and annually by Veolia using the Reservoir Inspection Form (TEM-12400 HW, dated 24/10/2019). This is the same form used for drinking water reservoirs and is reviewed every three years and due for review in October 2022.

Operational corrections

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to establish and document procedures for corrective action where operational parameters are not met and establish rapid communication systems to deal with unexpected events.

The Procedure – Recycled Water Quality Incident Notification & Response (WR5271, v7, dated September 2019) is applicable to both Hunter Water's Treatment Operations Contractor and laboratory contractor. This plan also includes a table of notifiable events and responses.

The Standard - Recycled Water Quality Monitoring and Communication (HW2008-1592/6/1.019, v4.0 September 2019) provides communication protocols between the Treatment Operations Contractor and Hunter Water. Triggers for recycled water quality and actions are provided for each recycled water scheme.

Equipment capability and maintenance

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to maintain a system to ensure that equipment performs adequately and provides sufficient flexibility and process control and establish a program for regular inspection and maintenance of all equipment, including monitoring equipment.

Schedules for calibrations are accessed through VAMS, the Treatment Operations Contractors asset management systems. The status of monthly schedules for Kurri Kurri and Cessnock WWTWs were provided.

Plant Operating Manual – Kurri Kurri WWTW (MAN- 2967-2) and Plant Operating Manual – Cessnock WWTW (MAN-2967-2) provide instructions for inspections, cleaning and calibration of online instruments for each plant.

Asset management is audited in Clause 4.1.

Materials and chemicals

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to maintain a system to ensure that only approved materials and chemicals are used and establish documented procedures for evaluating chemicals, materials and suppliers.

Approved products list based on the WSAA guidelines for materials and protective coatings for water and sewer is linked from Hunter Water's website.

The Treatment Operations Contractor has work instructions from ordering, delivery and testing of each chemical used at the WWTWs. Work instructions for aluminium sulphate, ferrous chloride, sodium hydroxide and polymer were provided as evidence.

Veolia have specifications for quality of bulk chemicals used at WWTWs and recycled water plants.

Element 5: Verification of recycled water quality and environmental performance

Recycled water quality monitoring

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to establish and document a sampling plan for each characteristic in the distribution system and water as supplied to the customer (including the location and frequency of sampling) and ensure monitoring data are representative and reliable.

The recycled water monitoring plan is provided within each RWQMP and repeated in the Standard - Recycled Water Quality Monitoring and Communication (HW2008-1592/6/1.019, v4.0, dated September 2019). The monitoring tables in the Standard and the Kurri Kurri and Cessnock RWQMPs were reviewed and no discrepancies found.

Samples are collected by either Veolia or the laboratory contractor. Veolia manage their sampling through a guide sheet which defines the frequency and location of each sample and a sampling calendar which defines the date that weekly, monthly and quarterly samples are collected. The Guide Sheet 13 – Kurri Kurri WWTW Sample Monitoring (TEM-2918-1, dated 12/6/2018) and the Kurri Kurri WWTW Sampling Calendar (TEM-2879-4) were reviewed and were consistent the monitoring plan in the Kurri Kurri RWQMP. The Guide Sheet 5 – Cessnock WWTW Sample Monitoring (TEM-2910-1, dated 12/6/2018) and the Kurri Kurri WWTW Sampling Calendar (TEM-2883-4) were also reviewed and were consistent the monitoring plan in the Cessnock RWQMP.

It was noted that the sampling guide sheet states it is to be reviewed 3-yearly and the Kurri Kurri and Cessnock guide sheets were therefore due for review on 12/6/2021. This is discussed further under Element 10.

Samples are analysed by Hunter Water's laboratory contractor (currently ALS). Results that are outside the required limits are automatically emailed to an email group within Hunter Water and Veolia. Veolia record monitoring data in spreadsheets used for creating trends of each parameter. A weekly report is also provided to Hunter Water with tables of each recycled water site analysis highlighting results that are outside the required limits.

Application site and receiving environment monitoring

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to determine the characteristics to be monitored and the points at which monitoring will be undertaken.

Hunter Water manage the required monitoring at external application sites through the recycled water customer agreements. The requirements in the agreements for the customers at Kurri Kurri and Cessnock include:

- > An initial site survey of soil characteristics and potentially affected ground water and local water ways in close proximity to the site
- > Ongoing monitoring of the sites' soil, groundwater and potentially affected local waterways
- > Nutrient, hydraulic and organic load calculations
- > Preparation of a site management plan

Hunter Water undertake annual site visits to each recycled water customer including discussion on monitoring.

Documentation and reliability

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to establish and document a sampling plan for each characteristic, including the location and frequency of sampling, ensuring that monitoring data is representative and reliable as discussed in the Recycled Water Quality Monitoring component above.

Satisfaction of users of recycled water

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to establish an inquiry and response program for users of recycled water, including appropriate training of people responsible for the program.

The Corporate RWQMP stated that Hunter Water reviews recycled water customer satisfaction annually through the annual site visits. Reports are prepared following these visits. The customer agreements also

include a Hunter Water contact. During the audit interviews, Hunter Water advised that the customers have been provided with a group email to contact operations staff.

Hunter Water's call centre can also receive enquiries or complaints about recycled water. Staff in the call centre are trained in recycled water.

The Hunter Water Customer Contract includes descriptions of recycled water and provides contacts for complaints and enquiries.

Short-term evaluation of results

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to establish procedures for the short-term review of monitoring data and satisfaction of users of recycled water and develop reporting mechanisms internally and externally, where required.

The laboratory contractor (ALS) provides immediate notification of any microbiological monitoring exceedances and Veolia provide weekly reports on recycled water quality. The weekly report from Veolia on 8/10/2021 was provided as evidence.

Corrective responses

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to establish procedures for the short-term review of monitoring data and satisfaction of users of recycled water and develop reporting mechanisms internally and externally, where required.

The corrective responses are described in the Corporate RWQMP and the Recycled Water Incident Notification and Response procedure. The requirements of both documents are consistent.

Following any confirmation of exceedances of any trigger values, immediate resampling is required. Depending on the nature of the breach and median results the supply of recycled water may cease and may only recommence with water is back within specification. Two consecutive test results that breach requires notification to NSW Health.

For notifications that do not trigger a formal incident, these are notified to Hunter Water by Veolia as Early Warnings. These are notified to the relevant stakeholders via the recycled water notification group email.

Element 9: Validation, research and development

Validation of processes

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to validate processes to ensure they control hazards effectively and revalidate processes when variations in conditions occur.

Validation of procedures are documented in the scheme specific RWQMPs and the Validation Testing Program for Water Recycling Schemes (v1.3, dated September 2019).

The validation testing program was undertaken for all processes that could not be validated based on pre-validated processes including traditional wastewater treatment technologies (activated sludge, trickling filters etc.) and package treatment units that were not pre-validated. The testing used somatic coliphage for viral pathogens, *C. perfringens* for protozoan pathogens and *E. coli* for bacterial pathogens as surrogates which will provide more log reduction than the target pathogens. The methodology for calculating log reduction values is consistent with the AGWR.

Section 9.1 of the Corporate RWQMP states that new systems are subject to a period of validation monitoring during the commissioning stage and validation monitoring will be repeated when new equipment, controls or procedures are introduced. There is an opportunity for improvement to repeat the validation testing program at frequencies for each process and scheme based on the risk of changes to the LRV over time (OFI 2021/3.2.1-1). For example, membrane filtration LRV may deteriorate as they reach their serviceable life and activated sludge process may have reduced LRV as they become more loaded due to population growth.

Design of equipment

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to validate the design of new equipment and infrastructure to ensure continuing reliability.

Section 9.2 of the Corporate RWQMP states that new equipment or infrastructure is validated prior to implementation and is then documented in the scheme RWQMPs. The Kurri Kurri and Cessnock RWQMPs did not have any new equipment in the reporting period.

Investigative studies and research monitoring

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to establish programs to increase understanding of the recycled water supply system and use this information to improve management of the recycled water supply system.

Section 9.3 of the Corporate RWQMP states that Hunter Water stays aware of broader recycled water issues by maintaining membership of industry bodies including Water Research Australia and the Water Services Association of Australia as well as maintaining connections with other water utilities.

Hunter Water also holds a Quarterly Liaison Meeting with NSW Health where there is a new or emerging issues standing agenda item. Minutes of Liaison Meetings held on 2/12/2020, 2/3/2021 and 2/6/2021 were provided as evidence.

As knowledge gaps are identified Hunter Water reviews their priority to ensure future research is focused on public health and the environment.

An extract from Hunter Water's organisational structure was provided and shows the position of Team Leader Science & Research reporting to the Group Manager Corporate Strategy. During the interviews Hunter Water staff advised this position is responsible for prioritising and coordinating research including recycled water studies.

Element 10: Documentation and reporting

Management of documentation and records

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to document information pertinent to all aspects of recycled water quality management, develop a document-control system to ensure current versions are in use, establish a records-management system, ensure that employees are trained to complete records and periodically review documentation and revise as necessary.

Hunter Water uses Content Manager (formerly TRIM) for the management of records related to recycled water. All staff are trained in record keeping.

RWQMPs are reviewed regularly and the next review date is recorded in the document control table on each document. RWQMPs are reviewed as part of major scheme changes and at least once throughout the term of the Operating Licence (every 5 years).

Veolia manage all documents in an electronic document control system. All documents are reviewed every three years. Critical documents related to the Hunter Water treatment operations contract are provided as links on Veolia's Hunter Water Portal.

Reporting

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to establish procedures for effective internal and external reporting, and produce an annual report aimed at users of recycled water, regulatory authorities and stakeholders.

Veolia produce weekly Recycled Water Summary Reports that are circulated to key Hunter Water and Veolia staff and flags results that require further action. Reviews and audits of management systems are stored in Content Manager and circulated to key staff within Hunter Water.

Hunter Water undertakes the following external communication on recycled water:

- > Quarterly Liaison Meetings with NSW Health
- > Quarterly Drinking Water and Recycled Water Quarterly Exceptions report to NSW Health
- > Annual Compliance and Performance Report (water quality) for IPART and NSW Health
- > National Performance Report (NPR) to IPART and,
- > Annual Information Return to IPART
- > Annual site visit meetings with each recycled water end user.

There is a minor shortcoming that Hunter Water does not have a process to prepare an annual report to end users of recycled water. Hunter Water staff advised that they provide this on request however this process is not documented in the Corporate RWQMP or the recycled water customer agreements provided for Kurri Kurri and Cessnock (recommendation 2021/3.2.1-2).

Element 11: Evaluation and audit

Long-term evaluation of results

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to collect and evaluate long-term data to assess performance and identify problems and document and report results.

Historical recycled water quality results were reviewed as part of the risk assessments for each scheme and are provided in the briefing documents for each scheme. The Corporate RWQMP states that Hunter Water also review the scheme RWQMPs every five years which includes review of emerging issues and trends identified through monitoring results.

As part of the monthly operations meetings between Hunter Water and Veolia, long term data is reviewed and discussed.

Audit of recycled water quality management

Other than a minor shortcoming Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to establish a process for internal and external audits and document and communicate audit results.

Section 11.2.1 of the Corporate RWQMP states that internal audits are periodically scheduled as part of the annual management systems audit programme. During the interviews however, Hunter Water staff have advised that during the reporting period the audit processing has been reviewed and audits of scheme RWQMS are scheduled to audit each scheme every five years. Audits are scheduled as part of the Second Line of Defence (2LOD) in the IMS. Once scheduled, the audits are entered into the Recycled Water Improvement Plan for tracking. There is a minor shortcoming as it was not clear from the documentation or the RWQMS how the AGWR elements to be included in audit scope is determined (recommendation 2021/3.2.1-5).

The RWQMS is also subject to the operational licence audit (this report).

Element 12: Review and continuous improvement

Review by senior management

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements for senior managers review of the effectiveness of the management system and evaluate the need for change.

Section 12.1.1 of the Corporate RWQMP states that the ongoing improvement and review is facilitated through a number of processes including quarterly Hunter Water and NSW Health Liaison Committee Meetings.

Hunter Water have also advised that a Management System Review Meeting is held with the Executive Management Team (EMT) to report on the performance of all management systems.

During the audit period, a restructure to incorporate recycled water management into the Audits, Assurance and Systems Group was undertaken to allow for integrated review of recycled water management. Recycled water is also discussed at IMS management meetings.

Recycled water quality management improvement plan

Hunter Water has provided sufficient evidence to demonstrate it has met the AGWR requirements to develop a recycled water quality management improvement plan and ensure that the plan is communicated and implemented, and that improvements are monitored for effectiveness.

Hunter Water maintain a RWQMS Improvement Plan spreadsheet saved within Content Manager where actions from risk assessments, audits and external stakeholders are entered. Due dates are agreed at the Recycled Water Activities and Compliance meetings. The spreadsheet also includes a dashboard showing upcoming and overdue actions.

The responsible persons are emailed the action and when complete enters the completion date and a link to the evidence of completion added.

The improvement plan is presented to the Hunter Water and NSW Health Liaison Committee meetings.

Recommendations

Recommendation 2021/3.2.1-1: By 31 March 2022, Hunter Water must update Table 2.1 of the Corporate RWQMP to include residential use as an intended use for recycled water from the Morpeth and Farley WWTWs.

Recommendation 2021/3.2.1-2. By 30 June 2022, Hunter Water must document the process for providing annual reports on recycled water to end users and clearly communicate this process with each end user.

Recommendation 2021/3.2.1-3. By 31 March 2022, Hunter Water must update the Corporate RWQMP to reflect changes to the process for scheduling internal audits of RWQMPs including how the scope of the audits is determined and how the audit recommendations are actioned and tracked.

Opportunities for improvement

OFI 2021/3.2.1-1. Develop a schedule to regularly review the validation testing based on the risk of changes to log reduction values over time such as from equipment age or increased hydraulic or organic loading.

OFI 2021/3.2.1-2. Update the Corporate RWQMP to reference Recycled Water – Water Quality Data Analysis Methodology, for Recycled Water Quality Risk Assessments (HW2008-1595.067) under Element 2.

OFI 2021/3.2.1-3. Develop a procedure for undertaking recycled water risk assessment briefing papers including intended and unintended uses, system analysis, water quality assessment, hazard identification and risk assessment. Reference this procedure in the Corporate RWQMP.

Clause 3.2.2

Table 3-7 Clause 3.2.2 compliance grade

Subclause	Requirement	Compliance grade
3.2.2	Hunter Water must ensure that the Recycled Water Quality Management System is fully implemented and that all relevant activities are carried out in accordance with the Recycled Water Quality Management System, and to the satisfaction of NSW Health.	Compliant (minor shortcomings)
Risk	Target for full compliance	
If the Recycled Water Quality Management System is not fully implemented, there is a high risk that Hunter Water may not be able to effectively manage the risk to public health and the environment.	Evidence that the Recycled Water Quality Management System is fully implemented and that all relevant activities are carried out in accordance with the Recycled Water Quality Management System. Evidence to show that NSW Health is satisfied with the implementation of the Recycled Water Quality Management System.	

Summary of reasons for grade

Hunter Water has demonstrated that it has implemented its Recycled Water Quality Management System, apart from shortcomings in the following areas:

- > Recycled water customer agreements for the recycled water customers at Kurri Kurri and Cessnock were renewed after their expiry date and were therefore expired for part of the audit period
- > The process flow diagram for Kurri Kurri WWTW had minor deficiencies when compared with the process during the site visit
- > The procedure for receipt of aluminium sulphate deliveries requires testing of a sample prior to unloading however this is not practiced at wastewater treatment works
- > The Disinfected Effluent UVT limit in the spreadsheet used to present long term trends of Kurri Kurri recycled water quality did not reflect the CCP limit
- > The Dungog Wastewater Treatment Works (WWTW) was upgraded in the audit period and the draft Dungog Recycled Water Quality Management Plan, risk workshop briefing presentation and risk register provided as evidence did not provide any basis for the 4 log reduction in helminths claimed from the membrane bioreactor. It was noted that Hunter Water had discussions with DPIE who were satisfied that the treatment process could achieve the required log reduction and that helminth infections are generally not endemic in Australia

This clause is graded Compliant (minor shortcomings).

Discussion and notes

Hunter Water implements the RWQMP through a combination of Hunter Water operations and maintenance teams and contractors. Veolia Water Operations (VWO) are contracted to operate and maintain the treatment sites generally from the wastewater treatment works inlet to the point of supply to the recycled water customers. Hunter Water retain responsibility for the wastewater collection network (including trade waste) and formal relationships with regulators, customers and other stakeholders. Hunter Water are also responsible for capital upgrades of the treatment assets for increased capacity, asset replacement and to comply with changing standards.

Element 1: Commitment to responsible use and management of recycled water quality

Responsible use of recycled water

Hunter Water has provided sufficient evidence to demonstrate implementation of the Recycled Water Quality Management Plan requirements to involve agencies (i.e. stakeholders) with responsibilities and expertise in protection of public and environmental health and ensure that design, management and regulation of recycled water schemes is undertaken by agencies and operators with sufficient expertise.

Hunter Water provided the following evidence of engagement with these stakeholders on recycled water:

- > Attendance sheet from site tour of Dungog WWTW on 14/5/21 including representatives from NSW Health and the end user (Corrie Farm)
- > Audit of Corrie Farm recycled water management on 14/5/21
- > Quarterly meetings between Hunter Water and the NSW Health Liaison Committee on 2/12/20, 3/3/21 and 2/6/21 accordance with the RWQMP.

A screen shot of end user communication spreadsheet showing phone conversations and formal communication with Cessnock Golf Course, Kurri Kurri TAFE and Kurri Kurri Golf Club during the audit period.

Hunter Water has position descriptions for all key staff involved in the operation of recycled water schemes that include training requirements specific to recycled water and requirements to comply with the RWQMP.

Hunter Water also provided the following from VWO specific to the Hunter Water treatment operations contract:

- > Skills and competency matrix for WWTW operators
- > Extract from the August 2021 monthly report showing progress on training and qualifications
- > Training currency records for operators at Kurri Kurri and Cessnock WWTWs
- > Presentation for training in recycled water awareness specific to Hunter Water.

Regulatory and formal requirements

Hunter Water has provided sufficient evidence to demonstrate implementation of the Recycled Water Quality Management Plan requirements to identify and document all relevant regulatory and formal requirements, identify governance of recycled water schemes for individual agencies, designers, installers, operators, maintainers, owners and users of recycled water, ensure that responsibilities are understood and communicated to designers, installers, maintainers, operations employees, contractors and end users and review requirements periodically, to reflect any changes.

Minutes of quarterly meetings between Hunter Water and the NSW Health Liaison Committee on 2/12/20, 3/3/21 and 2/6/21 were provided.

Position descriptions for key staff involved in recycled water include requirements to comply with legislation and guidelines including AGWR and the RWQMP.

Partnerships and engagement of stakeholders

Hunter Water has provided sufficient evidence to demonstrate implementation of the Recycled Water Quality Management Plan requirements to identify all agencies with responsibilities for water resources and use of recycled water; regularly update the list of relevant agencies, establish partnerships with agencies or organisations as necessary or where this will support the effective management of recycled water schemes,

identify all stakeholders (including the public) affecting, or affected by, decisions or activities related to the use of recycled water, engage users of recycled water; ensure responsibilities are identified and understood and develop appropriate mechanisms and documentation for stakeholder commitment and involvement.

Hunter Water advised they were unable to undertake annual site meetings with recycled water customers due to COVID restrictions. Hunter Water provided evidence of a situation report to staff on 23/3/2020 and 24/3/2020 for non-essential operations staff to work from home and avoid non-essential contact with the community. These instructions were still in force during the audit period.

As Dungog WWTW and its RWQMP were undergoing upgrade, a site visit was conducted with the end user (Corree Farm) on 14/5/21. The attendance sheet and notes from this meeting was provided and representatives of NSW Health and Corree Farm were present.

End user agreements were provided for Cessnock Golf Course, Kurri Kurri TAFE and Kurri Kurri Golf Club, a minor shortcoming identified was that the agreements were expired for part of the audit period (recommendation 2021/3.2.2-1). Table 3-8 shows expiry date for each customer and the date a letter to extend the date was sent to the customer.

Table 3-8 Kurri Kurri and Cessnock recycled water agreements

Customer	Expiry Date	Letter of extension
Kurri Kurri Golf Club	30/6/2020	9/8/2021
Kurri Kurri TAFE	30/6/2021	6/10/2021
Cessnock Golf Club	30/6/2018	6/10/2021

While the agreements were expired, Hunter Water continued to engage with each customer through information and formal communication including ensuring the customers obligations under the agreement were met (e.g. cross connection tests).

A screen shot of the recycled water customer communication spreadsheet showed phone conversations and formal communication with Cessnock Golf Course, Kurri Kurri TAFE and Kurri Kurri Golf Club during the audit period. Email correspondence with Kurri Kurri TAFE between 6/10/21 and 11/10/21 regarding annual cross connection flow tests was also provided.

Minutes of the quarterly meetings with NSW Health on 2/12/20, 3/3/21 and 2/6/21 were provided and included discussion on recycled water quality exceptions and upcoming activities on recycled water systems.

Recycled water policy

Hunter Water has provided sufficient evidence to demonstrate implementation of its Recycled Water Quality Management Plan requirements to develop a recycled water policy, endorsed by senior managers, to be implemented within an organisation and ensure that the policy is visible and is communicated, understood and implemented by employees and contractors.

Hunter Water's Recycled Water Policy outlines the strategic intent relating to recycled water and the obligations of all employees and contractors. The policy was updated on 20/11/2020 and uploaded to Content Manager. It is implemented through the Recycled Water Quality Management Plan.

Hunter Water makes the policy available to all staff via Content Manager and is also provided to the treatment operations contractor to distribute to the recycled water sites. During the site visit to Kurri Kurri WWTW, the latest version of the policy was displayed inside the main entrance to the administration building

It is also publicly available on the Hunter Water [website](#). The version of the policy on the website was the same as the copy provided as evidence.

Element 2: Assessment of the recycled water system

Intended uses and source of recycled water

Hunter Water has provided sufficient evidence to demonstrate implementation of its Recycled Water Quality Management Plan to identify the sources of water, intended uses, routes of exposure, receiving environments, endpoints and effects and consider inadvertent or unauthorised uses.

Review of intended uses and sources of recycled water is undertaken as part of the RWQMP review process. During the audit period the RWQMPs for Dungog WWTW and the dual reticulation systems at Chisolm, Thornton North and Gillieston Heights were scheduled for review. The following evidence was provided that these reviews were undertaken:

- > Dungog WWTW Recycled Water Scheme Update and Recycled Water Quality Management Plan Review presentation (dated 12/2/2021)
- > Chisolm and Gillieston Heights Recycled Water Scheme HACCP Report (v6, dated 8/8/2021)
- > Recycled Water – Thornton North Connection to existing Chisolm Dual Reticulation Scheme – Briefing Paper (dated 29 September 2020)
- > Agenda for Dual Reticulation Risk assessment for meeting on 9/6/2021.

These documents included a description of the intended uses, routes of exposure, environment and inadvertent uses.

Recycled water system analysis

Hunter Water has provided sufficient evidence to demonstrate implementation of its Recycled Water Quality Management Plan to:

- > Assemble pertinent information and document key characteristics of the recycled water system to be considered
- > Assemble a team with appropriate knowledge and expertise
- > Construct a flow diagram of the recycled water system from the source to the application or receiving environments
- > Periodically review the recycled water system analysis.

Risk registers and briefing paper invitations for the Dungog and dual reticulation schemes reviewed in the audit period were provided and recorded the review attendees. This included representatives from NSW Health and Veolia.

During the site visit to Kurri Kurri WWTW, the process flow diagram (Figure 2-3 in the Kurri Kurri RWQMP) was reviewed and the treatment process was generally as shown on the diagram. The following minor shortcomings were found:

- > The third clarifier is not shown
- > Aluminium sulphate and sodium hydroxide dosing prior to the tertiary filters is shown on the diagram. These chemical dosing points have been decommissioned.

While these changes to the treatment process do not change the risks, Hunter Water must ensure the recycled water analysis is reviewed to incorporate any changes that occur (recommendation 2021/3.2.2-2).

Assessment of water quality data

Hunter Water has provided sufficient evidence to demonstrate implementation of its Recycled Water Quality Management Plan to assemble historical data about sewage, greywater or stormwater quality, as well as data from treatment plants and of recycled water supplied to users; identify gaps and assess reliability of data and assess data (using tools such as control charts and trends analysis), to identify trends and potential problems.

Veolia maintains a spreadsheet for each recycled water scheme. These spreadsheets were provided for Kurri Kurri and Cessnock and include automated exceptions for parameters outside operational or critical limits. These spreadsheets are used to produce 12 month rolling trends and each site is reviewed annually in the monthly report between Hunter Water and Veolia on the treatment operations contract. Minutes of the monthly meeting held on 9/2/2021 was provided and showed review of the long-term trends for the Edgeworth recycled water scheme.

The Dungog Recycled Water Risk Workshop Briefing Presentation (dated 12/2/2021) included trends of total suspended solids, *E. coli* and biochemical oxygen demand. The methodology was consistent with the internal memo titled Recycled Water – Water Quality Data Analysis Methodology, for Recycled Water Quality Risk Assessments.

Hazard identification and risk assessment

Hunter Water has provided sufficient evidence to demonstrate implementation of its Recycled Water Quality Management Plan to:

- > Define the approach to hazard identification and risk assessment, considering both public and ecological health

- > Periodically review and update the hazard identification and risk assessment to incorporate any changes
- > Identify and document hazards and hazardous events for each component of the recycled water system
- > Estimate the level of risk for each identified hazard or hazardous event
- > Consider inadvertent and unauthorised use or discharge
- > Determine significant risks and document priorities for risk management
- > Evaluate the major sources of uncertainty associated with each hazard and hazardous event and consider actions to reduce uncertainty, apart from minor shortcomings identified with inconsistencies across risk documentation.

The Dungog WWTW Recycled Water Scheme Update and Recycled Water Quality Management Plan Review presentation, Dungog WWTW risk assessment spreadsheet and memo to NSW Health and Department of Primary Industries on 19/10/2020 was provided as evidence of the risk assessment undertaken in the audit period with the risk workshop held on 12/2/2021. The risk assessment methodology and risk matrix used in this risk assessment is consistent with the methodology in the Corporate RWQMP.

Element 3: Preventive measures for recycled water management

Preventive measures and multiple barriers

Hunter Water has provided sufficient evidence to demonstrate implementation of its Recycled Water Quality Management Plan to identify existing preventive measures system-wide for each significant hazard or hazardous event, and estimate the residual risk, identify alternative or additional preventive measures that are required to ensure risks are reduced to acceptable levels and document the preventive measures and strategies, addressing each significant risk.

The risk registers for Kurri Kurri and Cessnock recycled water schemes were provided as evidence. Residual risk was identified in the risk assessment and additional preventive measures identified.

During the site visit to Kurri Kurri WWTW staff were able to describe preventative measures including CCPs, operational monitoring and balancing of tankered waste delivered to the plant.

Annual site visits to recycled water customers were not undertaken due to COVID restrictions as discussed under Element 1. Evidence was provided of emails between Hunter Water and Kurri Kurri TAFE between 6/10/2021 and 11/10/2021 which included request for evidence of the annual cross connection flow test required in the agreement.

Critical control points

Hunter Water has provided sufficient evidence to demonstrate implementation of its Recycled Water Quality Management Plan to assess preventive measures throughout the recycled water system to identify critical control points, establish mechanisms for operational control and document the critical control points, critical limits and target criteria.

All CCP limits and delays matched the tables in the Kurri Kurri RWQMP. Staff were not able to change the CCP setpoints on SCADA. Staff were able to change the CCP alarm delay setpoints however a review of the event history on these delays showed they had not been changed during the audit period.

Evidence of daily WWTW CCP and EPA Compliance Alarms email on 11/10/2021 and WWTW CCP and EPA Compliance Alarms monthly report on 2/9/2021 was provided as evidence that reporting from Veolia on CCP compliance was undertaken,

Staff were able to access SCADA and demonstrate when the inlet flow exceeded the CCP limit between 14/3/21 and 7/4/21, the alarm was activated and the pumps supplying recycled water to Kurri Kurri TAFE did not operate. Staff were also able to describe protocols for contacting Kurri Kurri Golf Course during CCP exceedances or other recycled water quality issues.

The CCP monitoring instruments and sampling points were not clearly labelled in the field. There is an opportunity for improvement to clearly label CCPs in the field to increase the awareness of operational staff of the importance of CCPs (OFI 2021/3.2.2-1).

Element 4: Operational procedures and process control

Operational procedures

Hunter Water has provided sufficient evidence to demonstrate implementation of its Recycled Water Quality Management Plan to identify procedures required for all processes and activities applied within the whole recycled water system (source to use) and document all procedures and compile into an operations manual.

The process units covered in the Treatment Operations Contractors *Plant Operating Manual – Kurri Kurri WWTW* (MAN- 2967-2) were consistent with those viewed during the site inspection. The opportunities for improvement were found in the process flow diagram within the plant operating manual (OFI 2021/3.2.2-2):

- > Sodium hypochlorite dosing to bioreactor, clarifier, tertiary filters and reclaimed effluent pump station has been decommissioned but still shown on the diagram
- > Alum dosing is shown in the filter lift pump station but is being dosed between the bioreactor and the clarifiers

A training presentation on Recycled Water Dual Reticulation Awareness was also provided and includes reference to the repurposed recycled water pipe at Chisolm. Hunter Water also provided a Dial Before You Dig (DBYD) enquiry on 2/2/21 which shows advice that this is a repurposed pipe.

Operational monitoring

Hunter Water has provided sufficient evidence to demonstrate implementation of its Recycled Water Quality Management Plan to develop monitoring protocols for operational performance of the recycled water supply system, including the selection of operational parameters and criteria, and the routine analysis of results and document monitoring protocols into an operational monitoring plan.

Completed inspection and laboratory log-sheets were viewed during the Kurri Kurri WWTW site visit and were completed to the date of the visit.

Extract from Veolia Asset Management System (VAMS) showed completion of monthly and annual product water tank inspections at Farley WWTW and Morpeth WWTW. Completed Reservoir Inspection Forms using the latest version of the form were provided for the Morpeth product water tank on 3/8/2021, 9/9/2021 and 13 October 2021. All sections of the form were completed and comments entered where applicable.

Operational corrections

Hunter Water has provided sufficient evidence to demonstrate implementation of its Recycled Water Quality Management Plan to establish and document procedures for corrective action where operational parameters are not met and establish rapid communication systems to deal with unexpected events.

Hunter Water advised that there were no CCP exceedances in the audit period for Kurri Kurri or Cessnock WWTW. An example CCP breach on 12/2/2021 was provided for exceedance of the flow CCP at Dungog WWTW. The response complied with Procedure – Recycled Water Quality Incident Notification & Response (HW2008-1592/8/2.062, v7, dated September 2019) including notification to NSW Health on 12/2/2021, entering in to Integrum on 17/2/2021 including a description of the incident and actions taken.

Trends of CCPs for Kurri Kurri SCADA were viewed during the site visit and no exceedances were noted for the audit period. Refer to Element 3 critical control points for details.

The Monthly Recycled Water Effluent Meeting agenda for 9/2/21 was provided and includes items for discussion on recycled water monitoring and references early warning notifications from Treatment Operations Contractor for results outside limits.

Equipment capability and maintenance

Hunter Water has provided sufficient evidence to demonstrate implementation of its Recycled Water Quality Management Plan to ensure that equipment performs adequately and provides sufficient flexibility and process control and establish a program for regular inspection and maintenance of all equipment, including monitoring equipment.

Monthly maintenance records were provided for the Kurri Kurri and Cessnock WWTW. All work orders raised during the audit period were closed.

Instrument inspection work orders were provided for the Cessnock flowmeters and Kurri Kurri UV transmissivity meter.

Completed work orders were also provided for product water tanks at Farley and Morpeth WWTWs

During the site inspection the stickers on the laboratory showed that service was due in September 2021. Veolia staff explained that the process for service of all instruments used on the Hunter Water sites is to deliver them all to a central location and a technician travels from Sydney to undertake the service in one day. Due to COVID travel restrictions this was not able to occur. Staff advised that the service is planned for later in November 2021. The delay in service of these instruments does not represent a risk to recycled water quality as the instruments do not require service every year and weekly and monthly NATA laboratory analysis would indicate a discrepancy if the instrument became out of calibration. The auditor therefore considers it acceptable that servicing of these instruments was not considered essential during COVID restrictions.

More discussion on maintenance is included in Clause 4.1 – Asset management system.

Materials and chemicals

Other than a minor shortcoming, Hunter Water has provided sufficient evidence to demonstrate implementation of its Recycled Water Quality Management System to ensure that only approved materials and chemicals are used and establish documented procedures for evaluating chemicals, materials and suppliers.

A certificate of analysis was provided for sodium hypochlorite (22/7/2021). This was consistent with the requirement set in the technical specification for sodium hypochlorite.

During the site visit to Kurri Kurri WWTW staff were able to explain the procedure for ordering and receiving bulk chemicals. Examples of a delivery docket for ferrous chloride on 11/10/2021 were viewed during the site visit. Sodium hydroxide and ferrous chloride delivery was consistent with the work instructions. For aluminium sulphate staff advised that testing of a sample prior to unloading was not undertaken at wastewater treatment sites. There is a minor shortcoming as the requirement in the Work Instruction for Aluminium Sulphate Solution Ordering, Delivery and Testing (WI-HW-20-7835-1) that a sample for every delivery is tested for pH, specific gravity, temperature as well as visual checks is not undertaken (recommendation 2021/3.2.2-3). These tests are related to the strength of the aluminium sulphate solution and variations would not affect the health requirements of the recycled water and would only have minimal impact on recycled water phosphorus concentrations. Veolia also monitor phosphorus through the plant which is used to adjust the alum and ferrous chloride dosing.

Hunter Water advised that no recycled water assets were constructed during the audit period and there are therefore no records of inspections.

Element 5: Verification of recycled water quality and environmental performance

Recycled water quality monitoring

Hunter Water has provided sufficient evidence to demonstrate implementation of the requirements of their Recycled Water Quality Management Plan to establish and document a sampling plan for each characteristic in the distribution system and water as supplied to the customer (including the location and frequency of sampling) and ensure monitoring data are representative and reliable.

The NATA accreditation for ALS Newcastle of chemical and microbiological analysis were provided and included accreditation for the analysis required in the Kurri Kurri and Cessnock monitoring plans.

All sampling results are recorded by Veolia in the recycled water quality trends spreadsheets. The spreadsheets for Kurri Kurri and Cessnock WWTW were reviewed and all samples were collected and analysed for the parameters in the monitoring plans in the RWQMPs.

The sampling and analysis schedule provided to the laboratory contractor was provided as evidence and was reviewed against the monitoring plan in the Kurri Kurri and Cessnock RWQMPs and no discrepancies were found.

During the interviews, an email from the laboratory contractor (ALS) was sighted to inform Hunter Water about results outside the trigger levels.

Application site and receiving environment monitoring

Hunter Water has provided sufficient evidence to demonstrate implementation of its Recycled Water Quality Management Plan to determine the characteristics to be monitored and the points at which monitoring will be undertaken.

Hunter Water advised they were unable to undertake annual site meetings with recycled water customers due to COVID restrictions. Hunter Water provided evidence of situation report to staff on 23/3/2020 and

24/3/2020 for non-essential operations staff to work from home and avoid non-essential contact with the community. These instructions were still in force during the audit period.

Documentation and reliability

Hunter Water has provided sufficient evidence to demonstrate implementation of its Recycled Water Quality Management Plan (establish and document a sampling plan for each characteristic, including the location and frequency of sampling, ensuring that monitoring data is representative and reliable) as discussed under Element 5, Recycled Water Monitoring section above.

Satisfaction of users of recycled water

Hunter Water advised they were unable to undertake annual site meetings with recycled water customers due to COVID restrictions. Hunter Water provided evidence of situation report to staff on 23/3/2020 and 24/3/2020 for non-essential operations staff to work from home and avoid non-essential contact with the community. These instructions were still in force during the audit period. Hunter Water provided screenshot of correspondence with Kurri Kurri and Cessnock recycled water customers during the audit period.

Hunter Water provided the following evidence of information and training to call centre staff in handling enquiries on recycled water at dual reticulation sites:

- > Recycled Water Quick Guide (HW2013-193/39.023, dated 4/11/2019)
- > Call centre guideline for Recycled Water or Dual Reticulation.

Short-term evaluation of results

Hunter Water has provided sufficient evidence to demonstrate implementation of the its Recycled Water Quality Management Plan to establish procedures for the short-term review of monitoring data and satisfaction of users of recycled water and develop reporting mechanisms internally and externally, where required.

An example of an email from ALS for exceedance of a trigger was provided during the audit interviews.

Veolia's weekly recycled water quality report from 6/10/2021 was provided as evidence. The report includes the last three weeks of monitoring data from each recycled water site and results are highlighted for 50 percentile exceedances, single 90 percentile exceedances and microbiological two-week exceedances. The limits used in this report are consistent with the trigger levels in the monitoring plan in the Kurri Kurri and Cessnock RWQMP and the Recycled Water Incident Notification and Response procedure. Review of Veolia's Kurri Kurri and Cessnock RW quality trends spreadsheet did not show any exceedance of trigger values that were not reporting in the weekly report from 6/10/2021.

Corrective responses

Hunter Water has provided sufficient evidence to demonstrate implementation of its Recycled Water Quality Management Plan to establish and document procedures for corrective responses to nonconformance or feedback from users of recycled water and establish rapid communication systems to deal with unexpected events.

Refer to discussion above in Short-term evaluation of results and Element 3 Preventative Measures

Hunter Water provided Early Warning reports from Veolia to Hunter Water for a CCP breach at Dungog on 13/2/21 and potential CCP breach at Clarence Town on 12/1/2021.

Element 9: Validation, research and development

Validation of processes

Other than minor shortcomings, Hunter Water has provided sufficient evidence to demonstrate implementation of the requirements of its Recycled Water Quality Management Plan to validate processes to ensure they control hazards effectively and revalidate processes when variations in conditions occur.

The Kurri Kurri and Cessnock RWQMPs had log reduction values (LRVs) consistent with the Validation Testing Program for Water Recycling Schemes (v1.3, dated September 2019).

The Dungog WWTW was upgraded during the audit period. The draft Dungog WWTW RWQMP provided to NSW Health on 19/10/2020 and the risk register from the risk workshop on 15/10/2020 (recommendation 2021/3.2.2-4) were provided to us. Both documents state that the membrane bioreactor can achieve a 4-log reduction of helminths. The basis for this log reduction is not provided in either document. Hunter Water

have advised that discussions were held with DPIE who agreed that the treatment process can achieve the required helminth removal. In Australia, helminth infections are generally not endemic (Source: Letter from WSAA to David Cunliffe Chair of the enHealth Water Quality Expert Reference Panel, dated 30 April 2020). This is therefore only considered a minor shortcoming.

There is also a minor shortcoming that the upgraded Dungog plant log reduction values have not been incorporated into the Validation Testing Program for Water Recycling Schemes (recommendation 2021/3.2.2-4).

Design of equipment

Hunter Water has provided sufficient evidence to demonstrate implementation of the requirements of its Recycled Water Quality Management Plan to validate the design of new equipment and infrastructure to ensure continuing reliability.

During the site visit of Kurri Kurri WWTW, the treatment process was consistent with the process flow diagram in the RWQMP and no new equipment or infrastructure had been installed.

The shortcomings in the documentation of the validation of the new Dungog WWTW are discussed under Validation of processes.

Investigative studies and research monitoring

Hunter Water has provided sufficient evidence to demonstrate implementation of the requirements of its Recycled Water Quality Management Plan to establish programs to increase understanding of the recycled water supply system and use this information to improve management of the recycled water supply system.

Evidence was provided as the minutes from the Quarterly Liaison Meetings with NSW Health on 2/12/2020 and 3/3/2022, both meetings had discussion on emerging issues.

Evidence was also provided of a technical paper published on 30 March 2021 on *The Probability of Cysicercus bovis Detection in Livestock from Exposure to Recycled Water in Non-Endemic Countries* that was co-authored by staff from Hunter Water and Hunter Water provided funding and data as part of the study.

Element 10: Documentation and reporting

Management of documentation and records

Hunter Water has provided sufficient evidence to demonstrate implementation of the requirements of its Recycled Water Quality Management Plan to document information pertinent to all aspects of recycled water quality management, and develop a document-control system to ensure current versions are in use, establish a records-management system and ensure that employees are trained to complete records and periodically review documentation and revise as necessary.

During the interviews, Hunter Water Staff were able to access Content Manger and link to documents related to recycled water. As evidence of training in record keeping, Hunter Water provided evidence of Basic Session Mandatory TRIM Training (HW2006-3275/24.011), Training Material – Advanced Session - Mandatory TRIM Training (HW2006-3275/24.012) and training records showing completion of both basic and advanced TRIM training completed by wastewater treatment operations staff.

During the site visit to Kurri Kurri WWTW, Veolia staff were able to access the Hunter Water Portal and demonstrate that the links opened the correct documents.

As noted under Clause 3.2.1 Element 5, the Veolia Guide Sheet 13 – Kurri Kurri WWTW Sample Monitoring and Guide Sheet 5 – Cessnock WWTW Sample Monitoring were overdue for their three yearly review which was due on 12/6/2021. While they were overdue to content was still consistent with the monitoring plan in the RWQMPs.

Reporting

Hunter Water has provided sufficient evidence to demonstrate implementation of the requirements of its Recycled Water Quality Management Plan to establish procedures for effective internal and external reporting and produce an annual report aimed at users of recycled water, regulatory authorities and stakeholders.

Hunter Water produced the reports required under their RWQMS and the IPART Reporting Manual.

Evidence was provided of minutes of quarterly Liaison meetings with NSW Health on 2/12/2020, 3/3/2021 and 2/6/2021 which show discussion on presentation of recycled water.

Evidence was also provided of a recycled water quality report emailed to Eraring Energy on 20/10/2021 with the water quality from Dora Creek WWTW. This report included tables with data from the last month as well as trends and commentary on where water quality had exceeded trigger values.

Weekly report on 6/10/21 from Veolia and monthly report were provided as evidence of internal reporting. Emails showing circulation of these reports to key Hunter Water and Veolia staff were provided as evidence.

Element 11: Evaluation and audit

Long-term evaluation of results

Other than a minor shortcoming, Hunter Water has provided sufficient evidence to demonstrate implementation of the requirements of its Recycled Water Quality Management Plan to collect and evaluate long-term data to assess performance and identify problems and document and report results.

The Kurri Kurri RWQMP includes a summary of recycled water quality from 1/7/2014 to 31/8/2017 compared with the requirements in the AGWR in Table 2-5. Similarly, Table 2.5 in the Cessnock RWQMP includes a summary of recycled water quality from January 2011 to November 2013.

The Cessnock RWQMP is due for review in 2021/22 and Kurri Kurri RWQMP is due for review in 2022/23. The Dungog RWQMP was reviewed in the audit period and the Dungog Recycled Water Risk Workshop Briefing Presentation (12/2/2021) was provided and includes trends of total suspended solids, *E. coli* and biochemical oxygen demand.

The Kurri Kurri and Cessnock RW quality trend spreadsheets include data up to the end of September 2021. These spreadsheets included trends from October 2014 to September 2021 for each quality parameter with control lines for the limits where applicable. There is a minor shortcoming as the limit on the Kurri Kurri Disinfected Effluent UVT was 40% instead of the CCP limit of 45% (recommendation 2021/3.2.2-5). This is only a minor shortcoming as the UVT has never dropped below 50% and the CCP limit in SCADA and in the weekly reports from Veolia is correct.

Audit of recycled water quality management

Hunter Water has provided sufficient evidence to demonstrate implementation of the requirements in its Recycled Water Quality Management Plan to establish a process for internal and external audits and document and communicate audit results.

Hunter Water provided the 2LOD IMS Audit Programme for 2021 and 2022 which shows all the management system audits under the Integrated Management System. This included an audit of Dungog recycled water end user's practices scheduled for May 2021. A copy of the audit report for Dungog WWTW audit undertaken on 14/5/2021 was provided and shows the audit was undertaken to the scope in the audit schedule.

Element 12: Review and continuous improvement

Reviewed by senior management

Hunter Water has provided sufficient evidence to demonstrate implementation of the requirements of its Recycled Water Quality Management Plan for senior managers' review of the effectiveness of the management system and evaluate the need for change.

Minutes of the Hunter Water and NSW Health Liaison Committee Meetings on 2/12/2020, 3/3/2021 and 2/6/2021 show attendance by group managers and executive managers from Hunter Water. Evidence was also provided of presentation of the recycled water improvement plan to the committee meeting on 3/3/2021.

Agenda and minutes of the IMS management meeting on 19 April were provided as evidence and show attendance of group managers across different sections of Hunter Water including recycled water compliance. A presentation to this meeting on developments in the IMS shows opportunities for improvement in recycled water quality management.

Recycled water quality management improvement plan

Hunter Water has provided sufficient evidence to demonstrate implementation of the requirements of its Recycled Water Quality Management Plan to develop a recycled water quality management improvement

plan and ensure that the plan is communicated and implemented, and that improvements are monitored for effectiveness.

A screenshot of the improvement plan actions for Kurri Kurri and Cessnock was provided as evidence. There were no items due in the audit period. The dashboard was viewed during the audit interviews.

A presentation on the recycled water improvement plan to the Hunter Water and NSW Health Liaison Committee Meeting on 3/3/2021 was provided as evidence and the minutes from this meeting show discussion on the improvement plan.

Minutes of the Recycled Water Activities and Compliance meeting on 28/5/2021 documented discussion on upcoming and overdue items on the improvement plan.

Recommendations

Recommendation 2021/3.2.2-1: We recommend by 31 March 2022 that Hunter Water ensure all recycled water customer agreements are not past their expiry date and develop procedures to ensure the agreements are extended or renewed before the expiry date.

Recommendation 2021/3.2.2-2: We recommend by 31 March 2022 that Hunter Water updates the process flow diagram for Kurri Kurri WWTW to reflect the current number of clarifiers and chemical dosing.

Recommendation 2021/3.2.2-3. We recommend by 31 March 2022 that Hunter Water review with Veolia the need for testing of every delivery of aluminium sulphate at wastewater treatment works and update the work instruction for delivery and testing to reflect the outcome of this review.

Recommendation 2021/3.2.2-4. We recommend by 30 June 2022 that Hunter Water include the basis for the 4 log reduction in helminths in the membrane bioreactor at Dungog WWTW and update the Validation Testing Program for Water Recycling Schemes to include the log reductions for the upgraded Dungog WWTW. Hunter Water must also develop a process to ensure changes to log reduction values are reviewed and incorporated into the Validation Testing Program for Water Recycling Schemes.

Recommendation 2021/3.2.2-5, We recommend by 31 March 2022 that Hunter Water updates the Disinfected Effluent UVT limit to reflect the CCP limit in the spreadsheet used to present long term trends of Kurri Kurri recycled water quality and check all other recycled water trend spreadsheets for discrepancies in the limits.

Opportunities for improvement

OFI 2021/3.2.2-1: Clearly label the CCPs at all recycled water schemes including instruments and sampling points used to monitor the CCP.

OFI 2021/3.2.2-2: Update the chemical dosing on the process flow diagram in the Plant Operating Manual – Kurri Kurri WWTW to reflect the current dosing points.

Clause 3.3 – System performance standards

Clause 3.3.1

Table 3-9 Clause 3.3.1 compliance grade

Subclause	Requirement	Compliance grade
3.3.1	<p>Water Pressure Standard</p> <p>a) Hunter Water must ensure that no more than 4,800 Properties experience a Water Pressure Failure in a financial year (Water Pressure Standard).</p> <p>b) A Property is taken to have experienced a Water Pressure Failure at each of the following times:</p> <ul style="list-style-type: none"> i) when a person notifies Hunter Water that the Property has experienced a Water Pressure Failure and that Water Pressure Failure is confirmed by Hunter Water; or ii) when Hunter Water's systems identify that the Property has experienced a Water Pressure Failure. <p>c) Despite clause 3.3.1(b), a Property will not be taken to have experienced a Water Pressure Failure if that Water Pressure Failure occurred only because of:</p> <ul style="list-style-type: none"> i) a Planned Water Interruption or Unplanned Water Interruption; ii) water usage by authorised fire authorities in the case of a fire; or iii) a short term or temporary operational problem (such as a main break) which is remedied within four days of its occurrence 	Compliant
Risk	<p>Failure to meet this standard means that customers will not receive the required pressure as set out in the Customer Contract. This will reduce flow rates. In extreme cases there will be an increased public health risk from backflow into the water network</p>	Target for full compliance
		<p>No more than 4,800 properties are impacted by low water pressure in each financial year, as determined from a confirmed customer pressure complaint or Hunter Water's hydraulic modelling</p>

Summary of reasons for grade

Hunter Water performs well against this standard with 870 properties impacted in 2020-21 against a target of 4,800 and significantly down from 1,975 in 2017-18, and slightly up from 787 in 2019-20.

Unplanned Water Pressure failure is defined as less than a 20-metre head of water pressure for greater or equal to 30 minutes at the point of connection of the Property to the Water Supply System. A Property will not be taken to have experienced a Water Pressure Failure if that failure occurred because of a short term or temporary operational problem (such as a main break) which is remedied within four days of the occurrence.

This clause is graded Compliant.

Discussion and notes

Process

The process is documented in the Hunter Water – IPART Reporting and Monitoring Protocol. Hunter Water records properties with low pressure as a result of the following:

- > Customer contacts
- > Use of field pressure data loggers (temporary – not permanent)
- > Computer hydraulic modelling of system performance

Customers with low pressure are recorded in the Asset Operation and Maintenance System (AOMS) database throughout the year. Low-pressure events are confirmed by field operator visits (in the case of data

loggers and customer contacts). Where a low pressure is confirmed, a process exists for a customer rebate to be processed.

We queried whether Hunter Water has a procedure for confirming low pressure complaints. A documented procedure facilitates a consistent approach and minimises the risk of different approaches/ responses from different teams. While Hunter Water does not have a documented procedure they explained the process, as follows. Typically, a Civil Maintenance first responder would attend and measure the pressure at the front tap. These may be escalated to a customer case where Water Network Operations review the case specifically and look at the local network and compare the pressure measured by Civil Maintenance verses what is expected from the model. If the customer pressure is expected to be low then they would be captured in the annual modelling run. If their pressure shouldn't be low then further investigation is undertaken (closed valves etc) and remedial action undertaken. If there are network configuration changes that result in pressure being affected for a significant length of time then Water Network Operations generate a customer listing and raise a work order which is processed by the AOMS technical officer.

We discussed the benefit of having a documented procedure for confirming low pressure complaints. In response (OFI 2021/3.3.1-1). In response, Hunter Water advised that the Civil team trainer would create a quick guide from old information that was found in manuals and make the new quick guide available to civil users through the civil team space on the intranet. This action was programmed to occur by the end of November 2021.

At the end of financial year, Hunter Water undertakes system modelling to identify known low-pressure areas based on the actual peak day demand experienced in the year. These customers are added to AOMS via a work order.

A query is run to extract all the confirmed low-pressure properties from the AOMS database. Duplicate properties (based on rateable premise ID), identified through a complaint and modelling are excluded.

In accordance with Clause 3.3.1c of the Operating Licence, customers experiencing low pressure as a result of the following events are excluded from the count of water pressure failures:

- > a water interruption (planned or unplanned) in the network
- > water usage by authorised fire authorities in the case of a fire
- > a short term or temporary operational problem (such as a main break) which is remedied within four days of its occurrence

This is managed by using different AOMS problem and solution codes and, where appropriate, commentary for each situation. We were provided with an example of these codes.

In the case where a customer has low pressure and the maintenance team log a low-pressure event in AOMS, further investigation may identify that the low pressure is associated with a nearby main break (water interruption). In this case the low-pressure customer is added as a 'related call' to the water interruption AOMS job, and is therefore, not recorded as a low pressure for calculating the low-pressure system performance standard count.

In the case of a fire event, a solution code 'other' is used in AOMS where when a low-pressure event is caused by water usage by fire authorities. Operational employees verify the solution code. This event is also noted in the job comments.

The low pressure count for the year comprises the number of the properties affected as predicted by the model based on the highest demand condition experienced during the year, plus the confirmed low pressure complaints received throughout the year that are not predicted by the model

Reporting

In early 2020 Hunter Water developed a series of PowerBI dashboards in relation to system performance, and other, indicators including low water pressure. We were provided with a demonstration of the dashboard.

This information is also included in Hunter Water's Reporting and Monitoring Protocol. From a review of this we concluded that the method would result in figures that were consistent with the definition for this indicator.

Quality assurance

The AOMS technical officer audits all confirmed low-pressure events to ensure that the job was processed correctly and that the data recorded accurately. In the case of a discrepancy, the job is corrected, or sent for further investigation to the Water Network Operations team

Calculations

Hunter Water provided a spreadsheet containing the result of modelling which listed 837 properties likely to experience low pressure. The total number reported was 870 which suggests that network modelling has been quite effective in identifying properties experiencing low pressure.

Data trialling

We sighted an AOMS query screen which included, amongst other parameters:

- > Job Type: Customer Complaint
- > Status: Finished Job
- > Problem Code: A – Low Water Pressure

We viewed work orders 649212 and 640572 and sighted resulting example details (call details, job details and mobile history). We sighted evidence of call details (customer reported low water pressure) and a Hunter Water field staff member visiting the site to confirm that the pressure at the tap met requirements, thereby recommending that the customer engage a private plumber. We found that the information recorded in AOMS was consistent with that in the reporting schedule.

Recommendations

No recommendations were made.

Opportunities for improvement

OFI 2021/3.3.1-1 A documented procedure for confirming low water pressure on site should be developed. Hunter Water have confirmed that this action is being implemented

Clause 3.3.2

Table 3-10 Clause 3.3.2 compliance grade

Subclause	Requirement	Compliance grade
3.3.2	<p>Water Continuity Standard</p> <p>a) Hunter Water must ensure that in a financial year:</p> <ul style="list-style-type: none"> i) no more than 10,000 Properties experience an Unplanned Water Interruption that lasts more than five continuous hours; and ii) no more than 5,000 Properties experience three or more Unplanned Water Interruptions that each last more than one hour, <p>(Water Continuity Standard).</p> <p>b) For the purposes of clause 3.3.2(a), Hunter Water must use the best available data (taking account of water pressure data where that data is available) to determine:</p> <ul style="list-style-type: none"> i) whether a Property has experienced an Unplanned Water Interruption; and ii) the duration of the Unplanned Water Interruption. <p>c) If a Property experiences an Unplanned Water Interruption that was caused by a third party, that Property is taken not to have experienced an Unplanned Water Interruption for the purposes of clause 3.3.2(a).</p>	Compliant

Risk	Target for full compliance
<p>If more properties experience unplanned water interruptions than the standard, customers will have not received the level of service they have paid for and there may be public health impacts.</p>	<p>To achieve compliance, it must be demonstrated that:</p> <ul style="list-style-type: none"> • no more than 10,000 Properties experience an Unplanned Water Interruption that lasts more than five continuous hours; and ▪ no more than 5,000 Properties experience three or more Unplanned Water Interruptions that each last more than one hour,

Summary of reasons for grade

Hunter Water performs well against this standard.

- > 3,828 properties experienced unplanned interruptions that lasted more than 5 continuous hours in 2020-21 against a target of 10,000, significantly down from a peak of 10,144 in 2016-17 and 5,114 in 2019-20
- > 940 properties experienced 3 or more interruptions exceeding one hour in 2020-21 against a target of 5,000, significantly down from a peak of 3,228 in 2017-18 and 2,152 in 2019-20

This clause is graded Compliant.

Discussion and notes

Process

A water interruption is defined by Hunter Water as 0 m head of water pressure at the first cold water tap of the property. An unplanned water interruption is when the customer does not receive adequate notice of the interruption (2 days for residential, and 7 days for non-residential) or when a planned interruption extends beyond the notified shutdown time

Water interruptions are recorded in AOMS and the extent is identified by a valve trace in the Hunter Water GIS or by system modelling for larger shutdowns. Shutdowns are assessed against IPART guidelines to classify them as either planned or unplanned.

On more complex discontinuity events, the Water Network Operations team carries out a more detailed investigation which can reveal for example additional closed valves or network configuration issues. If more detailed investigation is required, analysis is performed using information from various sources including computer hydraulic models, SCADA, field operative commentary and customer call information, to determine the properties impacted by discontinuity events. These are then loaded back into AOMS by the Operational Information Team. We were provided with a procedure- Discontinuity Assessment and Reporting Procedure.

Reporting

In early 2020 Hunter Water developed a series of PowerBI dashboards in relation to system performance, and other, indicators including low water pressure. We were provided with a demonstration of the dashboard which provided information on the number of unplanned interruptions that occurred greater than 3 times and the number of planned interruptions exceed 5 hours in duration.

We were provided with SQL (structured query language used in programming and designed for managing data held in a relational database management system such as AOMS) and business rules for extracting from AOMS the number of unplanned interruptions that occurred greater than 3 times and the number of planned interruptions exceed 5 hours in duration. This information is also included in Hunter Water's Reporting and Monitoring Protocol. From a review of this we concluded that the method would result in figures that were consistent with the definition for the two indicators under this clause.

Quality Assurance

For each of these jobs, the AOMS Technical Officer then reviews the job details and audits the information recorded. If the job contains incorrect, incomplete information, or has not been closed correctly, the job is sent to Dispatch or the relevant Hunter Water employee to correct the data.

If the job passes the initial audit, the AOMS Technical Officer undertakes a watermain trace, which involves recreating the job in the GIS system, including verifying the valves that were closed and the number of customers affected by the water discontinuity.

If the watermain trace confirms the data from AOMS, the AOMS Technical Officer updates the relevant datasets.

Hunter Water has processes in place where the watermains trace may not confirm the data from AOMS (e.g. where there is a related water discontinuity customer call from outside the recorded shutdown area. - Where the AOMS Technical Officer is unable to explain the discrepancy between data recorded in AOMS and the GIS watermain trace, the job is referred to the Water Network Operations team so that a water continuity investigation can be conducted. Hunter Water's Discontinuity Assessment and Reporting Procedure was provided.

Calculations

The data is extracted from the AOMS system at the end of financial year using an access database and query. We have provided these queries that include a plain-English explanation (see: Procedure - S2 - Unplanned water interruptions 5 continuous hours - Final for 2017-2022 OL.DOCX and Procedure - S3 – Three or more unplanned water interruptions greater 1 hour - FINAL 2017-2022 OL.DOCX).

For the water continuity standard, we consider each separately billed or occupied part of a multiple occupancy property to be a separate property. This occurs as part of the data extraction from AOMS by cross-referencing the properties identified in AOMS using property information from our Customer Information System (CIS).

Data trialling

We selected a small sample of work orders from the schedule of unplanned water interruptions and trailed them into AOMS to review the event details. The work orders trailed were 641642 and 629787. Work order

The job relating to work order 641642 started as planned water interruption then became an unplanned water interruption when the interruption time exceeded the notified time. Water off: 10/08/2021 9:25, water off: 10/08/2021 15:20

We were provided with information in relation to work order 629787 which involved failure of a DN 375 water main that impacted on 280 properties. Auditees explained the sequence of events. The repair time was 442 minutes (> 5 hours) but customers were only interrupted for 105 minute (> 1 hour) and recorded as such in the Discontinuity Register. The Discontinuity Register is a register of all water continuity work orders that require further investigation.

We were also shown work order 636772 which was a water main failure that impacted multiple customers. Auditees explained how this event was not classified as an unplanned interruption as it was caused by a third party (“Fault type does not equal 4” in the SQL query)

We found that the information recorded in AOMS was consistent with that in the reporting schedule.

Recommendations

No recommendations were made.

Opportunities for improvement

OFI 2021/3.3.2-1 Detailed investigations into unplanned water interruptions are listed in the Discontinuity Register. This title may be confusing and it is suggested that the spreadsheet is termed the Discontinuity Investigation Register which may be a more appropriate title.

Clause 3.3.3

Table 3-11 Clause 3.3.3 compliance grade

Subclause	Requirement	Compliance grade
3.3.3	Wastewater Overflow Standard a) Hunter Water must ensure that in a financial year: i) no more than 5,000 Properties experience an Uncontrolled Wastewater Overflow in dry weather; and ii) no more than 45 Properties experience three or more Uncontrolled Wastewater Overflows in dry weather, (Wastewater Overflow Standard)	Compliant
Risk	If more properties experience more dry weather uncontrolled wastewater overflow events there will be a higher public health and environmental risk as well as increased reactive maintenance costs	Target for full compliance To achieve compliance, it must be demonstrated that: <ul style="list-style-type: none"> ▪ no more than 5,000 Properties experience an Uncontrolled Wastewater Overflow in dry weather; and ▪ no more than 45 Properties experience three or more Uncontrolled Wastewater Overflows in dry weather

Summary of reasons for grade

Hunter Water performs well against this standard:

- > 2,225 properties experience uncontrolled wastewater overflows in dry weather during 2021 against a target of 5,000, down from a peak of 3,347 in 2017-18
- > 7 properties experienced 3 or more uncontrolled wastewater overflows in dry weather against a target of 45, down from a peak of 22 in 2017-18.

This clause is graded Compliant.

Discussion and notes

Process

Hunter Water has processes and systems in place for the monitoring and determining the number of Properties that experience an Uncontrolled Wastewater Overflow

The call centre has a training system in place, including scripts of questions to ask customers (e.g., to identify if shaft, manhole or gully). However, sometimes shaft overflows are caused by main chokes.

All reports of sewer surcharges received from public or internally are recorded in the AOMS database.

A field operative will respond to a report of a sewer overflow and verify that an overflow has occurred. The field operative collects data including the asset type, cause, action taken, wet weather and affected properties. This data is logged in the AOMS system.

Where it is difficult to identify the precise location of the problem, field staff have been instructed to err on the side of nominating it as a Hunter Water problem and therefore is included in the licence count.

The field staff also assess if it is a wet weather overflow. If roots, rags or fats etc. contribute to the overflow it is considered a dry weather overflow and therefore is included in the licence count.

Where a property has a second overflow event in the financial year the cause is investigated

Reporting

We were provided with SQL and business rules for extracting from AOMS the number of uncontrolled dry weather wastewater overflow events and properties experiencing 3 or more dry weather overflows within a financial year.

To determine the number of Properties that experienced an Uncontrolled Wastewater Overflow in dry weather a Query on the AOMS database is ran. The query is called "S4 – Uncontrolled Wastewater Overflow (dry Weather) (HW2009-1194/14/4.012)

To determine the number of Properties that experience three or more Uncontrolled Wastewater Overflow in dry weather a Query on the AMOS database is ran. The query is called "S5 – 3 or more Uncontrolled Wastewater Overflow (dry Weather) (HW2009-1194/14/4.013)

This information is also included in Hunter Water's Reporting and Monitoring Protocol. From a review of this information we concluded that the method would result in figures that were consistent with the definition for the two indicators under this clause.

In early 2020 Hunter Water developed a series of PowerBI dashboards in relation to system performance, and other indicators including dry weather overflows. We were provided with a demonstration of the dashboard which provided information on dry weather overflows, properties affected, hot spots etc.

Quality assurance

The AOMS Technical Officer reviews the job details and audits the information recorded as is done for the other service performance standards. It was noted that the process described in Hunter Water's IPART Reporting and Monitoring Protocol appears to be a copy of the process for watermain. Hunter Water advised that this was an error and that the Reporting and Monitoring Protocol document would be fully reviewed once the updated BOM National Performance Reporting requirements were issued in late February 2022 (recommendation 2021/6.2.1-1).

Calculations

We were able to view how the final totals were determined through viewing the PowerBI outputs.

Data trialling

During the audit we reviewed and tracked the 7 properties in 2020-21 where 3 or greater dry weather overflow events were recorded and reported to IPART. We found that the properties and number of events were listed.

In drilling through the data, we noticed that a property at 11 Derna Rd Shortland had experienced 13 historic dry weather overflow events since 2003. We queried why this property had experienced so many events and why the problem had not been resolved. Hunter Water responded that the sewer was relined in 2011 but the overflows continued from 2013 onwards with 2 overflows recorded in 2019 and 3 in 2021. We were advised that further investigations using CCTV revealed an abandoned junction which was patch repaired in 2021. It was hoped that this action would resolve the problem. Hunter Water advised that this action would be supplemented by undertaking preventive jetting on the main (OFI 3.3.3-1).

Recommendations

No recommendation is made relating to Clause 3.3.3 Wastewater Overflow Standard. A recommendation regarding Hunter Water's IPART Reporting and Monitoring Protocol is made under Clause 6.2 Reporting Manual.

Opportunities for improvement

OFI 3.3.3-1 Monitor and report on whether actions taken to reduce dry weather overflow events at 11 Derna Rd, Shortland have been effective.

Clause 4.1 – Asset management system

Clause 4.1.2

Table 3-12 Clause 4.1.2 compliance grade

Subclause	Requirement	Compliance grade
4.1.2	By 1 July 2018, Hunter Water must ensure that the Asset Management System is fully implemented and must, from that date, ensure that all relevant activities are carried out in accordance with the Asset Management System.	Compliant
Risk	Assets are poorly managed leading to higher costs and failure to meet required service levels including public health and environmental protection.	Target for full compliance Sufficient evidence that a Management System for assets is in place consistent with the standard and that it is maintained.

Summary of reasons for grade

We found that Hunter Water had a sound and appropriate asset management system in place which is being continually improved.

We observed throughout the audit that Hunter Water fully understood the need for a ‘whole-of-business’ approach to asset management which requires active participation, understanding and competency of all Hunter Water staff from executive to field practitioners. Our observations concur with the findings of the WSAA Asset Management Customer Value 2020 Benchmarking Report which concluded that asset management is a business philosophy within Hunter Water and is not treated as just another team. In our opinion documentation can only go so far, a successful and sustained asset management system to meet the requirements of ISO55001 requires the buy-in of the whole organisation.

This clause is graded Compliant.

Discussion and notes

Hunter Water has a certified Asset Management System to ISO55001. The original certification was issued on the 11 July 2018, as required in the 2017-22 Operating Licence and is valid until the 9 July 2023. Hunter Water successfully completed an ISO 55001:2014 surveillance audit of its certified asset management system in May 2021. Improvement opportunities identified included progress on updating asset class plans, recording and monitoring improvements listed in asset class plans and IMS and AMS audit planning and scheduling. A minor non-conformance was identified in the surveillance audit which related to the alignment of its asset management objectives with the appropriate risk and opportunity mitigation actions within asset management plans. Hunter Water advised that in response the Standard - Asset Class Management has been updated including specific alignment of asset class objectives with SAMP objectives. We confirmed that Section 6 of the Standard – Asset Class Management included this requirement.

We were provided with the WSAA Asset Management Customer Value 2020 Benchmark Report which benchmarked asset management practices across 19 Australian Water Utilities based on the 39 subject areas and guidance within the Asset Management Landscape, Global Forum on Maintenance and Asset Management (GFMAM). The project compared Hunter Water with other medium sized retailer water utilities which showed that Hunter Water is achieving the 75th percentile score (best performing quartile) for five out of the six subject groups. Improvement opportunities were identified in the areas of shutdown & outage strategy, shutdown & outage management, asset information strategy and competence management.

We sighted Hunter Water’s Asset Management System intranet site (reservoir.hunterwater.com)

Policy

Hunter Water’s Asset Management Policy outlines the approach to managing the physical assets needed to provide services to customers and the community. The Asset Management Policy was updated on the 9 October 2021 with the next review scheduled for October 2025.

Asset Management System Steering Committee

The Asset Management System (AMS) Steering Committee meets every quarter and comprises senior management (generally Group manager level) from across the business. We were provided with the Terms of Reference for the Asset Management Steering Committee and the minutes of the June and September 2021 meetings which demonstrated that the committee has senior management involvement and a whole-of-business and continual improvement approach to the implementation of the asset management system. It was also noted that the committee is keen to see improved alignment within the asset management system and with Hunter Water's strategic priorities which is further discussed in this section.

SAMP

The Strategic Asset Management Plan (SAMP) is an overarching document describing how services are to be provided through continual planning, delivery and management of assets.

We found that the SAMP was a well written document of an optimal length and clearly and concisely meets the requirements set out in ISO55001. From discussions with the auditees we identified a few potential improvement opportunities which could be considered during the next biennial or periodic review. It is noted that an updated SAMP is programmed to be reviewed and approved by the Managing Director in December 2021.

Hunter Water's strategic direction is documented in the Towards 2024 Business Plan; the SAMP mentions the document and lists the strategic priorities in pages 7 and 8. The nine primary asset management objectives are listed in section 5.2 on page 16. The linkage of the asset management objectives to the Towards 2024 Business Plan is briefly mentioned in section 5.3. It is considered that a stronger alignment could be shown between the asset management objectives and the four strategic priorities in the Business Plan by having a table of asset management objectives showing which strategic priorities they are aligned to via the use of the four icons (OFI 2021/4.1.2-1). It was noted that these linkages were well presented in the Board paper on asset management dated 24 June 2021.

To demonstrate alignment of objectives, Hunter Water later provided evidence showing the monitoring and reporting of actions to achieve the goals within the Towards 2024 Business Plan, a significant number of which were asset management related.

To maintain alignment, it would be desirable for a periodic review of the SAMP to be programmed to be undertaken shortly after the issue of the next update of the Business Plan (OFI 2021/4.1.2-2).

During the discussion it was mentioned that asset management was to sustain service into the long term which would come under the 'Our foundation' (i.e. business as usual) part of the strategy. Consideration could be given in the next update of the Business Plan to highlight the business as usual functions such as sustaining the service into the long term (OFI 2021/4.1.2-3).

It was noted that there was occasional inconsistency in documenting the asset management objectives across documents. For instance, the Asset Management Performance Report lists the objectives in a different order with some objectives re-worded (e.g. deliver efficient services in the Asset Performance Report verses deliver efficient and innovative solutions in the SAMP) (OFI 2021/4.1.2-4). Nevertheless, the information provided in the Asset Management Performance Report did demonstrate alignment of asset management performance against the asset management objectives.

Stakeholders are only briefly mentioned in the section 2.3 of the SAMP. We noted that stakeholders such as developers who design and construct a significant amount of infrastructure were excluded as had bulk water customers such as Central Coast Council and Mid-Coast Council. In response Hunter Water advised that stakeholder requirements were documented in the current format of asset class plans/ facility plans such as the Lemon Tree Passage Water Treatment Plant Facility Plan which included a stakeholder listing and requirements/expectation in section 2.3.1.

It would be desirable to capture all stakeholders and requirements from the asset management system (included where documented such as agreements, regulatory requirement) in one location which could be cross referenced in the SAMP and asset class plans (OFI 2021/4.1.2-5).

Asset Class Plans

Hunter Water manages the asset lifecycle through Asset Class Management, in which the assets are segregated into asset class categories based on both service requirements (water, wastewater), asset disciplines (mechanical, electrical, civil) and asset types (pipes, structures, pumps, transformers). Development of asset class plans is guided by the Standard – Asset Class Management.

Hunter Water has 34 asset class plans in place categorised under:

- > Community safety critical assets (e.g. dams, water treatment plants, transformers) -15 no. plans
- > Fatal assets – safety critical assets (e.g. lifting equipment, pressure systems) – 8 no. plans

- > Critical/major (operational) consequence assets (e.g. reservoirs, critical water mains, sewer rising mains) – 11 no. plans

Hunter Water provided an Asset Class Plan Register. It was noted that the community safety critical asset plans were updated in 2020 and the fatal assets – safety critical asset plans over two years' old are being updated while critical/major (operational) consequence asset plans are scheduled for development/ update in 2022-23.

We were provided with the Facility Plan for Lemon Tree Passage Water Treatment Plant (prepared in August 2020) which was a comprehensive document which addresses the elements of a good asset management plan. The plan could be improved through clearly showing how the Plan contributes to the achievement of the asset management objectives (alignment of the asset management objectives with strategic priorities is discussed under the SAMP text) (OFI 2021/4.1.2-6). It was noted that Appendices E, F and G were incomplete or a cross reference was required to the location of the referenced documents.

We were also provided with the Asset Management Plan (Operations and Maintenance) for Chichester Dam which again was a comprehensive document. It was noted that this document included a table showing the alignment between asset management objectives relevant to Chichester Dam and specific Chichester Dam objectives.

During audit we sighted the Asset Class Plan Fatal Mechanical Assets which showed mapping between asset class plan objectives and objectives for individual asset class categories (e.g., safety valves, pressure vessels).

Planning and Investment Decision Making

The Towards 2024 Business Plan sets the direction for Hunter Water and identifies the outcomes that will define its success, as well as the measures and targets which will evaluate our progress towards those outcomes. The relationship between the Asset Management System and the Business Plan is described in earlier text in this report.

Hunter Water undertakes planning at various levels, from strategic through to detailed planning, for infrastructure and non-infrastructure investment to achieve the strategic priorities and objectives outlined in the Towards 2024 Business Plan. This planning includes service and growth plans (5 - 25-year horizon), asset and compliance plans (5 - 25-year horizon) and network and facility specific plans. Strategic Cases using Investment Logic Maps are prepared to demonstrate the case for change and associated future investment objectives and benefits. The Strategic Case for Safe and Reliable Water Services and the Hunter Water Growth Plan 2021, Asset Class Plan - Lemon Tree Passage Water Treatment Plan were provided as examples of the planning undertaken.

Hunter Water implements planning through Service and Asset Planning, where the organisational objectives are assessed and investment programs or projects are identified to implement the outcome. Asset planning includes service and growth plans for capacity upgrades and performance upgrades and asset and compliance plans for in-service asset management planning functions

Hunter Water governs and prioritises the capital portfolio through a gateway approval process (modified version of the NSW Treasury process) within the Asset Creation Framework (ACF) which follows once the asset planning process has identified an asset solution, and the investment decision-making process (business case) has determined the optimal means of meeting a current or future service standard at the lowest lifecycle cost. Intranet download images for the Asset Creation Framework (ACF) and Gateway Approval Process were provided.

From a review of the information provided and audit interviews we consider that Hunter Water has sound planning and decision-making processes in place.

Risk Management

We noted the key role that risk management played in Hunter Water's decision-making process through review of the documentation provided and audit interviews. The enterprise risk management (ERM) framework includes risk appetite statements and are defined for specific business risks associated with elements of the Asset Management System. Asset-related risks are managed in accordance with the updated Enterprise Risk Management. These risks are monitored within the service and regulatory requirements through annual risk reviews. Copies of the Standard - Enterprise Risk Management, Risk Appetite Statement Summary and Risk Driver Analysis Critical Asset Failure – 2020 were provided as evidence.

Hunter Water advised that a new risk appetite level (as low as reasonably practical (ALARP) had been introduced for the following risks:

- > Critical safety impacts from unsafe work environments/behaviours

- > Public health impacts
- > Loss of drinking water due to inadequate source capacity
- > Fatality or permanent disability from critical asset failure

Critical Assets

Hunter Water's approach to asset criticality is documented in the Standard – Critical Assets. Throughout the audit we found that criticality ranking was consistently a key element in Hunter Water's decision-making process.

Asset Standards

Asset standards have been developed by Hunter Water to ensure that assets are designed and constructed to ensure that assets achieve the desired outcomes at the lowest lifecycle cost. Implementation of the standards is facilitated through appropriate training accreditation of internal and external designers undertaking work for Hunter Water.

Maintenance

Maintenance is split into two main disciplines:

- > Civil maintenance which is managed through AOMS. Civil maintenance practices are predominantly corrective maintenance – planned and unplanned (breakdown).
- > Electrical-mechanical maintenance which is managed through Ellipse. Electrical-mechanical maintenance is predominately preventive with some corrective. Some predictive maintenance is undertaken through condition monitoring of some equipment.

We asked Hunter Water to provide evidence of maintenance KPIs. The electrical-mechanical KPIs for network assets showed an improved trend from 2015 to 2020 for planned work with 100% of planned maintenance tasks for critical and other assets being achieved in 2020. 79% of maintenance tasks undertaken in 2020 were planned. This trend has resulted in Priority 1 breakdowns reducing from a monthly average of 103 in 2015 to 58 in 2020.

Operation and maintenance of the water and wastewater treatment plants is contracted put to Veolia. Veolia submits monthly reports to Hunter Water which includes reporting on maintenance performance against target KPIs for preventive, breakdown and corrective maintenance. A sample monthly report was provided as evidence.

For civil maintenance a sample of dashboard outputs were provided showing a range of outputs including monthly percentage compliance with response and rectification targets.

We found that Hunter Water's approach to maintenance was well developed.

Condition Assessment

The Asset Management Performance Report 2020 indicates that overall, the asset health remains good (overall rating of fair for most asset classes) with asset age, condition and failures remaining within anticipated nominal life, with a small number of exceptions which Hunter Water have identified and are being replaced or upgraded.

The State of the Assets Report presented to the Board Investment Committee in September 2021 includes an asset health rating for each of the asset classes based on a combination of overall asset performance, condition and risk. We found this report to be very informative with critical information being clearly and succinctly presented to management. Table 3-13 summarises the results.

Table 3-13 State of the Assets Report summary

Asset class	Asset health
Raw water	Good
Water treatment	Good
Water network	Good
Wastewater network	Fair
Wastewater treatment	Fair
Recycled water	Good
Stormwater assets	Good
Electrical assets	Fair

Asset class	Asset health
Mechanical assets	Fair

Condition assessment programs for some assets are based on criticality (i.e. dams, reservoirs, sewer, stormwater) whilst others are based on events, CCTV of sewers, watermain failures.

Hunter Water will shortly commence a condition assessment program of all water and wastewater treatment plants. The network asset condition program is in the early stages, Hunter Water reported that a proposal to undertake this program is currently under review and will shortly be implemented. Both programs will involve level 1 condition assessment as outlined in the IPWEA Condition Assessment and Asset Performance Guidelines.

The treatment plant condition assessments will inform tenderers for the re-tendering of the treatment plant operation and maintenance in 2023.

We were provided with a Reservoir Inspection Training presentation. We viewed the document which was well presented, thorough and communicates the water quality risks well. Slide 16 indicated that holes greater than 2cm should be addressed. Any hole/ crack in the roof will allow contaminated stormwater to enter the reservoir. During the site visit to the Abermain Reservoir a hole of approximately 2cm was observed on a roof ridge capping, but no action had been taken as a criterion to initiate action had not been specified in the work instruction. Hunter Water have subsequently provided evidence that this hole has been repaired (SE-076 a and b).

It is recommended that remedial action should be taken on any sized hole or crack in a reservoir roof. The reservoir inspection training and work instructions should be amended to reflect this requirement (OFI 2021/4.1.2-7).

Asset Renewals

Asset Renewals are prioritised based on risk identified through the outcomes of condition assessment programs and asset performance. Renewals programs are justified through business cases, a few of which were provided as evidence.

Under the Treatment Operations Contract, Veolia submits a minor capital works Project Development Plan (PDP) to Hunter Water for renewals, which is then assessed by internal stakeholders and prioritised using a risk-based approach.

Hunter Water are of the opinion that in the future, significant asset relocation will be required in the Lake Macquarie Council area which is the most at-risk council for sea level rise.

Based in current available information Hunter Water does not consider that an infrastructure renewal cliff is likely but does foresee an increase in renewals expenditure. The asset condition programs being implemented should improve Hunter Water's long-term estimate of asset renewals. Once reliable condition information is available it would be beneficial to undertake long term financial modelling to assess the likely customer charge/ service level impacts based various asset renewals and climate change scenarios. This information would provide a long-term context for future pricing submissions (OFI 2021/4.1.2-8).

Communication and awareness

Hunter Water has a mandatory Online Asset Management Induction Training for all new employees up and contractors up to executive level. A link to the training was provided, reviewed by the auditor and found to be quite informative to a range of Hunter employees. We were provided with a spreadsheet which listed that 20 employees had undertaken an asset management fundamentals course and 485 employees had completed the asset management system awareness course.

We viewed the Asset Management System intranet site which is Hunter Water's primary information source on the asset management system.

We discussed the level of asset management awareness at Board level. Hunter Water indicated that the Board was kept informed of asset management developments and provided a report on Strategic Asset Management to the Board meeting on the 24 June 2021.

Asset Management Competence

Hunter Water develops the asset management competence of its employees at three levels:

- > Level 1 – high-level information about the asset management system as part of induction training (discussed under communication and awareness)
- > Level 2 – training relevant to an individual's roles and responsibilities

- > Level 3 – in-depth training relating to asset management system responsibilities.

Hunter Water has an established competence framework in place. Hunter Water advised that they were embarking in an initiative to ensure that asset management requirements are captured and are relevant to the needs and requirements of the asset management objectives and contributes to capacity building. The initiative will also consider asset management competence from Executive through to practitioner levels. This initiative was one of the recommendations in the AMCV benchmarking report. We were provided with a proposal for the development of an Asset Management Capability and Competency Enabling Program.

We observed throughout the audit that Hunter Water fully understood the need for a ‘whole-of-business’ approach to asset management which required active participation, understanding and competence of all Hunter Water staff from executive to field practitioners.

Monitoring and Review

Hunter Water has a range of asset management monitoring and reporting processes across the business including:

- > System performance dashboards
- > Monthly performance reporting
- > Business Performance Report
- > State of the Assets Report
- > Asset Management Performance Report
- > Compliance and Performance Report which provides an overview of completed improvement actions in the financial year and proposed activities and programs.

The Asset Management System management review is aligned with Integrated Management System review by senior management.

We were provided with a sample of the above reports and during the audit interviews we sighted reports in PowerBI (system performance, reservoir, complaints, electrical-mechanical maintenance performance). We also Sighted corporate scorecard – key performance indicators (e.g., safety, organisational culture, non-revenue water reduction etc).

Recommendations

No recommendations were made.

Opportunities for improvement

OFI 2021/4.1.2-1: It is considered that that a stronger alignment could be shown between the asset management objectives in the SAMP and the four strategic priorities in the Business Plan.

OFI 2021/4.1.2-2: The periodic review of the SAMP could be programmed to be undertaken shortly after the issue of the next update of the Business Plan to ensure continued alignment

OFI 2021/4.1.2-3: Consideration could be given in the next update of the Business Plan to highlight the business as usual functions such as sustaining the service into the long term

OFI 2021/4.1.2-4: Asset management objectives, and their order, should be consistently presented across documents.

OFI 2021/4.1.2-5: It would be desirable to capture all stakeholders and requirements from the asset management system in one location which could be cross referenced in the SAMP and asset class plans

OFI 2021/4.1.2-6: The Asset Class Plans could be improved through clearly showing how each Plan contributes to the achievement of the asset management objectives. It is noted that the Asset Management System Steering Committee is aware of the need to improve alignment across documents.

OFI 2021/4.1.2-7. Update the reservoir inspection training material, work instructions and checklist to indicate that remedial action should be undertaken as soon as possible on any sized hole or gap identified in a reservoir roof

OFI 2021/4.1.2-8: Once reliable condition information is available it would be beneficial to undertake long term financial modelling to assess the likely customer charge/ service level impacts based on various asset renewals and climate change scenarios. This information would provide a long-term context for future pricing submissions.

Clause 4.2 – Environmental management system

Clause 4.2.1

Table 3-14 Clause 4.2.1 compliance grade

Subclause	Requirement	Compliance grade
4.2.1	Hunter Water must at all times maintain a Management System for carrying out the functions authorised under this Licence that is consistent with the Australian/New Zealand Standard AS/NZS ISO 14001:2016 Environmental management systems – Requirements with guidance for use, or other standard approved by IPART on request by Hunter Water (the Environmental Management System).	Compliant
Risk	Target for full compliance	
Without adequate Environmental Management Systems there is a risk that Hunter Water will have a negative impact on the environment	Evidence that the Environmental Management System covers all authorised functions of Hunter Water and is maintained	

Summary of reasons for grade

Hunter Water has demonstrated that it has in place and maintains an Environmental Management System consistent with AS/NZS ISO14001:2016 and the scope of this covers all services provided by Hunter Water as authorised by the Operating Licence.

This clause is graded as Compliant.

Discussion and notes

Hunter Water has met the requirements of this clause to maintain a Management System for carrying out the functions authorised under this Licence that is consistent with the Australian/New Zealand Standard AS/NZS ISO 14001:2016 Environmental management systems – Requirements with guidance for use.

Hunter Water provided the certification by Bureau Veritatis that their Environmental Management System (EMS) was approved as compliant to ISO 14001:2015 on 20/10/2014 and certification is currently valid until 9/7/2023.

The scope of the certification includes all services provided by Hunter Water within its area of operations including construct, operate and manage drinking water, recycled water, sewerage, wastewater disposal and stormwater services.

Hunter Water's Community and Environment Policy (HW2012-738/6, v4.0, dated November 2018) was provided and is current and due for review in November 2021.

Hunter Water have incorporated their EMS into the corporate Integrated Management System (IMS). A compliance audit of the IMS was undertaken by Bureau Veritatis between 17/5/2021 and 21/5/2021. This audit recommended that certification with ISO 14001:2015 be continued.

The IMS contains broad roles and responsibilities, Plan – EP0013 Structure and Responsibility (HW2012-738/1.002, v5.0, dated October 2021) provides additional responsibilities. This document is available on the EMS page on Hunter Water's intranet. There is an opportunity for improvement to provide a link to this document from the IMS (OFI 2021/ 4.2.1-1).

During the audit interviews, Hunter Water staff were able to follow link from IMS to the Aspects and Risk Procedure. Hunter Water staff were also able to access the EMS page on Hunter Water's intranet and follow links to plans and work method statements.

Recommendations

No recommendations were made.

Opportunities for improvement

OFI 2021/ 4.2.1-1: Provide link to Plan – EP0013 Structure and Responsibility (HW2012-738/1.002) from the IMS section on Roles and Responsibilities

Clause 4.2.2

Table 3-15 Clause 4.2.2 compliance grade

Subclause	Requirement	Compliance grade
4.2.2	Hunter Water must fully implement, and carry out all relevant activities in accordance with, the Environmental Management System.	Compliant
Risk	Target for full compliance	
If the Environmental Management System is not implemented fully there is a risk that Hunter Water will have a negative impact on the environment.	Evidence that all activities in the Environmental Management System are being fully implemented.	

Summary of reasons for grade

Hunter Water has demonstrated that it has fully implemented all activities under its Environmental Management System.

This clause is graded as Compliant.

Discussion and notes

Hunter Water has met the requirements of this clause to fully implement, and carry out all relevant activities in accordance with, the Environmental Management System.

The copy of the Community and Environment Policy on Hunter Water's [website](#) was viewed and is the same version as provided as evidence.

The IMS Training Matrix was provided as evidence and shows training of management and field staff in environmental work instructions, incident reporting and chemical awareness. The training presentation on Environmental Impact Assessment and Heritage Management was also provided and review showed it provided adequate coverage of legislative requirements and Hunter Water work instructions

An Internal Audit of Environmental Compliance was completed by Deloitte between February 2020 and March 2021. The audit gave an overall assessment of Minor Improvement Required. The main action from this audit was to operationalise weed management practices. During the interviews, Hunter Water showed this action completed in the Biosecurity Management Strategy dated October 2021.

A review of the Procedure EP0010 0 Environmental Aspects and Risk Assessment (HW12-738/8.008, v8.0, dated May 2020) requires a full review of the risk assessment of all aspects every two years. This review was undertaken during the audit period and there is a MS Teams recording of these meetings with key stakeholders within Hunter Water. As part of this review a Risk Driver Analysis Summary – Non-compliance with Environmental Legislation (HW2013-830/14/5, dated 14/9/2021) was prepared for the Executive Management Team (EMT). This summary includes aggregated risk ranking and risk appetite and treatment plan for items outside the risk appetite.

A copy of the EMT Monthly Environment Report from July 2021 and the Management Systems Review - April 2021 were provided as evidence of senior management review of the EMS.

The 2LOD IMS Internal Audit Schedule was provided of all Second Line of Defence (2LOD) audits including EMS. This schedule shows an audit of Grahamstown WTP and George Schroder Pump Station scheduled for September 2021. The audit inspection checklist was provided as evidence and is dated 30/9/2021.

Hunter Water also have a schedule of depot and work sites inspections that includes treatment plant sites, depots and mobile work crew inspections. The following inspection reports were provided as evidence of completion of these reviews:

- > Raymond Terrace WWTW Inspection Report (9/9/2021)
- > Work site inspection report from Hunter St Toronto (8/9/2021)
- > Work site inspection report from Sara St Toronto (22/9/2021).

Environmental inspections of capital works construction sites are undertaken by environmental staff within the Asset Solutions group. These inspection reports are kept in the project management records for the

project and are eventually loaded into Content Manager. A spreadsheet was provided and shows 106 environmental inspections of construction works during the audit period.

Recommendations from audits and inspections are loaded into Integrum. Hunter Water staff were able to show an example of the Edgeworth WWTW inspection completed in April 2021 with links to Content Manager and due on 17 December 2021. As Integrum does not handle opportunities for improvement well, these are currently recorded as actions in MS Teams. Hunter Water plan to implement a new Watershed system to handle recommendations and opportunities for improvement.

Recommendations

No recommendations were made.

Opportunities for improvement

No opportunities for improvement were identified.

Clause 4.3 – Quality management system

Clause 4.3.1

Table 3-16 Clause 4.3.1 compliance grade

Subclause	Requirement	Compliance grade
4.3.1	Hunter Water must at all times maintain a Management System for carrying out the functions authorised under this Licence that is consistent with the Australian/New Zealand Standard AS/NZS ISO 9001:2016 Quality management systems – Requirements, or other standard as approved by IPART on request by Hunter Water (the Quality Management System).	Compliant (minor shortcomings)
Risk	Target for full compliance	
Not meeting this clause requirement could put Hunter Water's ability for it to meet its defined objectives, across all of its business, at risk. As an overarching organisational obligation, this clause is significant.	Systems and processes that meet the requirements of the clause, and are implemented in practice, are required for full compliance.	

Summary of reasons for grade

The licence requires Hunter Water to maintain a management system that is compliant with Australian/New Zealand Standard AS/NZS ISO 9001:2016 Quality management systems – Requirements. Hunter Water is certified, and maintained a system, to ISO 9001:2015, which has identical provisions to the AS/NZS ISO 9001:2016. Therefore, certification to ISO 9001:2015 is acceptable. Evidence was provided of a recent external surveillance audit which found no non-conformances and confirmed that Hunter Water had established and maintained its management system in line with the requirements of the standard, and demonstrated the ability of the system to achieve requirements for products and services within the scope and the organisation's policy, objectives and legal compliance. However, Hunter Water found that the system it has in place was producing systemic document control failures and is undertaking measures to address this. The failure is considered a shortcoming because other than the document control failure (a requirement of ISO 9001 Clause 7.5 'Documented Information'), the requirements of the clause have been met.

This clause is graded as compliant (minor shortcomings) with one recommendation (Recommendation 2021/4.3.1).

Discussion and notes

The audit of the quality management system clause is the first for this licence period. To audit this clause, evidence was relied on from the following sources:

- > Documentation, web-based portal or other to demonstrate compliance with the standard (or other as approved – noting that no evidence was provided for another standard).
- > Certification evidence.
- > Recent (within the audit date scope) recertification or surveillance audit report.

In addition, the same auditor with responsibility for this clause was also responsible for the drinking water quality management clause (3.1.1 and 3.1.2) and this area was used as a focus to test aspects of the quality management system (see Elements 1, 10, 11 and 12 in particular in particular for the sections in this report relating to Clause 3.1.1 and 3.1.2).

Hunter Water achieved initial certification (Bureau Veritas) to ISO 9001 in August 2015 (HW2013-1447 18 4.006 Certificate - AU004026-1 HWC - QMS ISO 9001 - Jul) and has continuously maintained and passed the most recent, external, annual surveillance audit which occurred in May 2021.

The certificate was checked to ensure that the scope of the certification included all functions authorised under its licence. Evidence provided supported the statement with the following being covered:

“PROVIDE, CONSTRUCT, OPERATE, MANAGE AND MAINTAIN EFFICIENT, COORDINATED AND COMMERCIALY VIABLE SYSTEMS AND SERVICES FOR SUPPLYING DRINKING AND RECYCLED

WATER, PROVIDING SEWERAGE AND STORMWATER SERVICES AND DISPOSING OF WASTEWATER THROUGHOUT ITS AREA OF OPERATIONS UNDER AN OPERATING LICENCE GRANTED BY THE NSW GOVERNMENT.”

The certificate currency is 13 August 2015 to 9 July 2023 (with an issue date of 10 July 2020 – noting that certificates are issued on a 3-year basis). The surveillance audit report confirmed the validity of the certification (BVC AUDIT REPORT SV1 May21 at p16). Hunter Water also passed the recent external audit (May 2021) with no non-conformances.

The Integrated Management System (IMS) Manual covers all aspects of the quality and other management systems in place at Hunter Water (ISO 9001, ISO 45001, ISO 14001 and ISO 55001).

Portals and systems have been developed to meet the requirements of the IMS and the adequacy and currency of these was sighted and confirmed during the auditing of Clause 3.1.1.

In terms of maintenance of the document control part of the system, Hunter Water placed a non-conformance on itself due to system issues (system overwriting footers on documents). This aspect is not considered material for this part of the clause because of the following reasons:

- > Hunter Water had picked up the document control risk, which means that the QMS is working in practice as it was designed to do (an implementation issue) but the system for document control is not meeting the requirements of ISO Clause 7.5 (requirements for documentation control).
- > The fact that Hunter Water had a self-initiated non-conformance (evidence sighted in Integrum), demonstrates that another aspect of the QMS requirements, ‘commitment’, is in place and embedded.
- > The surveillance audit resulted in no non-conformances and concluded that Hunter Water had established and maintained its management system in line with the requirements of the standard, and demonstrated the ability of the system to achieve requirements for products and services within the scope and the organisation’s policy, objectives and legal compliance.

Recommendations

Recommendation 2021/4.3.1: By 31 October 2022, Hunter Water should develop a plan for, and report on implementation progress of the proposed Integrated Management System document control opportunities for improvement (p26, IMS Management Review Meeting 26/04/21).

Opportunities for improvement

No opportunities for improvement were identified.

Clause 4.3.2

Table 3-17 Clause 4.3.2 compliance grade

Subclause	Requirement	Compliance grade
4.3.2	Hunter Water must fully implement, and carry out all relevant activities in accordance with, the Quality Management System.	Compliant
Risk	Not fully implementing the requirements of this clause could put all organisational obligations and licence compliance at risk.	Target for full compliance Systems and processes that meet the requirements of the clause, and are implemented in practice are required for full compliance.

Summary of reasons for grade

While the maintenance component of the quality clause was found compliant (minor shortcomings), review of critical documentation in the drinking water clause revealed no major currency shortcomings in critical documents.

This clause is graded Compliant because the maintenance issue did not result in an implementation non-conformance in practice.

Discussion and notes

As noted above, Hunter Water had a self-initiated non-conformance for systemic document control issues (Integrum NCR LHAG-79FDEA) with the failures ongoing. Management review meeting minutes were checked and confirmed that data cleansing is recognised as required and is in progress. There are many overdue documents which is why Hunter Water initiated the non-conformance.

While a review of documents in the drinking water clause revealed no major currency shortcomings in critical documents, there needs to be a focus on improving the implementation of currency requirements, before the document control function impacts on critical documents, and becomes material.

Noteworthy Observation: Hunter Water should be commended for identifying and raising the non-conformance because it demonstrates a sound culture for improvement, that is implemented in practice. So even though there is a shortcoming in the document control aspects of the QMS, other parts of the system are sound and fully implemented.

Recommendations

No recommendations were made.

Opportunities for improvement

No opportunities for improvement were identified.

Clause 5.7 – Provision of information to customers and the general public

Clause 5.7.1

Table 3-18 Clause 5.7.1 compliance grade

Subclause	Requirement	Compliance grade
5.7.1	<p>Hunter Water must prepare a pamphlet or pamphlets with the following information to Customers at least annually with their bills:</p> <ul style="list-style-type: none"> a) a brief explanation of the Customer Contract and a summary of the key rights and obligations of Customers under the Customer Contract; b) a brief explanation of the Procedure for Payment Difficulties and Actions for Non-payment; c) a brief explanation of rights of Customers to claim a rebate and the conditions that apply to those rights; d) information about the General Enquiry Process; e) information about how to make a Complaint under the Internal Complaints Handling Procedure; and f) a brief explanation of the external dispute resolution service, how to access that service, and Customers rights to have a Complaint or dispute referred to Energy and Water Ombudsman NSW. 	Non-compliant (non-material)

Risk

Failure to comply with this obligation means that customers may not be aware of their key rights and obligations, and how they can make general enquiries and complaints (including escalation to the Energy and Water Ombudsman New South Wales).

Target for full compliance

Evidence that Hunter Water has prepared a pamphlet or pamphlets with the following information:

- A brief explanation of the Customer Contract and a summary of the key rights and obligations of Customers under the Customer Contract
- A brief explanation of the Procedure for Payment Difficulties and Actions for Non-payment
- A brief explanation of rights of Customers to claim a rebate and the conditions that apply to those rights
- Information about the General Enquiry Process
- Information about how to make a Complaint under the Internal Complaints Handling Procedure
- A brief explanation of the external dispute resolution service, how to access that service, and Customers rights to have a Complaint or dispute referred to the Energy and Water Ombudsman New South Wales.

Evidence that Hunter Water has distributed the above pamphlet or pamphlets to Customers at least annually with their bills.

Summary of reasons for grade

Hunter Water has prepared pamphlets that meet the majority of the requirements of this clause. Hunter Water advised that these pamphlets are distributed with bills at least annually. Hunter Water provided as evidence a copy of each pamphlet and an example electronic bill issued in the audit period. However, these pamphlets do not contain information on actions for non-payment, as required by clause 5.7.1 (b).

This clause is graded Non-compliant (non-material). It is non-material because while the information on actions for non-payment is not in the pamphlet as required by the Licence, it is available on Hunter Water's website.

Discussion and notes

This clause requires that Hunter Water prepare a pamphlet or pamphlets with the following information to Customers at least annually with their bills:

- > A brief explanation of the Customer Contract and a summary of the key rights and obligations of Customers under the Customer Contract
- > A brief explanation of the Procedure for Payment Difficulties and Actions for Non-payment
- > A brief explanation of rights of Customers to claim a rebate and the conditions that apply to those rights
- > Information about the General Enquiry Process
- > Information about how to make a Complaint under the Internal Complaints Handling Procedure
- > A brief explanation of the external dispute resolution service, how to access that service, and Customers rights to have a Complaint or dispute referred to the Energy and Water Ombudsman New South Wales.

Hunter Water has prepared the following pamphlets that meet the above requirements:

- > *Customer Contract summary* – version distributed as part of the March to June 2021 billing cycle. This provides a summary of the Customer Contract and a summary of the key rights and obligations of Customers under the Customer Contract.
- > *Making Waves: November 20 – February 21* newsletter. This provides a summary of payment arrangement options (e.g., payment extensions, plans to manage payments, financial assistance or access to free financial counselling). However, this newsletter does not provide information on actions for non-payment, such as restrictions and legal action.
- > *Our customer rebates* – version distributed as part of the July to October 2020 billing cycle. This provides a summary of the rebates available and the conditions under which these rebates may be awarded.
- > *General Enquiries* – version distributed as part of the March to June 2021 billing cycle. This provides a summary of the methods through which a general enquiry can be submitted to Hunter Water.
- > *Complaints handling* – version distributed as part of the November 2020 to February 2021 billing cycle. This provides a summary of the complaints management process, including the external dispute resolution scheme. Within the summary of the external dispute resolution scheme, contact details are provided, as well as clarification that the scheme is a free service available to customers for any disputes they may have with Hunter Water.

Hunter Water advised that the above pamphlets are either distributed with bills annually as bill inserts or included as an article within cyclic newsletters which are distributed with cyclic bills. As evidence, Hunter Water provided to us an example electronic bill issued to a customer in the audit period, which includes links to the November 2020 – February 2021 *Making Waves* newsletter and the *Customer service delivery rebates* webpage on Hunter Water’s website. Therefore, each pamphlet is distributed at least annually. We confirmed that Hunter Water has also published this information on its website.

While Hunter Water has met the majority of the requirements of this clause through the above pamphlets, it has not provided information within these pamphlets on actions for non-payment (recommendation 2021/5.7.1-1). We note that this information is available on Hunter Water’s website, but that this clause requires that this information is provided with bills through a pamphlet or pamphlets. As such, we consider this clause to be non-compliant (non-material).

Recommendations

Recommendation 2021/5.7.1-1: By 30 September 2022, a brief explanation of actions for non-payment should be included in a pamphlet that is distributed with bills at least annually.

Opportunities for improvement

No opportunities for improvement were identified.

Clause 6.2 – Reporting manual

Clause 6.2.1

Table 3-19 Clause 6.2.1 compliance grade

Subclause	Requirement	Compliance grade
6.2.1	Hunter Water must comply with all of its reporting obligations set out in the Reporting Manual, including in relation to: <ul style="list-style-type: none"> a) water conservation; b) supply services and performance standards; c) organisational systems management; d) customer and stakeholder relations; and e) performance monitoring and reporting, including: <ul style="list-style-type: none"> i) IPART performance indicators; and ii) the National Water Initiative Performance Indicators. 	Non-compliant (non-material)
Risk	Target for full compliance	
Without accurate and timely information, there is a risk that the performance of Hunter Water against its Operating Licence requirements will not be known	Evidence that Hunter Water has provided all of its information for reporting and auditing as set out in the Reporting Manual and on time	

Summary of reasons for grade

A non-compliant (non-material) grade has been applied to this clause for the following reasons:

- > IPART was not notified of a proposed new CCP at Dungog WWTP at the time that NSW Health were notified of this proposal as required under Section 3.2.2 of the Reporting Manual. It is noted that Hunter Water self-reported this non-compliance.
- > The monthly water quality summary was not published on time in August 2021, as required under Clause 3.1.1 of the Reporting Manual.
- > There were a few sections of the Reporting and Monitoring Protocol where explanatory text incorrectly described the process. Provision of incorrect advice within such a document could result in Hunter Water not fully meeting its Reporting Manual obligations. This deficiency alone would not result in the grading of this clause as non-compliant. However, as per the above bullet points, two non-compliances were found to have occurred during the audit period. Therefore, this overall clause is graded non-compliant (non-material).

This clause is graded Non-compliant (non-material) as the deficiencies do not adversely impact Hunter Water's ability to achieve its service delivery objectives and assure controlled processes.

Discussion and notes

There were no proposed significant changes to the Drinking Water Quality Management System for most of the reporting period. On the 26 October, Hunter Water informed NSW Health of a proposed significant change to its risk management framework and Drinking Water Quality Management System. Hunter Water has previously had a "low" risk appetite in regards to water quality events that are likely to result in public health impacts. It had now decided to reduce its risk appetite to "as low as reasonably practicable" (ALARP). Hunter Water proposed to consult with NSW Health on appropriate implementation of this change.

Hunter Water is proposing one significant change to the Recycled Water Quality Management System, a new Critical Control Point (CCP) for the supply of recycled water from Dungog Wastewater Treatment Works. Hunter Water notified NSW Health of the proposed change to the Recycled Water Quality Management System in October 2020 and has liaised with NSW Health in relation to the development of the CCP and update of the Dungog RWQMP. NSW Health is currently reviewing the RWQMP. The CCP is currently in a draft format Hunter Water advised that it would not be implemented until NSW Health finalises its review. Section 3.2,2 of the Reporting Manual states that Hunter Water must notify IPART and NSW

Health of any significant changes that it proposes to make to the Drinking Water and Recycled Water Quality Management Systems. In this instance Hunter Water had not notified IPART of the revised CCP as they were awaiting NSW Health endorsement of the revised CCP. Hunter Water recognise that this notification should have occurred at the same time that NSW Health were notified and have listed this matter as a non-compliance in its Statement of Compliance 2020-21. It is recommended that Hunter Water set up a process to ensure that IPART, as well as NSW Health, are advised of any changes to Drinking Water and Recycled Water Quality Systems (recommendation 2021/6.2.1-1).

Hunter Water advised that there had been two recycled water CCP exceedances (exceeding the maximum flow specified in the RWQMP) at Dungog and Clarence town which had been reported to NSW Health. Copies of incident reports were provided. The CCP for flow rate is to ensure the flow is within the design envelope that the plant can achieve for the required recycled water quality for the end use. The exceedance at Dungog occurred after the plant was upgraded. The upgraded plant has more capacity and the CCP limits had been revised in an updated RWQMP for Dungog WWTW that had been submitted to NSW Health but was not implemented at the time of this incident. While the flow exceeded the CCP limit it did not exceed the capacity of the new plant and there is therefore no risk. For Clarence Town the flow limit is 252 kL/day and while irrigation was turned off when the flow reached 232 kL/day, by the end of the day it reached 280 kL/day. Clarence Town WWTW is a pond system and the daily flow restriction is to ensure there is sufficient residence time in the ponds. Given the flow on the day was only above the CCP limit by 11% the risk is considered to be minor given restricted public access to the irrigation area.

The Hunter Water Compliance Calendar for 2020/21 showed that all reporting commitments to IPART had been met from 1 November 2020 to 30 June 2021.

The Compliance Calendar for 2021/22 showed that reporting commitments to IPART had been met except for the following activity:

- > Monthly Water Quality Summary & publish on web (by second week of following month). This report was due on the 14/08/21 but not submitted until the 25/08/21. Clause 3.1.1. of the Reporting Manual requires that Hunter Water must report publicly on the Monthly Water Quality Monitoring Report by the 14th day of the following month. Hunter Water noted in the Calendar that the report was approved by the Group Manager on 12/08/21 however due to an administration error it was not uploaded until 25/08. It was noted that in the future the website will be reviewed on the 14th of each month to ensure that this report has been uploaded.

The process for managing the Compliance Calendar was described as:

- > Identify persons responsible
- > Save in TRIM
- > Notify persons responsible of upcoming compliance items due and outstanding items
- > Responses are saved in TRIM. Responsible persons are required to complete the Status, Date Completed, Completed by due date, and Evidence of Completion columns
- > Calendar is updated in TRIM

The above process also assists to identify changes in ownership (e.g., due to organisational restructure). During the audit we sighted new compliance calendar folder for each month in TRIM. We also sighted an email to persons responsible, notifying upcoming compliance items due/outstanding items. The email includes link to calendar and procedure. Previously, only three months of the calendar was provided at reminder, now, an entire year of the calendar is provided.

The Compliance Calendar addresses regular reporting requirements. As-required reporting is addressed through individual business area/ subject matter experts. The Group Manager Audit, Assurance & Management Systems reports on performance against the Compliance Calendar to the Audit and Risk Committee (ARC). However, performance on as-required reporting as-required reporting is not reported to ARC.

Hunter Water advised that centralisation of compliance requirements in Watershed, an integrated incident and risk management application, would reduce the risk of future CCP non-notification and water quality reporting deficiencies. As an interim measure, Hunter Water advised that the following actions will be implemented:

- > The Drinking Water and Recycled Water Quality Management System Manuals are being revised to include a definition of significant change to remove any ambiguity.
- > There will be increased vigilance to necessary reporting to ensure it is carried out in a timely manner.

We asked Hunter Water to provide evidence of their process for compliance reporting. We were advised that there is no formalised written procedure for preparing the Compliance and Performance Report (OFI 2021/6.2.1-1). An informal procedure was outlined in a response from Hunter Water. Hunter Water considered that there would be a limited benefit in formalising the process since there was low turnover in the regulatory team and procedures were well known to staff. The requirement is also in Hunter Water's corporate Compliance Calendar which safeguards against the requirement being somehow forgotten in any event.

We were provided with a copy of the Corporate Standard – Reporting and Monitoring Protocol. This document explains Hunter Water's protocols for collecting, interpreting, and extracting data for external reporting to meet Hunter Water's regulatory obligations. The Reporting and Monitoring Protocol document is limited to Hunter Water's regulatory reporting against the following requirements:

- > System Performance Standards in Hunter Water's Operating Licence
- > IPART Performance Indicators in Hunter Water's Operating Licence Reporting Manual
- > National Water Initiative (NWI) reporting for the National Performance Report (NPR) indicators published by the Bureau of Meteorology (BoM).

During our review of system performance standards and NPR reporting we noted the following in relation to the Reporting and Monitoring Protocol:

- > Under Processing of Uncontrolled Wastewater Overflow and multiple events (pages 35 and 40) the text seems to relate to water mains rather than sewers.
- > The text for Calculation Derivation and Hunter Water Interpretation for NPR Indicator A14 Sewer Main Breaks and Chokes is incorrect (page 69) as it refers to A10 – water loss.

Provision of incorrect advice within such a document could result in Hunter Water not fully meeting its Reporting Manual obligations. Hunter Water confirmed the noted errors and advised that the manual would be reviewed and updated once the BOM review of NPR reporting requirements was issued in later February 2022 (recommendation 2021/6.2.1-1).

Recommendations

Recommendation 2021/6.2.1-1: By 30 September 2022, a process should be set up to ensure that IPART, as well as NSW Health, are advised of any changes to Drinking Water and Recycled Water Quality Systems.

Recommendation 2021/6.2.1-2: By 30 September 2022, the Corporate Standard – Reporting and Monitoring Protocol should be reviewed and updated, following completion of the BOM review of NPR reporting in late February 2022.

There is no recommendation for the deficiency in not publishing the monthly water quality summary on time as Hunter Water has already addressed the deficiency.

Opportunities for improvement

OFI 2021/6.2.1-1 Consideration should be given to documenting the procedure for preparing the Compliance and Performance Report.

Clause 6.2.2

Table 3-20 Clause 6.2.2 compliance grade

Subclause	Requirement	Compliance grade
6.2.2	Hunter Water must maintain sufficient record systems to enable Hunter Water to report accurately in accordance with clause 6.2.1.	Compliant
Risk	Without adequate record systems in place it is likely that reporting commitments could be inaccurate or not timely.	Target for full compliance Formalised record systems are in place, reports provided on time and no evidence exists that reports have been inaccurate.

Summary of reasons for grade

A compliant grade has been applied to this clause.

Hunter Water has systems in place to meet its reporting obligations and no evidence exists to suggest that the reports provided are inaccurate.

This clause is graded as Compliant.

Discussion and notes

Hunter Water has a range of information systems in place to monitor and report performance and manage documents. Examples of these information management systems include TRIM (records management), PowerBI (information presentation), Envirosys (environmental data management), Ellipse (maintenance management), AOMS (maintenance management), GIS (spatial data), SCADA (operational data), Intergrum (compliance and risk management), various spreadsheet, intranet and internet sites. These systems enable Hunter Water to effectively meet its Reporting Manual obligations.

Throughout the audit we have reviewed the data and supporting processes provided to support compliance with the various clauses and found these to be satisfactory. The late submission of a water quality summary in August as mentioned in the text for Clause 6.2.1 has been explained as an administrative error rather than a record system deficiency.

The Compliance Calendar addresses regular reporting requirements. As-required reporting is addressed through individual business area/ subject matter experts. Hunter Water provided a Procedure – Notification of Water Quality Events of Potential Public Health Significance to NSW Health as evidence of a formalised process. Hunter Water advised that records of notifications are stored in a designated TRIM location and the incident is also recorded in Integrum for allocation of corrective action. A screen shot of 2021/22 reportable events was provided as evidence.

Hunter Water advised that they were implementing Watershed which is an integrated incident and risk management application to capture and manage governance, risk, compliance and incident information. This will become an integrated platform for the capture of as-required reporting and were aiming to develop integrated procedures, wherever possible for the different business areas to which as-required reporting applies. This is planned to happen in parallel with the implementation of the software solution. Hunter Water provided an excerpt from the Watershed Project Board Meeting of the 22 October 2021 which confirmed that the application had been procured in May 2021 and that full implementation would occur by the 20 August 2022.

Implementation of Watershed will allow The Group Manager Audit, Assurance & Management Systems to report on performance on both regular and as-required reporting to the ARC.

Recommendations

No recommendations were made.

Opportunities for improvement

No opportunities for improvement were identified, as improvement opportunity (Watershed) is already being implemented.

4 Previous recommendations

4.1 Recommendation 2019-06 (Clause 1.8.1) Pricing

Table 4-1 Recommendation 2019-06 (Clause 1.8.1) Pricing

Item	Detail
IPART's recommendation to the Minister	By 31 March 2021, Hunter Water must ensure that the proposed functionality for fully automated tankered waste billing is incorporated into the new corporate billing system.
Progress on audit findings as reported by utility on 27 May 2021	Work on this recommendation is still ongoing. Completion of this recommendation is dependent upon full implementation of Hunter Water's new billing system. Anticipate completion by 31 December 2021.
IPART guidance	Auditor to check for progress.
Audit finding	We were advised at the audit interview that the Automated Trade Waste Billing System went live on the 28 October 2021. Hunter Water subsequently confirmed that the system had gone live on the 28 October through the provision of screen shots from its Help Desk Portal.
Recommendation status	This recommendation is closed

4.2 Recommendation 2020-01 (Clause 3.1.2) Drinking water

Table 4-2 Recommendation 2020-01 (Clause 3.1.2) Drinking water

Item	Detail
IPART's recommendation to the Minister	By 30 June 2021, Hunter Water should ensure that minor drinking water quality incidents are all recorded as required by the Corporate Emergency Management Plan.
Progress on audit findings as reported by utility on 27 May 2021	To address this action, it is proposed to review, and prioritise improvements to drinking water quality incident documentation and ensure staff with water quality incident management responsibilities are aware of and adhere to the requirements within the documentation. Will be completed by 30 June 2021.
IPART guidance	Auditor to check for completion.
Audit finding	Hunter Water provided evidence (document control table, change date 24/9/21, approval date 8/10/21; version number and date on footer matched the document control table information; document changes stated were verified in the document) to show that procedure HW2006-2906 4 6.023 had been updated (notification to NSW Health – noting that this is a different number to the procedure queried in Element 6 of the drinking water clause), evidence to confirm that staff have been provided training in the incident reporting and other documentation and evidence to support reporting of water quality incidents to the water quality committee. The training sighted was comprehensive and included awareness notes throughout the document to focus attention on key aspects, however, it included a lot of information. Because of the large quantum of information, a query was made as to how participants had been assessed for their retention of the information. A formal assessment had not been completed however, evidence was provided to show how Hunter Water had communicated ongoing requirements to the awareness session attendees e.g. HW2015-1343/24/3.024 and ongoing communication through reporting to the water quality committee (HW2006-141734 8.006 Minutes - August 2021 Water Quality Committee). The evidence was accepted. A noteworthy observation is the new water quality incident management map that has been developed to link specific procedures – and facilitate understanding of requirements, as well as the draft rationalised triggers (for future consideration). Taken as a whole and

Item	Detail
	noting the ongoing commitment of Hunter Water to this area, the evidence supports closure of the recommendation.
Recommendation status	This recommendation is closed

4.3 Recommendation 2020-02 (Clause 3.2.1) Recycled water

Table 4-3 Recommendation 2020-02 (Clause 3.2.1) Recycled water

Item	Detail
IPART's recommendation to the Minister	By 31 October 2021, Hunter Water should ensure that the quality assurance and validation procedures for sampling are documented in its recycled water quality monitoring plan. The AGWR (Box 2.10) requires that quality assurance details are in a monitoring plan.
Progress on audit findings as reported by utility on 27 May 2021	Hunter Water's laboratory services provider, ALS, undertake the sampling for Hunter Water. Inclusion of ALS document references will be included in the Recycled Water Quality Monitoring Plan. Anticipate completion by 31 October 2021.
IPART guidance	Auditor to check for completion.
Audit finding	The document control table in the Corporate RWQMP states that inclusion of QA/QC procedure was included in the revision dated 12/10/2021. Section 5.3.1 includes requirement in ALS contract to use NATA accredited methods and references the sampling procedure. An extract from the contract with ALS shown in the QA/QC requirements including the methods required for each analysis was also provided. This requirement for QA/QC on analysis is not included in the Corporate RWQMS.
Recommendation status	We conclude that this recommendation is overdue and recommend it remain open

4.4 Recommendation 2020-03 (Clause 3.2.2) Recycled water

Table 4-4 Recommendation 2020-03 (Clause 3.2.2) Recycled water

Item	Detail
IPART's recommendation to the Minister	By 31 October 2021, Hunter Water should review the manner in which recycled water quality issues are documented and reported so as to ensure that they are managed and closed out in a consistent manner.
Progress on audit findings as reported by utility on 27 May 2021	Internal procedures are being reviewed to ensure that logging and management of events have clear allocation of actions and responsibilities. Anticipate completion by 31 October 2021.
IPART guidance	Auditor to check for completion.
Audit finding	Hunter Water have developed a Potable and Recycled Water Incident Map which includes a list of recycled water quality events, the action required including reporting to NSW Health
Recommendation status	This recommendation is closed

4.5 Recommendation 2020-04 (Clause 3.2.2) Recycled water

Table 4-5 Recommendation 2020-04 (Clause 3.2.2) Recycled water

Item	Detail
IPART's recommendation to the Minister	By 30 June 2021, Hunter Water should review the effectiveness of the Recycled Water Quality Management Plan at the Integrated Management System Review Meeting or at other appropriate senior management meetings.
Progress on audit findings as reported by utility on 27 May 2021	Completed. The Recycled Water Compliance function are now attending the Integrated Management System meetings and are working to integrate Recycled Water as part of Hunter Water's audits/assessments. Recycled Water Compliance attended Integrated Management System Meeting on 17 March 2021. The effectiveness of the QMS, including opportunities for improvement, were considered. Supporting documentation also considered recent audit outcomes and the update of the Recycled Water Policy.
IPART guidance	Auditor to check for completion.
Audit finding	Hunter Water provided evidence of the IMS management meeting on 26/4/2021, the IMS Quarterly Meeting on 19/4/2021 and the Recycled Water Activities and Quality Committee Meeting on 28/5/202. All of these meetings included discussion on recycled water management.
Recommendation status	This recommendation is closed

4.6 Recommendation 2020-05 (Clause 3.2.2) Recycled water

Table 4-6 Recommendation 2020-05 (Clause 3.2.2) Recycled water

Item	Detail
IPART's recommendation to the Minister	By 31 March 2021, Hunter Water should ensure that the Recycled Water Quality Management System Improvement Plan is monitored and improvement tasks are actioned in line with the plan.
Progress on audit findings as reported by utility on 27 May 2021	Completed. Internal Recycled Water meetings have been established which includes new reporting tools to better inform on upcoming tasks. First meeting was held 16th February 2021.
IPART guidance	Auditor to check for completion.
Audit finding	During the audit interviews Hunter Water described how the RWQMS Improvement Plan spreadsheet is used. The spreadsheet is saved within Content Manager where actions from risk assessments, audits and external stakeholders are entered. Due dates are agreed at the Recycled Water Activities and Compliance Committee meetings. The spreadsheet also includes a dashboard showing upcoming and overdue actions. Minutes of the Recycled Water Activities and Quality Committee Meeting on 28/5/202 showed discussion on upcoming and overdue items on the improvement plan.
Recommendation status	This recommendation is closed

4.7 Recommendation 2013-14-03, 2013-14-04, 2013-14-06, 2013-14-13 (Clause 3.2.1 and 3.2.2) Recycled water

Table 4-7 Recommendation 2013-14-03, 2013-14-04, 2013-14-06, 2013-14-13 (Clause 3.2.1 and 3.2.2) Recycled water

Item	Detail
IPART's recommendation to the Minister	<p>Within 6 months, Hunter Water should review Critical Control Points (CCPs) for each treatment plant, including:</p> <p>a) review all CCP critical limits (including alarm delays), and monitoring points to ensure they reflect current practice, as agreed with NSW Health. (Note: other elements of these recommendations had been fully addressed in previous audits)</p> <p>Completion of this recommendation requires the addition of two items (one remains outstanding) to the Recycled Water Quality Improvement Plan to meet NSW Health's conditions for approval of the final Validation Plan (i.e. the Validation Testing Program for Water Recycling Schemes).</p>
Progress on audit findings as reported by utility on 27 May 2021	<p>As noted in the recommendation, there are 2 outstanding issues which are required to close out this item. These relate to UVT Monitoring and validation of secondary treatment.</p> <p>Hunter Water is liaising with its service providers (Veolia and Water Futures) to close out these items.</p> <p>Anticipated completion of both is 30 June 2021.</p>
IPART guidance	Auditor to check for completion.
Audit finding	<p>Hunter Water have reviewed the SCADA alarms and delays have been reviewed by Veolia. During the audit site visit to Kurri Kurri WWTW the CCP limits and delays on SCADA were reviewed and found to be consistent with the RWQMP.</p> <p>Hunter Water have sought advice from Water Futures on the use of the 5th percentile and provided this information to NSW Health on 23/6/2021. Hunter Water had not received a response from NSW Health at the time of the audit.</p> <p>Hunter Water have also reviewed the CCP limits for UVT against the minimum criteria for the UV system to achieve the required LRV and provide this information to NSW Health on 30/6/2021. Hunter Water had not received a response from NSW Health at the time of the audit.</p>
Recommendation status	This recommendation is not complete and we recommend it remain open until NSW Health can comment on the information provided on UVT and the Validation Testing Program.

Appendix A – Evidence sighted

Clause 1.5 – Obligations to make services available

- > 1.5.1-E-001 - Attachment 1A - How To - DA Processing (NEW) after 15 August 2021.docx
- > 1.5.1-E-002 - Attachment 1B - Procedure - DA Processing (OLD) before 15 August 2021.docx
- > 1.5.1-E-003 - Attachment 1C - DA QA Screenshots Example 2020-1501 before 15 August 2021.docx
- > 1.5.1-E-004 - Attachment 2 - Development Assessment Performance 20-21.xlsx
- > 1.5.1-E-005 - Attachment 3 - Hunter Water Area of Operation GIS Demonstration.docx
- > 1.5.1-E-006 - Attachment 4 - Backlog Sewer - Final IPaRT Report 2018.pdf
- > 1.5.1-E-007 - Attachment 5 - Excerpt from 2018 IPaRT Determination.docx
- > 1.5.1-E-008 - Attachment 6 - Plan - Raworth Backlog sewer prelim concept.jpg
- > 1.5.1-E-009 - Attachment 7 - HW2010-952 16 6.001 - Raworth Backlog sewer - cost estimate.xlsx
- > 1.5.2-E-001 - Attachment 1A - How To - DA Processing (NEW) after 15 August 2021.docx
- > 1.5.2-E-002 - Attachment 1B - Procedure - DA Processing (OLD) before 15 August 2021.docx
- > 1.5.2-E-003 - Attachment 1C - DA QA Screenshots Example 2020-1501 before 15 August 2021.docx
- > 1.5.2-E-004 - Attachment 2 - GIS Excerpts PNO Area of Operation.docx
- > SE-012 Hunter H2O Sewer Learners Handbook_v1.5.pdf
- > SE-013 IPART AUDIT 2021 - 1.5.1 - Summary of Verbatim Customer Feedback June-September 2021.xlsx
- > SE-014 Copy of Raworth Backlog Sewer_Cost Estimate_Combined pressure and gravity service_v3.xlsx

Clause 1.8 – Pricing

- > 1.8.1-E-001 - Data - Price schedule 2021-22_FINAL.xlsx
- > 1.8.1-E-002 - Procedure - Price update procedure_2020-21 to 2023-24.DOTX
- > 1.8.1-E-003 - Plan - Release 8 RTM.XLSX
- > 1.8.1-E-004 - Report - IPart Charges 2021_2022 for Developer Services Test Summary Report.DOCX
- > 1.8.1-E-005 - Report - Velocity Release 8 - Test Summary Report.DOCX
- > 1.8.1-E-006 - WI - Update Charge Rate Values in Bulk.docx
- > 1.8.1-E-007 - Bill Validation - Scenarios - Cycle 2 20_21.xlsx
- > 1.8.1-E-008 - 10082518 Statement 999999659030 GBI0057 Example_57.pdf
- > 1.8.1-E-009 - 10191286 Statement 999999739016 GBI0057 Example 17.pdf
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- > 1.8.1-E-012 - Validation 09.11.20.xlsx
- > 1.8.1-E-013 - Vailidation 11.11.20.xlsx
- > 1.8.1-E-014 - Vailidation 13.11.20.xlsx
- > 1.8.1-E-015 - Validation 06.11.20.xlsx
- > 1.8.1-R 2019-06-E-001 - Business Rules - Trade Waste Billing Procedures.docx
- > 1.8.1-R 2019-06-E-002 - SOP - Process Liquid Waste Carrier Application Link.docx
- > 1.8.1-R 2019-06-E-003 - Robotic Process Automation - Liquid Trade Waste.pdf

- > 1.8.1-R 2019-06-E-004 - Automated Tradewaste Billing - Test Execution Cases.pdf
- > SE-015 Hunter Water - Final IPART Determination.pdf
- > SE-016 (1.8.1) Daily Validations.DOCX
- > SE-072.docx
- > SE-077 Recommendation 2019-06.msg

Clause 3.1 – Drinking water

- > Interview with Integrated Systems Manager and Manager Water Treatment Operations (LTP), 2 November 2021
- > Interview with DWQMS Team Lead, 2 November 2021
- > Site visit and interview with treatment operations contract personnel at Lemon Tree Passage water treatment plant, 3 November 2021
- > PA-DW-002-List of drinking water quality incidents.xlsx
- > PA-DW-003-HW2007-900 27 19.003 Corporate Emergency Management Plan June 2021.docx
- > PA-DW-004-PRO-2803-1 HW - Incident and Emergency Response Procedures.pdf
- > PA-DW-005-List of operational procedures.xlsx
- > PA-DW-006-CCP Instruments at Gresford and Lemon Tree Passage WTPs.xlsx
- > PA-DW-007-TEM-2860-1 HW - Lemon Tree Passage WTP Site Manifest.pdf
- > PA-DW-008-TEM-2896-2 HW - Gresford WTP Site Manifest.pdf
- > PA-DW-009-HW2014-778 15 2.007 Register - Gresford WTP CCP Limit Table.PDF
- > PA-DW-010-HW2014-778 15 2.008 Register - Lemon Tree Passage WTP CCP Limit.PDF
- > 1 PA-DW-001-HW2015-1303 9.001 Hunter Water Drinking Water Quality Management System.pdf
- > 3.1.1-E-002 - HW2015-1303 9.001 Hunter Water Drinking Water Quality Management System Manual .pdf
- > 3.1.1-E-003 - HW2015-1444 5.008 Report - DWQMS Manual Update Process Report.pdf
- > 3.1.1-E-004 - HW2014-778 15 2.002 Plan - Drinking Water Quality Management Plan.pdf
- > 3.1.1-E-006 - HW2006-1448 61 4.015 Minutes - Hunter Water NSW Health Liaison Committee Meeting - 2 June 2021.DOCX
- > 3.1.2-E-001 - HW2015-1303 9.001 Hunter Water Drinking Water Quality Management System Man.pdf
- > 3.1.2-E-002 - HW2014-778 15 2.002 Plan - Drinking Water Quality Management Plan.pdf
- > 3.1.2-R 2020-01-E-001 - HW2006-2906 4 6.023 Procedure - Notification of Water Quality Events of Potential Public Health.DOCX
- > 3.1.2-R 2020-01-E-002 - HW2015-1343 24 3.022 Presentation - WQ incident awareness session.pdf
- > 3.1.2-R 2020-01-E-003 - Potable and Recycled Water Incident Response Map_V002.pdf
- > 3.1.2-R 2020-01-E-004 - HW2006-1417 34 9.012 Minutes - September 2021 Water Quality Comm.DOCX
- > 3.1-ADWG-01-E-001 - HW2011-662 14 5.002 Emergency Response Communications Plan.DOCX
- > 3.1-ADWG-01-E-002 - HW2014-1242 4 2.007 2021 Register - Business Resilience Yearly Event Calendar Schedule.xlsx
- > 3.1-ADWG-01-E-003 - HW2013-421 9.006 Register - Legal and Other Requirements - Quality.XLSX
- > 3.1-ADWG-01-E-004 - HW2012-441 23 1.029 Procedure – Managing Legal and Other Requirements.docx
- > 3.1-ADWG-01-E-005 - Photos of DWQ Policy at Gresford and LTP WTPs.xlsx
- > 3.1.1-E-001 - HW2006-2968 41 44.001 Policy - Drinking Water.PDF
- > 3.1-ADWG-02-E-001 - HW2008-704 17.004 Enterprise Risk Management Standard.DOCX

- > 3.1-ADWG-02-E-002 - HW2015-1303 6.002 Catchment to Tap Water Quality Risk Assessment Guideline.DOCX
- > 3.1-ADWG-02-E-003 - Flow Diagram Checklist for LTP WTP Flow Diagram.docx
- > 3.1-ADWG-02-E-004 - Flow Diagram Checklist for Gresford WTP Flow Diagram.docx
- > 3.1-ADWG-02-E-006 - HW2015-1365 16.002 Plan - Flow Diagram - Lemon Tree Passage Water Supply System.PDF
- > 3.1-ADWG-02-E-006 - HW2015-1365 16.003 Plan - Flow Diagram - Gresford W.PDF
- > 3.1-ADWG-02-E-007 - HW2015-705 1.005 Plan - Lemon Tree Passage WTP - Flow Diagram.PDF
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- > 3.1-ADWG-02-E-009 - S09-13161.005 File note - HWC Water Supply Zones - Detail System Schematic 2017.PDF
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- > 3.1-ADWG-03-E-001 - HW2015-1303 10.003 Register - Network Chlorinators CCP Limit Table.pdf
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- > 3.1-ADWG-04-E-001 - Standard-STS-408-Water-Quality-Acceptance-Testing.pdf
- > 3.1-ADWG-04-E-002 - Amoeba Data - Audit 2021 - LTP_Gresford_20-21.xlsx
- > 3.1-ADWG-04-E-003 - Calibration Records for LTP WTP AD.xlsx
- > 3.1-ADWG-04-E-003 - Calibration Records for LTP WTP.xlsx
- > 3.1-ADWG-04-E-004 - SDS Register - LTP WTP.xlsx
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- > 3.1-ADWG-04-E-007 - Certificate of Analysis - Hydrated Lime and Cationic Floquot FL.pdf
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- > 3.1-ADWG-04-E-009 - Certificate of Analysis - Hydrated Lime January 202.pdf
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- > 3.1-ADWG-04-E-012 - HW2015-1469 7 4.008 Standard - Customer Complaints Handling.docx
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- > 3.1-ADWG-04-E-014 - HW2006-2906 4 6.009 Guideline - Blue-Green Algae Alert Level Framework - Potable Water.pdf
- > 3.1-ADWG-04-E-015 - HW2006-1897.027 Agreement - Copy of Original Hunter Central Coast Pipeline Agreement - .pdf

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- > 3.1-ADWG-04-E-017 - Dec 20, Mar 21, June 21 - LTP and Gresford WQ resu.xlsx
- > 3.1-ADWG-04-E-018 - HW2006-1417 34 10.002 Email - Requests from MidCoas.msg
- > 3.1-ADWG-04-E-019 - Algae data extract.docx
- > 3.1-ADWG-05-E-001 - HW2018-604 1 6.005 Working Paper - Hunter Water Strategy for Management of Naegleria fow.pdf
- > 3.1-ADWG-06-E-001 - HW2010-1986 8.023 Procedure - Water Quality Exception Reporting – CURRENT.DOCX
- > 3.1-ADWG-06-E-002a - Procedure - PN201 – Water Quality Incident Procedure - Notification.PDF
- > 3.1-ADWG-06-E-002b - PN111 – Drinking Water Standards.PDF
- > 3.1-ADWG-06-E-003 - Contact List LTP WTP - TEM-2802-7 Emergency Contact.pdf
- > 3.1-ADWG-06-E-004 - ASNN-1AD7FE Integrum Record.pdf
- > 3.1-ADWG-06-E-005 - ASNN-328DC8 Integrum Record.pdf
- > 3.1-ADWG-06-E-006 - ASNN-F338BA Integrum Record.pdf
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- > 3.1-ADWG-10-E-002 - HW2013-421 22.002 Standard - Integrated Management System Document Management.DOCX
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- > 3.1-ADWG-10-E-004 - BCS2021-9-04 2.004 Committee Paper - Water Quality Risk Manage.DOCX
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- > 3.1-ADWG-10-E-011 - HW2015-1443 1 7.001 Report - Drinking Water Quality Improvement Plan July 2021.pdf
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- > 3.1-ADWG-10-E-013 - HW2006-1417 34 8.007 Presentation - WTP Monthly Performance - .pdf
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- > 3.1-ADWG-11-E-001 - HW2013-421 11.003 Procedure - 2LOD Integrated Management System Audits.DOCX
- > 3.1-ADWG-11-E-002 - HW2013-421 9.001 Register - 2LOD IMS Audit Programme – CURRENT.XLSX
- > 3.1-ADWG-11-E-003 - HW2015-1343 24 3.007 Report - HWC2011 LTP Gresford audit report v2.0.PDF
- > 3.1-ADWG-11-E-004 - HW2010-561 16 2.001 Report - Lemon Tree Passage WTP Site Inspection - 22nd June 2021.pdf
- > 3.1-ADWG-11-E-005 - HW2011-1146 15.001 Report - Gresford WTP Site Inspection - 7 September 2021.pdf
- > 3.1-ADWG-12-E-001 - HW2006-2906 10 2.005 Drinking Water Quality Improvement Plan EXTRACT .pdf
- > SE-001a HW2006-1417 34 5.011 ADWG 2021 Update - Guidance on Short Term Exposure Values.PPTX
- > SE-001b Register - Legal and Other Requirements - Quality - CURRENT XLSX.msg
- > SE-002 Draft Notification Protocol between Central Coast Council and Hunter Water 20211101.docx
- > SE-003 Managing Resourcing.docx
- > SE-004 HW2015-1444 3.001 Procedure - Establishing and Reviewing Drinking Water Critical Control Points.DOCX
- > SE-005 HW2015-134324 3.024 Minutes - Drinking Water Quality Incident Management Awareness Session 28th June 2021.DOCX
- > SE-006 HW2006-141734 8.006 Minutes - August 2021 Water Quality Committee.DOCX
- > SE-009a TRIM record of review-approval DWQ Policy.png
- > SE-009b Integrum Screenshot DWQ Policy Issue of approved document.png
- > SE-009c Approved Quality Policy.msg
- > SE-009d Policy - Quality Approved signed document.pdf
- > SE-009e Review Submission for Quality Policy.msg
- > SE-010a NATA Chemical Letter.pdf
- > SE-010b NATA Micro letter.pdf
- > SE-026 Watershed - Excerpt from Project Board meeting re Schedule.pdf
- > SE-033 ALS contract Excerpt re QA QC.PDF
- > SE-041b Organisation Structure for Science and Inovation.png
- > SE-041c 20201120 SME Coalition Sprint Brief - CI2 Innovation Spectrum Concept (v4).pdf
- > SE-042 MAN-2968-2 HW - Lemon Tree Passage WTP.pdf
- > SE-043 PN111 - Drinking Water Standards.PDF
- > SE-057 Procedure - Monthly Water Quality Summary Reporting Procedure.DOC
- > SE-058 Proposed significant change to DWQMS introduction of 'ALARP'.msg
- > SE-059.docx
- > SE-063 LHAG-79FDEA - NCR Systemic Document Control Failure.pdf
- > SE-066 Additional Info for IPART Audit - 23rd Nov 2021.docx
- > SE-067a RE EXTERNAL - FW IPART Audit - Proof of Currency of ALS NATA Accreditation.msg
- > SE-067b Tabular Results Data.msg
- > SE-067c SYMBIO LABORATORIES REPORT S1003942 YOUR REFERENCE Hunter Water.msg
- > SE-067d SYMBIO LABORATORIES REPORT B964982 YOUR REFERENCE Water.msg

- > SE-067e SYMBIO LABORATORIES REPORT B964982-A YOUR REFERENCE Water.msg
- > SE-067f SYMBIO LABORATORIES REPORT S986779 YOUR REFERENCE Hunter Water.msg
- > SE-067g SYMBIO LABORATORIES REPORT S1075892 YOUR REFERENCE Hunter Water.msg
- > SE-067h SYMBIO LABORATORIES REPORT S1025226 YOUR REFERENCE Hunter Water.msg
- > SE-067i SYMBIO LABORATORIES REPORT S1051771 YOUR REFERENCE Hunter Water.msg
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- > SE-068 Item 4.6 - State of the Assets 2021 (Investment Committee meeting 22 Sep 2021).pdf
- > SE-069 Minutes - Audit & Risk Committee meeting [approved & signed] - 18 Mar 20....pdf
- > SE-074a 3 - TEM-2844 HW - Chemical Delivery Work Permit - Aluminium Sulphate.pdf
- > SE-074b Fluorosilicic Acid C of A March 2021.pdf
- > SE-074c Fluorosilicic Acid C of A September 2021.pdf
- > SE-074d Non-Ionic Poly C of A Poly November 2020.pdf
- > SE-074e PolyDADAMAC C of A November 2020.pdf
- > SE-074f PolyDADAMAC C of A August 2021.pdf
- > SE-074g SP032867 Analysis on IXOM Laverton Liquid Chlorine December 2020 - AWWA Conformance.pdf
- > SE-073 Lemon Tree Passage CCP Limit Table Identified Discrepancies.docx
- > SE-075 Procedure - Notification Protocol between MidCoast Council and Hunter Water 20210305.DOCX

Clause 3.2 – Recycled water

- > 3.1.1-E-006 - HW2006-1448 61 4.015 Minutes - Hunter Water NSW Health Liaison Committee Meeting - 2 June 2021.DOCX
- > 3.1.2-R 2020-01-E-001 - HW2006-2906 4 6.023 Procedure - Notification of Water Quality Events of Potential Public Health.DOCX
- > 3.1.2-R 2020-01-E-002 - HW2015-1343 24 3.022 Presentation - WQ incident awareness session.pdf
- > 3.1.2-R 2020-01-E-003 - Potable and Recycled Water Incident Response Map_V002.pdf
- > 3.2.1-AGWR 01-E-001 - Kurri Kurri WWTW Recycled Water Quality Management Plan.DOCX
- > 3.2.1-AGWR 01-E-002 - Cessnock WWTW Recycled Water Quality Management Plan.docx
- > 3.2.1-AGWR 01-E-003 - Corporate Recycled Water Quality Management Plan.docx
- > 3.2.1-AGWR 01-E-004 - Screen shot RWQMS and Improvement Plan – risk review.docx
- > 3.2.1-AGWR 01-E-005 - Asset Assurance Team - Plan on a Page - Master File.pptx
- > 3.2.1-AGWR 01-E-006 - RWQMS Screen shot - stakeholder responsibilities.pdf
- > 3.2.1-AGWR 01-E-007 - RWQMS Screen shot - End user communication.docx
- > 3.2.1-AGWR 01-E-008 - Practice Note 102 - Operator Competency.PDF
- > 3.2.1-AGWR 01-E-009 - Veolia Training Qual Monthly Report Excerpt.docx
- > 3.2.1-AGWR 01-E-010 - Managing Legal and Other Requirements.docx
- > 3.2.1-AGWR 01-E-011 - Quality legal and other requirements register.xlsx
- > 3.2.1-AGWR 01-E-012 - Dungog WWTW site inspection May 2021 - attendance.jpg
- > 3.2.1-AGWR 01-E-013 - Dungog WWTW site inspection May 2021.xlsx
- > 3.2.1-AGWR 01-E-014 - Kurri Kurri TAFE recycled water agreement.pdf
- > 3.2.1-AGWR 01-E-015 - Kurri Kurri TAFE RW Customer Contract Extension Letter October 2021.PDF
- > 3.2.1-AGWR 01-E-016 - Kurri Golf Club recycled water agreement.pdf

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- > 3.2.1-AGWR 01-E-019 - Cessnock Golf Course RW Customer Contract Extension Letter October 2021.pdf
- > 3.2.1-AGWR 01-E-020 - Manager Water Network Operations PD.pdf
- > 3.2.1-AGWR 01-E-021 - Manager Wastewater Treatment Operations PD.pdf
- > 3.2.1-AGWR 01-E-022 - Team Leader Alternative Water PD.DOC
- > 3.2.1-AGWR 01-E-023 - HW RWM - Minutes Dec 2020 Jan 2021.docx
- > 3.2.1-AGWR 01-E-024 - Recycled_Water_Awareness_ Online Training register.xls
- > 3.2.1-AGWR 01-E-025 - Screen shot of HW online recycled water awareness training.docx
- > 3.2.1-AGWR 01-E-026 - Screen shot of HW recycled water webpage.docx
- > 3.2.1-AGWR 01-E-027 - TEM-6719 HW - Skills and Competency Matrix for Operations Staff.xlsx
- > 3.2.1-AGWR 01-E-028 - OPERATOR TRAINING - CESSNOCK AND KURRI KURRI WWTW.xlsx
- > 3.2.1-AGWR 01-E-029 - Veolia Training Matrix.pdf
- > 3.2.1-AGWR 01-E-030 - Veolia Recycled Water Training.pptx
- > 3.2.1-AGWR 01-E-031 - Example of correspondence with Kurri Kurri TAFE.msg
- > 3.2.1-AGWR 01-E-032 - Annual reminder Commercial Recycled Water Cross Connection Inspection.PDF
- > 3.2.1-AGWR 01-E-033 - Annual reminder Commercial RW Cross Connection Inspection follow up.PDF
- > 3.2.1-AGWR 01-E-034 - Recycled Water Policy - 2020-2023.pdf
- > 3.2.1-AGWR 02-E-001 - Cessnock WWTW risk assessment.xlsm
- > 3.2.1-AGWR 02-E-002 - Cessnock WWTW risk assessment briefing paper.doc
- > 3.2.1-AGWR 02-E-003 - Cessnock WWTW risk workshop summary.doc
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- > 3.2.1-AGWR 02-E-007 - Corporate risk driver analysis summary - Inability to manage recycled w.docx
- > 3.2.1-AGWR 02-E-008 - Consolidated recycled water scheme risk 2021.xlsx
- > 3.2.1-AGWR 02-E-009 - Screen shot RWQMS and Improvement Plan – planning and construction.docx
- > 3.2.1-AGWR 02-E-010 - MAN-3070-2 HW - Cessnock WWTW RWQMP.docx
- > 3.2.1-AGWR 02-E-011 - MAN-3076-2 HW - Kurri Kurri WWTW RWQMP.docx
- > 3.2.1-AGWR 02-E-012 - Dual reticulation risk assessment 2021.xlsx
- > 3.2.1-AGWR 02-E-013 - HACCP Report_Chisholm Gillieston Heights Aug 2021.pdf
- > 3.2.1-AGWR 02-E-014 - Dungog WWTW risk assessment - October 2020.xlsm
- > 3.2.1-AGWR 02-E-015 - Dungog recycled water risk workshop briefing presentation.pptx
- > 3.2.1-AGWR 02-E-016 - Dungog WWTP Upgrade NSW Health Memo (NSW Health Issue).pdf
- > 3.2.1-AGWR 02-E-017 - Email to Health - Dungog WWTW_Process Tracking_final effluent RWQMP.msg
- > 3.2.1-AGWR 02-E-018 - Dual Retic Thornton North Connection NSW Health Briefing Paper.pdf
- > 3.2.1-AGWR 02-E-019 - Dual Reticulation Risk Assessment 9th June 21 Meeting Agenda.docx
- > 3.2.1-AGWR 02-E-020 - Morpeth RWTP long term analysis.xlsx
- > 3.2.1-AGWR 02-E-021 - Farley RWTP long term analysis.xlsx
- > 3.2.1-AGWR 02-E-022 - Cessnock operational Worksheet.xlsb

- > 3.2.1-AGWR 02-E-023 - Kurri Kurri operational Worksheet.xlsb
- > 3.2.1-AGWR 02-E-024 - Cessnock RW quality trends.xlsx
- > 3.2.1-AGWR 02-E-025 - Kurri Kurri RW quality trends.xlsx
- > 3.2.1-AGWR 02-E-026 - Screen shot RWQMS - communication.docx
- > 3.2.1-AGWR 02-E-027 - Kurri Kurri WWTW risk assessment - risk uncertainty example.docx
- > 3.2.1-AGWR 03-E-001 - Recycled Water Report 20211006.xlsx
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- > 3.2.1-AGWR 03-E-003 - PN110 - Recycled Water Standards - v5 Aug 2019.pdf
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- > 3.2.1-AGWR 03-E-009 - 0692-RW-DUNww.pdf
- > 3.2.1-AGWR 04-E-001 - MAN-2956-2 HW - Cessnock WWTW Plant Operating Manual.pdf
- > 3.2.1-AGWR 04-E-002 - MAN-2967-2 HW - Kurri Kurri WWTW Plant Operating Manual.pdf
- > 3.2.1-AGWR 04-E-003 - VAMS FAR Product Water Tank Inspection.pdf
- > 3.2.1-AGWR 04-E-004 - VAMS MOR Product Water Tank Inspection.pdf
- > 3.2.1-AGWR 04-E-005 - Chisholm PotableLilacPipe DBYD.pdf
- > 3.2.1-AGWR 04-E-006 - Chisholm PotableLilacPipe GIS.PNG
- > 3.2.1-AGWR 04-E-007 - Presentation - Recycled Water Dual Reticulation Awareness Training Fina.PPTX
- > 3.2.1-AGWR 04-E-008 - Work Instruction - 001 - Working on Potable Water Mains and Fittings.DOCX
- > 3.2.1-AGWR 04-E-009 - Veolia Document Control and Access for Operators - Hunter Water Portal.docx
- > 3.2.1-AGWR 04-E-010 - Recycled Water Quality Monitoring and Communication.docx
- > 3.2.1-AGWR 04-E-011 - TEM-2910 HW - Cessnock WWTW Sampling Guide Sheet.pdf
- > 3.2.1-AGWR 04-E-012 - TEM-2918 HW - Kurri Kurri WWTW Sampling Guide Sheet.pdf
- > 3.2.1-AGWR 04-E-013 - TEM-2883-4 Cessnock WWTW Sampling Calendar.pdf
- > 3.2.1-AGWR 04-E-014 - TEM-2879 HW - Kurri Kurri WWTW Sampling Calendar 2021.pdf
- > 3.2.1-AGWR 04-E-015 - Recycled Water Quality Incident Response.docx
- > 3.2.1-AGWR 04-E-016 - Dungog WWTW – CLAN-2D9F4D.docx
- > 3.2.1-AGWR 04-E-017 - Clarence Town WWTW – CLAN-B1BA5F.docx
- > 3.2.1-AGWR 04-E-018 - VAMS CES TTP Raw Flow Calibration.pdf
- > 3.2.1-AGWR 04-E-019 - VAMS KUR UVT Calibration.pdf
- > 3.2.1-AGWR 04-E-020 - VAMS Cessnock Monthly Work Orders OCT.pdf
- > 3.2.1-AGWR 04-E-021 - VAMS Kurri Monthly Work Orders OCT.pdf
- > 3.2.1-AGWR 04-E-022 - TEM-12400 HW - Reservoir Inspection.xlsx
- > 3.2.1-AGWR 04-E-023 - HW website - approved products.docx
- > 3.2.1-AGWR 04-E-024 - WIS-2976 Aluminium Sulphate Solution Ordering, Delivery and Testing.pdf
- > 3.2.1-AGWR 04-E-025 - WIS-2980 HW - Ferrous Chloride Solution (Spent Pickling Paste) - Ordering, Deli.pdf
- > 3.2.1-AGWR 04-E-026 - WIS-2983 HW - Powder Polymer Ordering and Delivery.pdf

- > 3.2.1-AGWR 04-E-027 - WIS-2985-2 HW - Sodium Hydroxide (Caustic Soda) Solution Ordering, Deli.docx
- > 3.2.1-AGWR 05-E-001 - Integrum screen shot - RW log.docx
- > 3.2.1-AGWR 05-E-002 - Call centre Guideline - DAY 2 Basic Recycled Water.PPTX
- > 3.2.1-AGWR 05-E-003 - Call centre Guideline - Recycled Water Quick Guide.docx
- > 3.2.1-AGWR 05-E-004 - Call centre Competency Assessment Form - Customer Service - Basic Level.docx
- > 3.2.1-AGWR 05-E-005 - Hunter Water Customer Contract.pdf
- > 3.2.1-AGWR 05-E-006 - MCR CS0341 - August 2021.pdf
- > 3.2.1-AGWR 05-E-007 - Hunter Water NSW Health Liaison Committee Meeting - 2 June 2021.docx
- > 3.2.1-AGWR 05-E-008 - Recycled Water Activities and Compliance Meeting - Q1 2021 Draft.docx
- > 3.2.1-AGWR 05-E-009 - CES CCP SCADA Screen shot.pdf
- > 3.2.1-AGWR 05-E-010 - KUR CCP SCADA Screen shot.pdf
- > 3.2.1-AGWR 05-E-011 - Corporate Mail - Fwd_ Recycled Water Quality Report 06_10_2021.pdf
- > 3.2.1-AGWR 05-E-012 - Recycled Water Report 20211006 (1).xlsx
- > 3.2.1-AGWR 05-E-013 - PRO-2803 HW - Incident and Emergency Response Procedures.pdf
- > 3.2.1-AGWR 05-E-014 - WWTW CCP and EPA Compliance Alarms Report.pdf
- > 3.2.1-AGWR 09-E-001 - WWTW CCP and EPA Compliance Alarms-Monthly Report.xls
- > 3.2.1-AGWR 09-E-002 - WWTW Recycled Water Existing Schemes Validation Program.docx
- > 3.2.1-AGWR 09-E-003 - Hunter Water NSW Health Liaison Committee Meeting - 3 March 2021.docx
- > 3.2.1-AGWR 09-E-004 - Hunter Water NSW Health Liaison Committee Meeting - 2 December 2020.docx
- > 3.2.1-AGWR 10-E-001 - TRIM part 1 session - email to participants.msg
- > 3.2.1-AGWR 10-E-002 - TRIM_Training_Records_(Oct_21)_20211007.xls
- > 3.2.1-AGWR 10-E-003 - Training Material - Basic Session - Mandatory TRIM Training.docx
- > 3.2.1-AGWR 10-E-004 - Training Material - Advanced Session - Mandatory TRIM Training.docx
- > 3.2.1-AGWR 10-E-005 - Corporate Mail - Recycled Water Quality Report 06_01_2021.pdf
- > 3.2.1-AGWR 10-E-006 - Recycled Water Report 20210105.xlsx
- > 3.2.1-AGWR 10-E-007 - Corporate Mail - Recycled Water Quality Report 13_01_202.pdf
- > 3.2.1-AGWR 10-E-008 - Recycled Water Report 20210113.xlsx
- > 3.2.1-AGWR 10-E-009 - Corporate Mail - Recycled Water Quality Report 20_01_2021.pdf
- > 3.2.1-AGWR 10-E-010 - Recycled Water Report 20210120.xlsx
- > 3.2.1-AGWR 10-E-011 - Corporate Mail - Recycled Water Quality Report 27_01_2021.pdf
- > 3.2.1-AGWR 10-E-012 - Recycled Water Report 20210127.xlsx
- > 3.2.1-AGWR 11-E-001 - RWQMS improvement radar screen shot.docx
- > 3.2.1-AGWR 11-E-002 - RWQMS improvement items screen shot.docx
- > 3.2.1-AGWR 11-E-003 - Hunter Water - Compliance and Performance Report 2020-21.pdf
- > 3.2.1-AGWR 12-E-001 - RWQMS improvements items for Cessnock and Kurri screen shot.docx
- > 3.2.1-AGWR 12-E-002 - Presentation - RWQIP Update March 2021 NSW Health Liaison Meeting.pptx
- > 3.2.1-R 2013 14-E-001 - Email to NSW Health - 5%ile statistic for recycled water scheme valid.msg
- > 3.2.1-R 2013 14-E-002 - Email NSW Health - Improvement Item Response Regarding UVt.msg
- > 3.2.1-R 2013 14-E-003 - OFI-HWC-2020-11Combination.pdf

- > 3.2.1-R 2013 14-E-004 - IPART Audit Response UVT 2020.pdf
- > 3.2.1-R 2013 14-E-005 - UVT Data Review 2014 to 2020.xlsx
- > 3.2.1-R 2020-02-E-001 - Corporate Recycled Water Quality Management Plan.docx
- > 3.2.1-R 2020-03-E-001 - Potable and Recycled Water Incident Response Map.pdf
- > 3.2.1-R 2020-04-E-001 - MRM-2021-04-26 - IMS Management Review MOM&Record 2021.PDF
- > 3.2.1-R 2020-04-E-002 - IMS Management Review Meeting_presentation slides - April 2021.PPTX
- > 3.2.1-R 2020-04-E-003 - Minutes - IMS System Representative Quarterly Meeting_190421 - April.DOCX
- > 3.2.1-R 2020-04-E-004 - Agenda - IMS Quarterly Meeting - April 2021.DOCX
- > 3.2.1-R 2020-04-E-005 - Recycled Water Activities and Compliance Meeting - Q1 2021 Draft.docx
- > 3.2.1-R 2020-04-E-006 - HW Organisation Chart - Audit, Assurance and Systems.docx
- > 3.2.1-R 2020-05-E-001 - Hunter Water NSW Health Liaison Committee Meeting - 2 December 2020.docx
- > 3.2.1-R 2020-05-E-002 - Hunter Water NSW Health Liaison Committee Meeting - 3 March 2021.docx
- > 3.2.1-R 2020-05-E-003 - Presentation - RWQIP Update March 2021 NSW Health Liaison Meeting_fin.pptx
- > 3.2.1-R 2020-05-E-004 - RWQMP Improvement Plan Report NSW Health Jan 2021.docx
- > 3.2.1-R 2020-05-E-005 - Recycled Water Activities and Compliance Meeting - Q1 2021 Draft.docx
- > 4.2.1-E-004 - Register - 2LOD IMS Audit Programme - CURRENT.XLSX
- > PA-RW-002-Plan - Cessnock WWTW Recycled Water Quality Management Plan - Current.DOCX
- > PA-RW-004-Plan - Kurri Kurri WWTW Recycled Water Quality Management Plan - Current.DOCX
- > PA-RW-005 Plan - Corporate Recycled Water Quality Management Plan - DB update.DOCX
- > Report - Hunter Water - Compliance and Performance Report 2020-21.pdf
- > SE-035a Bulk Chemical Specification Hunter 201910.pdf
- > SE-035b Generic Sodium Hypochlorite May-Jun 21-0881-18.pdf
- > SE-036 screen shot Product Specifications.docx
- > SE-037a Corporate Mail - Dora Creek Recycled Water Quality Report 20_10_2021.pdf
- > SE-037b Dora Creek Recycled Water Report20211020.xlsx
- > SE-038 Recycled Water Inspection Form (Agricultural Municipal) - CURRENT.XLTX
- > SE-039a eNews and your IMT update_ Tuesday 20 July 2021.msg
- > SE-039b IMT Update - Friday 6 August 2021.msg
- > SE-039c IMT Update - Friday 23 July 2021.msg
- > SE-039d IMT Update - Thursday 5 August 2021.msg
- > SE-039e IMT Update - Wednesday 7 July 2021.msg
- > SE-039f IMT Update - Wednesday 15 July 2021.msg
- > SE-039g HW2020-313 8 13_003 Report - Situation Report No 8 - 24 Mar 2020.msg
- > SE-039h FW_ Coronavirus COVID-19 Update 23 March 2020.msg
- > SE-040a Corporate Mail - COVID-19 NSW 160821 update.pdf
- > SE-040b Corporate Mail - COVID-19 NSW 208021 update.pdf
- > SE-040c Corporate Mail - NSW HEALTH - Know the new restrictions for where you live.pdf
- > SE-040d COVID-19 - Hunter Water Portal.pdf
- > SE-041a Report - The probability of cysticercus bovis detection in livestock from exposure to recycled water in non-endemic countries.pdf

- > SE-041b Organisation Structure for Science and Innovation.png
- > SE-054+055 BelmontWorksheet.xlsb
- > SE-054+055 BoulderBayWorksheet.xlsb
- > SE-054+055 BranxtonWorksheet.xlsb
- > SE-054+055 BurwoodWorksheet.xlsb
- > SE-054+055 CessnockWorksheet.xlsb
- > SE-054+055 ClarenceTownWorksheet.xlsb
- > SE-054+055 DoraCreekWorksheet.xlsb
- > SE-054+055 DungogWorksheet 23.12.2020 (old).xlsb
- > SE-054+055 DungogWorksheet.xlsb
- > SE-054+055 EdgeworthWorksheet.xlsb
- > SE-054+055 FarleyWorksheet.xlsb
- > SE-054+055 KaruahWorksheet.xlsb
- > SE-054+055 KearsleyWorksheet.xlsb
- > SE-054+055 KurriKurriWorksheet.xlsb
- > SE-054+055 MorpethWorksheet.xlsb
- > SE-054+055 PaxtonWorksheet.xlsb
- > SE-054+055 RaymondTerraceWorksheet.xlsb
- > SE-054+055 ShortlandWorksheet.xlsb
- > SE-054+055 TanilbaBayWorksheet.xlsb
- > SE-054+055 TorontoWorksheet.xlsb
- > SE-007a HW IPART Information Nov 21.xlsx
- > SE-007b - Explanatory Information.docx
- > SE-033 ALS contract Excerpt re QA QC.PDF
- > SE-034 Reservoir Check.pdf
- > SE-041c 20201120 SME Coalition Sprint Brief - CI2 Innovation Spectrum Concept (v4).pdf
- > Email from Hunter Water to Audit Team on 23 December 2021 regarding Dungog helminth reduction

Clause 3.3 – System performance standards

- > 3.3.1-E-001 - AOMS 637816 Low Water Pressure Modelled Customers.docx
- > 3.3.1-E-002 - AOMS problem and solution codes (1).pdf
- > 3.3.1-E-003 - AOMS problem and solution codes (2).pdf
- > 3.3.1-E-004 - File note - Annual Water Pressure Failure Assessment Procedures.docx
- > 3.3.1-E-005 - Hunter Water - Compliance and Performance Report 2020-21.pdf
- > 3.3.1-E-006 - Low Pressure Example AOMS Job.docx
- > 3.3.1-E-007 - Low pressure 8.6.21.xlsx
- > 3.3.2-E-001 - Discontinuity Assessment and Reporting Procedure.DOCX
- > 3.3.2-E-002 - S2 - Unplanned water interruptions 5 continuous hours - Final for 2017-2.docx
- > 3.3.2-E-003 - S3 – Three or more unplanned water interruptions greater 1 hour - FINAL 2.docx
- > 3.3.2-E-005 - Data - AOMS 629787 - 17 Fred Avery Drive Buttaba - AOMS Data.DOCX
- > 3.3.2-E-006 - Map - AOMS 629787 - 17 Fred Avery Drive Buttaba - Map.JPG

- > 3.3.2-E-007 - Form - AOMS 629787 - 17 Fred Avery Drive Buttaba - Cover Shee.DOCX
- > 3.3.2-E-008 - AOMS 641642 Example Water Discontinuity Event.docx
- > 3.3.2-E-009 - Hunter Water - Compliance and Performance Report 2020-21.pdf
- > 3.3.2-E-010 - Data - DiscontinuityRegister.XLSX
- > 3.3.2-E-011 - Schedule - Unplanned Interruptions over 5 hours.xlsx
- > 3.3.3-E-001 - S4 – Uncontrolled Dryweather wastewater overflow - Final 2017-20.DOCX
- > 3.3.3-E-002 - S5 – 3 or more uncontrolled wastewater overflows - Final 2017-20.docx
- > 3.3.3-E-003 - Example Wastewater Overflow Job.pdf
- > 3.3.3-E-004 - AOMS problem and solution codes (1).pdf
- > 3.3.3-E-005 - AOMS problem and solution codes (2).pdf
- > SE-022 Bulk load for AOMS - known Low Water pressure excel 2020 to 2021.xlsx
- > SE-22 Low pressure customer list FY21.xlsx
- > SE-023 Guideline - Low Water Pressure.DOC
- > SE-023 Response Including Diagnostics - May 2019.DOCX
- > SE-024a Data - AOMS 636772 - 96 Black Rock Road Martins Creek - AOMS Data.DOCX
- > SE-024b Form - AOMS 636772 - 96 Black Rock Road Martins Creek - Cover Sheet.DOCX
- > SE-024c Map - AOMS 636772 - 96 Black Rock Road Martins Creek - Map.JPG
- > SE-046 3 or more dry weather events - 11 Derna Rd Shortland.docx

Clause 4.1 – Asset management system

- > 4.1.2-E-001 - Policy - Asset Management 2021.pdf
- > 4.1.2-E-002 - Strategic Asset Management Plan (SAMP).pdf
- > 4.1.2-E-003 - 2021 HUNTER_WATER_BVC_AUDIT_REPORT_SV1_May21.pdf
- > 4.1.2-E-004 - Certificate - AU004029-1 HWC - AMS ISO 55001 - Jul 2020.pdf
- > 4.1.2-E-005 - Compliance-and-Performance-Report-2020-21.pdf
- > 4.1.2-E-006 - Asset Management Performance Report 2020.DOCX
- > 4.1.2-E-007 - Risk Driver Analysis Summary - Critical Assets - 2020.DOCX
- > 4.1.2-E-008 - AOMS Dashboard – Example.docx
- > 4.1.2-E-009 - HWC Operating Licence Performance Dashboard.docx
- > 4.1.2-E-010 HW2012-1042 31.124 Report - Burwood Beach WWTW (ST-BUR) Treatment Plant.docx
- > 4.1.2-E-010a audit schedules.msg
- > 4.1.2-E-010b Burwood Audit - job card.pdf
- > 4.1.2-E-010c Data - Action tracker Burwood WWTW Site Audit.XLSX
- > 4.1.2-E-010d Ellipse - burwood audit.png
- > 4.1.2-E-011 - Asset Management System Steering Committee - Terms of Reference.DOCX
- > 4.1.2-E-012 - AMS Steering Committee Minutes June 2021.DOCX
- > 4.1.2-E-013 - AMS Steering Committee Minutes 14 September 2021.DOCX
- > 4.1.2-E-014 - AMS Steering Committee - 14 September 2021 Action Plan.docx
- > 4.1.2-E-015 - Template - NPR Data 2020-21.XLSX
- > 4.1.2-E-016 - Board Paper - Item 3.3 - Strategic Asset Management - 24 Jun 2021.pdf
- > 4.1.2-E-017 - Report - Veolia MCR CS0341 - August 2021.PDF

- > 4.1.2-E-018 - Asset Management Training - Summary for 2021 IPART OL Audit.xlsx
- > 4.1.2-E-019 - WSAA AMCV benchmarking report – December 2020.pdf
- > 4.1.2-E-020 - Standard - CURRENT - Enterprise Risk Management Standard.DOCX
- > 4.1.2-E-021 - Risk Appetite Statements - Version 3.DOCX
- > 4.1.2-E-022 - Risk Driver Analysis Summary - Critical Assets - 2020.DOCX
- > 4.1.2-E-023 - Standard - Critical Assets.DOCX
- > 4.1.2-E-025 - Towards 2024 Business Plan.pdf
- > 4.1.2-E-026 - Strategic Case – Safe and Reliable Water Services.DOCX
- > 4.1.2-E-027 - Hunter Water Growth Plan 2021.pdf
- > 4.1.2-E-028 - Asset Class Plan (facility plan) Lemon Tree Passage WTP.DOCX
- > 4.1.2-E-029 - ASSET MANAGEMENT PLAN (OPERATIONS AND MAINTENANCE) - Chichester Dam.DOCX
- > 4.1.2-E-030 - ACF overview.JPG.JPG
- > 4.1.2-E-031 - ACF - initiation (1).JPG.JPG
- > 4.1.2-E-032 - ACF - initiation (2).JPG.JPG
- > 4.1.2-E-033 - ACF – development (1).JPG.JPG
- > 4.1.2-E-034 - ACF - development (2).JPG.JPG
- > 4.1.2-E-035 - ACF - delivery.JPG.JPG
- > 4.1.2-E-036 - ACF - completion.JPG.JPG
- > 4.1.2-E-037 - ACF Gateway Process Overview.PDF
- > 4.1.2-E-038 - Business Case - G2.1 - Network Mechanical-Electrical Renewals Provision 2020-24.DOCX
- > 4.1.2-E-039 - PDP – Carrington 3 WWPS – Pump renewals.DOCX
- > 4.1.2-E-040 - Plan - PDP- Wastewater Pump Station Refurbishment Package 1.DOCX
- > 4.1.2-E-041 - PDP VP2137 Dungog WTP Chlorine Drum Hoist Replacement.DOCX
- > 4.1.2-E-042 - PDP VP2185 Kurri Kurri WWTW Air Compressor #2 Replacement.DOCX
- > 4.1.2-E-043 - Business Case - Morpeth WWTW Diffuser Replacement.DOCX
- > 4.1.2-E-044 - File note - Hunter Water SR 35 WWTP & WTP CA Stage 2_210930.PDF
- > 4.1.2-E-045 - SR00175 Network Asset Condition Assessment Scoping Phase Draft.docx
- > 4.1.2-E-046 - PDP – Critical mains wastewater CCTV CA 2021 package 2.DOCX
- > 4.1.2-E-047 - Data - HUNTER WATER PUMP STATION INSEPCIONS.XLSX
- > 4.1.2-E-048 - Service Request - Wastewater Network Structures Ad-hoc Condition Assessment.DOCX
- > 4.1.2-E-050 - Inventory Dashboard – Screenshots.docx
- > 4.1.2-E-051 - Standard - Asset Class Management HW2016-40678 008.DOCX
- > 4.1.2-E-054 - Business Performance Report - April 2021.PDF
- > SE-048 From Asset Class Plan Register S09-3 4 5 11.004.xlsx
- > SE-049 SR00162 AM CompetencyPEP 200921.pdf
- > SE-050a EMT Monthly Report - Objective Status-2021-10-05-075143 (1).pdf
- > SE-050b EMT Quarterly RAYG - Objs and KPIs-2021-09-29-135645.pdf
- > SE-050c MAINTAIN THE SAFETY OF DRINKING WATER.pdf
- > SE-052.docx
- > SE-052b EMM KPI Monthly Summary.docx

- > SE-053 Presentation - AMS Operating Licence Audit - Thursday 4th Nov 2021.pptx
- > SE-076a FW_ AOMS 652007 - Abermain reservoir repair - Audit Action.msg
- > SE-076b FW_ Abermain Reservoir - Repair.msg

Clause 4.2 – Environmental management system

- > 4.2.1-E-001 - Plan - EP0013 Structure and Responsibility.DOCX
- > 4.2.1-E-002 - Certificate - AU004025-1 HWC - EMS ISO14001 - Jul 2020.PDF
- > 4.2.1-E-003 - 2021 HUNTER WATER BVC AUDIT REPORT SV1 May21 INTEGRATED 55kQHSE R1 (1).pdf
- > 4.2.1-E-004 - Register - 2LOD IMS Audit Programme - CURRENT.XLSX
- > 4.2.1-E-005 - Policy - EP0004 - Community and Environment Policy - CURRENT - SIGNED.PDF
- > 4.2.1-E-006 - Procedure - Manage Document Control.DOCX
- > 4.2.1-E-007 - Report - Deloitte Environmental Compliance Audit_Final Report - March 2021.PDF
- > 4.2.1-E-008 - EP0055 - Depot and Work Site Environmental Inspection Procedure - CURRENT.DOCX
- > 4.2.1-E-009 - ER0054 - Depot and work site environmental inspection schedule - CURRENT.XLS
- > 4.2.1-E-010 - Grahamstown WTP and Schroder - Environmental Inspection September 2021.PDF
- > 4.2.1-E-011 - Report - IMS Audit Report (Planning & Ops Management) 2019-11 Final.DOCX
- > 4.2.1-E-012 - QEM Final Audit Report (Dam & Catchment) System Audit 2019-03-29.DOC
- > 4.2.1-E-013 - Report - Audit Report (Contractor Mgmt Systems) 2019-03-27 FINAL.DOC
- > 4.2.1-E-014 - Controlled Document - Integrated Management System Manual.DOCX
- > 4.2.1-E-015 - Report - Raymond Terrace WWTW - Environmental Inspection September 2021.PDF
- > 4.2.1-E-016 - Report - Work Site Environmental Inspection_ Hunter St Toronto_08 Sept 2021.PDF
- > 4.2.1-E-017 - Report - Work Site Environmental Inspection_ Sara St Toronto_22 Sept 2021.PDF
- > 4.2.2-E-001 - HW2008-772 13 1.001 Training Material - EIA and Heritage_online.pptx
- > 4.2.2-E-002 - IMS Training Matrix.XLSM
- > 4.2.2-E-003 - Master plans - Strategic Cases.jpg
- > 4.2.2-E-004 - Presentation - Environmental induction presentation - CURRENT.PPTX
- > 4.2.2-E-005 - Procedure - EP0010 - Environmental Aspects and Risk Assessment - CURRENT.DOCX
- > 4.2.2-E-006 - Report - Draft Hunter Water Environmental Management Plan 2021-2024 - June 2021.PDF
- > 4.2.2-E-007 - Report - Risk Driver Analysis Summary – Non-compliance with environmental legislation - Se.DOCX
- > 4.2.2-E-008 - Safe and Reliable Services Strategic Case.DOCX
- > 4.2.2-E-009 - Water Resilience Strategic Case.docx
- > 4.2.2-E-010 - Management Systems Performance Review - 1 JULY 2020 - 31 MARCH 2021 - March 20.docx
- > 4.2.2-E-011 - HW2019-895 2 2.046 Report - Environment EMT Monthly Report - July 2021.docx
- > 4.2.2-E-012 - HW2017-1114 1.006 Working Paper - Governance & Assurance(4).xlsx
- > SE-044 Report - Risk Driver Analysis Summary – Non-compliance with environmental legislation - Sept 2021.DOCX
- > SE-045 EF0102 Capital Works Environmental Inspection Checklist.xlsx
- > SE-069 Minutes - Audit & Risk Committee meeting [approved & signed] - 18 Mar 20....pdf

Clause 4.3 – Quality management system

- > Interview with Integrated Systems Manager and Manager Water Treatment Operations (LTP), 2 November 2021
- > SE-063 LHAG-79FDEA - NCR Systemic Document Control Failure.pdf
- > 4.3.1-E-002 - HW2013-1447 18 4.006 Certificate - AU004026-1 HWC - QMS ISO 9001 - Jul.pdf
- > 4.3.1-E-002 - HW2013-1447 18 4.006 Certificate AU004026-1 HWC-QMS ISO 9001-Jul 2020.DOCX
- > 4.3.1-E-003 - 2021 BVC AUDIT REPORT SV1 May21 INTEGRATED 55kQHSE_R1 (1).pdf
- > 4.3.2-E-001 - HW2013-421 9.001 Register - 2LOD IMS Audit Programme - CURRENT.XLSX
- > 4.3.2-E-002 - IMS-2021-A-01 IMS Audit Report 2021-02 Maintenance Contracts.DOCX
- > 4.3.2-E-003 - Report - IMS-2021-P-04 Audit - Lemon Tree Passage-Gresford.PDF
- > 4.3.2-E-004 - HW2013-1447 1 33.003 Report - IMS-2021-P-05 Dungog RW Audit.XLSX
- > 4.3.2-E-005 - MRM-2021-04-26 - IMS Management Review MOM&Record 2021 (1).pdf
- > 4.3.2-E-006 - Hunter Water Draft 3LOD Internal Audit Plan 2021-24.pptx
- > Evidence sighted as part of auditing at least Elements 10, 11 and 12 of the drinking water clause and documentation checked for currency, as part of auditing Clause 3.1.1 and 3.1.2
- > SE-009a TRIM record of review-approval DWQ Policy.png
- > SE-009b Integrum Screenshot DWQ Policy Issue of approved document.png
- > SE-009c Approved Quality Policy.msg
- > SE-009d Policy - Quality Approved signed document.pdf
- > SE-009e Review Submission for Quality Policy.msg
- > SE-010a NATA Chemical Letter.pdf
- > SE-010b NATA Micro letter.pdf

Clause 5.7 – Provision of information to customers and the general public

- > 5.7.1-E-001 - Customer Contract Summary - March - June 2021 Billing Cycle.pdf
- > 5.7.1-E-002 - Payment Difficulties and actions for non payment - Making Waves - November-February 2021.pdf
- > 5.7.1-E-003 - Customer Rebates - July-October Billing Cycle 2020.pdf
- > 5.7.1-E-004 - General enquiries process - March - June 2021 Billing Cycle(2).pdf
- > 5.7.1-E-005 - Complaints Handling and EWON brochure - November 2020 - February 2021 Billing Cycle.pdf
- > SE-017-5.7.1-Your water account.eml
- > SE-018 (5.7.1) Standard - Service Related Rebates.docx
- > SE-019 (5.7.1) - HW2008-235 29 8.004 Guideline - HW2008-235 6.019 Guideline - Water Quality - Dirty Water(2).DOC
- > SE-020 (5.7.1) Sewer Shaft Graphic.jpg
- > SE-021 (5.7.1) HW2008-235 29 8.006 Guideline - HW2008-235 6.022 Guideline - Low Water Pressure(2).DOC

Clause 6.2 – Reporting manual

- > 6.2.1-E-001 - NSW Health's review of the draft Dungog RWQMP.msg
- > 6.2.1-E-002 - HW2006-1448 41 12.004.DOCX
- > 6.2.1-E-003 - HW2006-1448 41 12.006.DOCX
- > 6.2.1-E-004 - HW2006-1448 41 12.009.DOCX

- > 6.2.1-E-005 - Dungog CCP breach report .pdf
- > 6.2.1-E-006 - Clarence Town CCP breach report .pdf
- > 6.2.1-E-007 - HW2012-778 92 26.001 Schedule - Compliance Calendar - Sept 2021.XLSX
- > 6.2.1-E-008 - HW2012-778.062 Controlled Document - Procedure - Compliance Calendar - CURRENT.PDF
- > 6.2.1-E-009 - HW2013-421 11.007 Procedure - Nonconformity, Corrective and Preventive Action – CURREN.DOCX
- > 6.2.1-E-010 - HW2020-199 2.001 Procedure - Internal Audit Actions.PDF
- > 6.2.1-E-012 - IMS Management Review MOM&Record 2021.PDF
- > 6.2.1-E-013 - HW2013-421 2.003 Integrated Management System Manual.DOCX
- > 6.2.1-E-014 - HW2013-421 11.003 Procedure - 2LOD Integrated Management System Audits.DOCX
- > 6.2.1-E-015 - HW2013-421 25.001 Internal Audit Charter.PDF
- > 6.2.1-E-016 - HW2013-421 2.004 Manual – Internal Audit.DOCX
- > 6.2.1-E-017 - HW2013-421 9.001 Register - 2LOD IMS Audit Programme – CURRENT.XLSX
- > 6.2.1-E-018 - HW2020-9143.005 Hunter Water 3LOD Internal Audit Plan 2021-24.pptx
- > 6.2.1-E-019 - HW2018-349.003 - IPART Reporting and Monitoring Protocol - CURRENT.DOCX
- > SE-025 Schedule - Compliance Calendar - 20212022.XLSX
- > SE-025b Schedule - Compliance Calendar - 20202021.XLSX
- > SE-026 Watershed - Excerpt from Project Board meeting re Schedule.pdf
- > SE-027 Please complete Compliance and Performance Report chapters by 30 July 2021.msg
- > SE-057 Procedure - Monthly Water Quality Summary Reporting Procedure.DOC
- > SE-070a Guideline - Criteria for Notification to NSW Health - re Drinking Water.xls
- > SE-070b Screenshot Trim Reportables Location.pdf

F IPART's checks for the 2021 operational audit

Table F.1 Clauses that we checked as part of the 2021 operational audit

Operating licence clause		Compliance grade
1.7.1	Hunter Water must make a copy of this Licence available to any person, free of charge: a) on its website for downloading; and b) upon request made through the General Enquiry Process.	
5.1.2	Before publishing a notice under section 38 of the Act for the purpose of varying the terms and conditions of the Customer Contract, Hunter Water must provide IPART with a copy of the notice.	
5.6.1	Hunter Water must be a member of the Energy and Water Ombudsman NSW to facilitate the resolution, by a dispute resolution body, of disputes between Hunter Water and its Customers or Consumers.	
5.7.2	Hunter Water must make a copy of the following documents available to any person, free of charge on its website for downloading and upon request through the General Enquiry Process: a) the Customer Contract; b) a pamphlet or pamphlets (as referred to in clause 5.7.1); c) the Procedure for Payment Difficulties and Actions for Non-payment; d) the Customer Advisory Group Charter; e) customer advisory group minutes; f) the Internal Complaints Handling Procedure; g) information about the dispute resolution scheme provided by Energy and Water Ombudsman NSW; and h) a map of the Area of Operations.	
6.1.2	Hunter Water must provide to IPART or the Auditor all information in Hunter Water's possession, or under Hunter Water's custody or control, which is necessary or convenient for the conduct of the Operational Audit.	
6.1.3	Without limiting clause 6.1.2, Hunter Water must provide to IPART or the Auditor any information necessary or convenient for the conduct of the Operational Audit which IPART or the Auditor requests in writing, within any reasonable period of time specified by IPART or the Auditor in writing.	
6.1.4	For the purposes of any Operational Audit or verifying a report on an Operational Audit, Hunter Water must, within a reasonable period of time from receiving a request from IPART or an Auditor, permit IPART or the Auditor to: a) access any works, premises or offices occupied by Hunter Water; b) carry out inspections, measurements and tests on, or in relation to, any such works, premises or offices; c) take on to any such premises or offices, any person or equipment necessary for the purposes of performing the Operational Audit or verifying any report on the Operational Audit; d) inspect and make copies of, and take extracts from, any books and records of Hunter Water that are maintained in relation to the performance of Hunter Water's obligations under this Licence (including obligations under the Reporting Manual); and e) discuss matters relevant to the Operational Audit or any report on the Operational Audit with Hunter Water, including Hunter Water's officers and employees.	
6.3.1	Hunter Water must provide IPART or an Auditor with information relating to the performance of any of Hunter Water's obligations under clause 6.2 (including providing IPART with physical and electronic access to the records required to be kept under clause 6.2) within a reasonable period of time from Hunter Water receiving a request from IPART or an Auditor for that information	
6.3.2	Hunter Water must provide IPART or an Auditor with such information as is reasonably required to enable IPART or an Auditor to conduct any review or investigation of Hunter Water's obligations under this Licence within a reasonable period of time from Hunter Water receiving a request from IPART or an Auditor for that information.	
6.3.3	If Hunter Water contracts out any of its activities to any person (including a subsidiary) it must take all reasonable steps to ensure that, if required by IPART or an Auditor, any such persons provide information and do the things specified in this clause 6 as if that person were Hunter Water.	
6.3.4	Where this Licence requires Hunter Water to provide information to IPART or an Auditor that is information to which: a) Section 24FF of the IPART Act applies; or	

Operating licence clause	Compliance grade
b) Section 24FF of the IPART Act does not apply but IPART or the Auditor has agreed to treat the information as though section 24FF of the IPART Act applies to that information Hunter Water must, to the maximum extent permitted by the law, provide that information even if it is confidential.	

Note:  = Compliant,  = Not Required.

¹ IPART, *Hunter Water Reporting Manual Operating Licence 2019-2023*, November 2019.

² The Hon. Kevin Anderson MP.

³ IPART, *Hunter Water Reporting Manual Operating Licence 2019-2023*, November 2019.

⁴ IPART, *Hunter Water Operational Audit 2019 – Report to the Minister – Compliance Report*, March 2020.

IPART, *Hunter Water Operational Audit 2020 – Report to the Minister – Compliance Report*, March 2021

IPART, *Hunter Water Corporation Operational Audit 2013/14, Report to the Minister, Water – Compliance Report*, December 2014.

⁵ IPART, *Compliance and Enforcement Policy*, December 2017.

⁶ IPART, *Audit Guideline – Public Water Utilities*, July 2019.

⁷ The audit interviews were held online and site visits were conducted in person.

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