IPART Independent Pricing and Regulatory Tribunal | NSW

Sydney Water compliance report 2023-24

Report to the Minister

February 2025

Water »

Acknowledgment of Country

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

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

Tribunal Members

The Tribunal members for this review are:

Carmel Donnelly PSM, Chair
Dr Darryl Biggar
Jonathan Coppel
Sharon Henrick

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

Christine Allen	(02) 9290 8412
Shweta Shrestha	(02) 9113 7735

The audit team also includes:

Nahrain Oshana	(02) 9019 1962

The Independent Pricing and Regulatory Tribunal

IPART's independence is underpinned by an Act of Parliament. Further information on IPART can be obtained from IPART's website.

Contents

Summary

This is our report to the Minister for Water (Minister) on Sydney Water's compliance with the Sydney Water operating licence 2019-2024 (licence)[a] over the 2023-24 compliance period (i.e. from 1 July 2023 to 30 June 2024).

IPART is responsible for monitoring Sydney Water's compliance with its licence and reporting our findings to the Minister.[1] We primarily do this through annual audits of Sydney Water's compliance with its licence.[b] We engaged Cobbitty Consulting Pty Ltd (Cobbitty Consulting) in partnership with Viridis Consultants Pty Ltd to complete the 2024 audit.

Sydney Water demonstrated a high level of compliance with its licence over the compliance period. Of note, Sydney Water demonstrated substantial improvements to its asset management approach. In the past, we have taken enforcement action in response to Sydney Water's failure to properly implement its asset management system (AMS). This year, we found Sydney Water was compliant with its obligation to implement an AMS. Sydney Water has undertaken extensive work to improve its AMS under its Service Excellence Framework. We observed improvements, such as better integration across relevant parts of the business, in Sydney Water's approach to managing asset lifecycle as required under its AMS.

Our recommendations

The 2024 audit tested Sydney Water's compliance with 13 licence clauses. We assessed Sydney Water as compliant with 9 of the 13 clauses. One audited clause was assigned a "no requirement" grade as the obligation was not triggered during the compliance period.

We assigned Sydney Water as non-compliant (non-material) against one clause which requires compliance with the Fluoridation Code and compliant (minor shortcomings) for 2 clauses related to Sydney Water's implementation of its Drinking Water Quality Management System (DWQMS) and Recycled Water Quality Management System (RWQMS). We make the following recommendations for Sydney Water to rectify the non-compliances and shortcomings:

- **2024-1-4.1**: By 30 June 2025, review the implementation of the backflow prevention program required under the *Drinking Water Product Specification*. The review should include target criteria and enforceable actions that Sydney Water can undertake to improve compliance against the annual testing target specified in its *Drinking Water Product Specification* (relates to element 3 of the DWQMS).

[a] The term of the licence was extended to 30 June 2024, making it the licence in effect during the compliance period.

[b] Our reports to the Minister on Sydney Water's compliance with its licence over the 2019-2024 licence term are published on our website.

- **2024-2-4.1**: By 30 June 2025, review the location and implementation of the primary disinfection critical control monitoring point at Cascade Water Filtration Plant (WFP) to ensure it aligns with the *Drinking Water Product Specification* (which states that free chlorine should be monitored at the reservoir outlet before the first customer). Update the Cascade WFP process flow diagram and Process Specification documentation based on the review findings (relates to element 3 of the DWQMS).
- **2024-3-4.1**: By 30 June 2025, ensure that the document control information is updated in the version history table of documents and procedures when they are reviewed or updated, in line with the requirements of the *Controlled Documents Procedure* and *Controlled Documents Standard* (relates to element 10 of the DWQMS).
- **2024-4-4.3**: By 30 June 2025, ensure that fluoride dosing pumps cannot be left on manual mode for longer than 5 minutes. Check all fluoride dosing plants to ensure that the arbiter manual function is disabled, other manual modes in SCADA/PLC time out after 5 minutes and that any other manual modes at the device level require continuous operator intervention to operate.[c]
- **2024-5-4.3**: By 30 June 2025, evaluate if the fans installed in fluoride rooms are acid resistant, and appropriately protect equipment from fumes and provide a safe working environment.
- **2024-6-4.3**: By 30 June 2025, check the capacity of fluoride day tanks at all WFPs using the actual volume between the outlet and overflow inverts. The day tank capacity should not exceed 36 hours of fluoride dosing at maximum plant flow. The capacity calculations should be based on target operational dose and not the prescribed dose.

We also identified 30 opportunities for improvement (OFI) throughout the audit. The purpose of identifying these OFIs is to highlight improvement opportunities in Sydney Water's systems and business processes where current operations may not align with industry or international best practice. However, we note that there is no requirement for Sydney Water to implement them.

Ongoing recommendations from previous years

We checked Sydney Water's progress in addressing 13 recommendations from previous audits and determined that Sydney Water completed 12 of the recommendations. One recommendation, related to Sydney Water's management of cross-connections, is ongoing.

The 2023 audit identified that cross-connection controls between the drinking water and recycled water pipes in dual reticulations networks may be inadequate. We identified that Sydney Water should take steps to reduce the risk of cross-connections at relevant premises. Sydney Water has made progress against closing out the recommendation with respect to mitigating the risk of cross-connections at new developments during this compliance period. We note that Sydney Water is working with NSW Health and the Building Commission NSW to reduce the risk of cross-connections at existing dual reticulation properties.

[c] SCADA means Supervisory Control and Data Acquisition. PLC means Programmable Logic Controller.

1 Our recommendations and audit findings

1.1 Sydney Water's compliance in 2023-24

In 2024, we audited Sydney Water's compliance against 13 clauses of its 2019-2023 operating licence (licence).[d] Appendix D sets out the full audit scope.

Sydney Water was compliant with 9 clauses which impose requirements related to:[e]

- performance standards Sydney Water must meet in relation to service interruptions
- requirements to implement an AMS
- information and services Sydney Water must provide to competitors who provide or seek to provide water services to customers in Sydney Water's area of operation
- Sydney Water's monitoring of its performance and meeting mandatory reporting requirements
- Sydney Water's role in supporting IPART's end of term operating licence review, finalised in 2024.

One clause was assigned a "no requirement" grade as the obligation was not triggered during the compliance period. For the remaining clauses, we assigned Sydney Water non-compliant or compliant (minor shortcomings) grades.

We summarise the non-compliances and minor shortcomings, and our recommendations for Sydney Water to rectify them, in **Table 1.1**. The recommendations seek to resolve non-compliances and shortcomings with Sydney Water's implementation of its drinking water quality management system and fluoridation processes.

The auditor identified 30 opportunities for improvement for Sydney Water's consideration. We request that auditors suggest OFIs where current operations may not align with industry or international best practice. The purpose of identifying OFIs is to highlight improvement opportunities identified at the audit. However we note that there is no requirement for Sydney Water to implement them. The OFIs identified at this audit related to audit observations around performance standards for water quality and performance standards for service interruptions. The opportunities for improvement are detailed in Table E.4 of the auditor's report in Appendix E.

[d] The term of the licence was extended to 30 June 2024, making it the licence in effect during the compliance period.

[e] We assign 4 compliance grades reflecting a utility's compliance with its licence requirements including compliant, compliant (minor shortcomings), non-compliant (non-material) and non-compliant (material). These grades are explained in our Public Water Utility Audit Guideline.

1.2 Sydney Water's approach to asset management has improved

We consider that Sydney Water has demonstrated substantial improvements to its asset management approach during the compliance period. We have previously taken enforcement action in response to Sydney Water's implementation of its asset management system. However, this year, we found Sydney Water had implemented its AMS. We note the work that Sydney Water has completed to improve its AMS under its Asset Service Excellence Roadmap and the associated actions, which is due to be delivered by July 2025. We observed significant improvements to Sydney Water's approach to managing assets lifecycle, such as better integration across relevant parts of the business.

Table 1.1 Non-compliances and minor shortcomings identified in the 2023-24 compliance period

Licence clause	Identified non-compliance or minor shortcoming	Audit grade	Recommendation #
Clause 4.1.3 Performance standards for water quality – drinking water (implementation)	We have assigned Sydney Water a **compliant (minor shortcomings)** grade for clause 4.1.3. This agrees with the auditor's findings. Sydney Water has largely implemented its drinking water quality management system. We identified minor shortcomings against elements 3 and 10 of the Australian Drinking Water Guidelines. These shortcomings did not impact Sydney Water's ability to supply safe and reliable drinking water, nor did it result in adverse public health outcomes, during the compliance period. Shortcomings identified for this clause include: • Sydney Water did not undertake backflow testing in line with the *Drinking Water Product Specification*. The specification sets an annual target of 90% backflow prevention device testing. Sydney Water had completed approximately 70% of backflow testing across its area of operations. This is considered a minor shortcoming as Sydney Water implements a multi-barrier approach to prevent contamination in the drinking water network. Sydney Water did not complete backflow testing in line with the Drinking Water Product Specification which weakens one barrier protecting public health. However, this did not impact Sydney Water's ability to supply safe and reliable water to its customers during the compliance period. • The documentation for monitoring the primary disinfection critical control point (CCP) at Cascade water filtration plant did not align with the *Drinking Water Product Specification*. We consider this is a minor shortcoming as the correct parameter (free chlorine) is being monitored at the appropriate location. • Some of Sydney Water's documented procedures did not include updated version history tables within those documents as required under Sydney Water's Controlled Document Standard. We consider that this is an administrative error which does not represent a risk to public health.	 Compliant (minor shortcomings)	2024-1-4.1 2024-2-4.1 2024-3-4.1
Clause 4.2.3 Performance standards for water quality – recycled water (implementation)	We have assigned Sydney Water a **compliant (minor shortcomings)** grade for clause 4.2.3. This agrees with the auditor's findings. Sydney Water has largely implemented its recycled water quality management system. We identified one minor shortcoming against element 4 of the Australian Guidelines for Water Recycling. This shortcoming did not impact Sydney Water's ability to provide safe and reliable recycled water, nor did it result in adverse public health and environmental outcomes, during the compliance period. The shortcoming identified related to Sydney Water's failure to calibrate a chlorine analyser at the Quakers Hill water resource recovery facility in accordance with its documented calibration schedule. We note that Sydney Water developed and implemented a revised instrument calibration monitoring procedure by the end of the 2024 compliance period. This was in response to a similar issue, identified for a different site, at the 2023 audit. We consider that this is a minor shortcoming as it did not impact Sydney Water's ability to supply safe and reliable recycled water services to its customers during the compliance period.	 Compliant (minor shortcomings)	We make no recommendations regarding the shortcoming as Sydney Water addressed the issues, by the end of the audit period, in response to previous recommendation 2023-08

Licence clause	Identified non-compliance or minor shortcoming	Audit grade	Recommendation #
Clause 4.3.1 Fluoridation Code	We have assigned Sydney Water a **non-compliant (non-material)** grade for clause 4.3.1. This agrees with the auditor's findings. We identified the following shortcomings which resulted in a non-compliant (non-material) grade: • Sydney Water did not fully comply with the design requirements for fluoride dosing systems specified in the Plumbing Code at the Cascade water filtration plant as: – Fluoride dosing pumps at Cascade water filtration plant could remain in manual mode indefinitely. The Fluoridation Code specifies that manual operation should time out after 5 minutes to avoid the risk of overdosing due to human error. – The fluoride storage tank capacity exceeded 36 hours specified in the Fluoridation Code. – Ventilation in the fluoride room appeared to be inadequate. This is considered a minor shortcoming as Sydney Water implements a multi-barrier approach to minimise the risk of contamination in the drinking water network. These shortcomings did not impact Sydney Water's ability to provide adequately fluoridated water to its customers and consumers during the compliance period. However, the risk of supplying unsafe drinking water may increase if the compliance issues are not resolved in a timely manner.	 Non-compliant (non-material)	2024-4-4.3 2024-5-4.3 2024-6-4.3

1.3 Progress against completing previous recommendations

We reviewed Sydney Water's progress against completing 13 previous recommendations to rectify non-compliances or minor shortcomings identified at previous audits.

Sydney Water has completed 12 of the 13 recommendations. We have summarised the ongoing recommendation in **Table 1.2** below.[6] Sydney Water will continue to be compliant with minor shortcomings against this clause until the recommendation is completed. We will audit the outstanding recommendation at the next audit, along with any new recommendations made in response to non-compliances or shortcomings identified at this year's audit.

Table 1.2 Ongoing recommendations to rectify non-compliances or minor shortcomings identified in previous audits

Ongoing recommendation	Reason why recommendation is not complete	Identified non-compliance or minor shortcoming	Licence clause	Audit grade
2023-03: By 31 December 2024: a) Sydney Water must amend its existing process for connecting properties to the recycled water network to ensure that avoidable cross connections are eliminated. b) Sydney Water should also quantify the public health risk of existing properties and put appropriate controls in place, which may include the auditing of existing connections. This review must be undertaken in collaboration with NSW Health and the Department of Fair Trading. (Relates to Element 3).	Part a) of the recommendation has been addressed. Part b): Sydney Water has audited high-risk recycled water properties for potential cross-connections. Sydney Water has prepared a draft report for consideration by the Building Commission NSW and NSW Health. We anticipate that Sydney Water will complete part b) by June 2025.	Under element 3 of the AGWR, Sydney Water must implement preventative measures to manage recycled water to reduce hazards to acceptable levels. At the 2023 audit, we identified that Sydney Water's processes for identifying and minimising cross-connections between the drinking and recycled water systems in dual reticulation networks was inadequate.	Clause 4.2.1 Maintain water quality management system consistent with AGWR	NC (NM)

1.4 Inputs to the audits and our compliance monitoring

The auditor's report, which details all the auditor's findings, is in Appendix E. We also audited some parts of the licence ourselves – our findings are explained in Appendix F.

We also consider the following in our assessment of Sydney Water's compliance:

- An annual statement of compliance where Sydney Water self-identifies any non-compliances during the compliance period (Appendix B). Sydney Water must provide this to us under part 8.1 of the Sydney Water 2019-2024 reporting manual.

[6] Some of these recommendations were completed after the end of the audit period, but prior to the auditor's final report (as discussed in section 3 of the auditor's report in Appendix E). We consider those recommendations are closed.

- Any relevant reports that Sydney Water submits to us on its compliance with its licence, required under the reporting manual.
- Stakeholder feedback, provided to us confidentially, on Sydney Water's compliance with its licence during the compliance period.

2 Sydney Water's compliance over the licence term

The 2024 audit was the final audit of the 2019-2024 operating licence. Sydney Water has demonstrated a high level of compliance with its licence over the term of its licence.

2.1 Comparison of non-compliant findings over the 2019-2024 licence

We provide a year-on-year comparison of Sydney Water's compliance with some clauses in **Table 2.1**. This comparison only includes obligations where we have found Sydney Water non-compliant at least once during the licence term. It does not include gradings for obligations where Sydney Water only demonstrated full compliance over the licence term.

Table 2.1 Comparative record of non-compliant findings for the 2019-2024 licence

		Compliance grade				
Licence clause	**Requirement**	**2020[a]**	**2021[b]**	**2022[c]**	**2023[d]**	**2024**
1.7.1	Licence context – pricing	✗	✓	-	-	-
3.1.1	Sydney Water must maintain a water conservation program consistent with the Current Economic Method.	✗	✓	✓	-	-
3.1.2	Water Conservation and Planning – economic approach for water conservation	✗	✓	✓	-	-
3.1.4	Water Conservation and Planning – update economic level of water conservation using Current Economic Method	-	-	✓	✓	-
3.2.4	Water Conservation and Planning – water planning	✗	✓	✓	-	-
4.1.1	Performance Standards for Water Quality – drinking water – consistent with ADWG	✓	✓	✓	✓	-
4.1.3	Performance Standards for Water Quality – drinking water – implementation	✓	✗	✗	✓	✓
4.2.1	Performance Standards for Water Quality – recycled water – consistent with AGWR	✓	✓	✓	✗	-
4.2.3	Performance Standards for Water Quality – recycled water – implementation	✓	✓	✗	✗	✓
4.3.1	Fluoridation Code – comply	-	✓	-	-	✗

Licence clause	Requirement	Compliance grade				
		2020[a]	2021[b]	2022[c]	2023[d]	2024
5.1.1	Performance Standards for Service Interruptions – water continuity standard	✗	✓	-	-	✓
5.2.5	Performance Standards for Service Interruptions – water pressure standard	✗	-	-	✓	-
5.5.2	Performance Standards for Service Interruptions – implement AMS	✗	✗	✗	✗	✓
7.2.2	Stakeholder cooperation – Memorandum of Understanding – FRNSW – comply	-	-	-	✓	-
9.1.1[e,f,g,h]	Cyber Security Management System – maintain	✗	✓	✓	✓	✓
9.1.2[e,f,g,h]	Cyber Security Management System – implement	✗	✓	✓	✓	✓
10.2.2	Performance Monitoring and Reporting – reporting	✗	✗	-	-	✓
10.2.4	Performance Monitoring and Reporting – record systems	✓	✗	-	-	-

Audit grades: ✓ Compliant; ✓ Compliant (minor shortcomings); ✗ Non-Compliant (non-material); ✗ Non-Compliant (material)

Sources:

a. IPART, *Sydney Water's compliance with its operating licence 2019-2020 – Report to the Minister*, February 2020
b. IPART, *Sydney Water's compliance with its operating licence 2020-2021 – Report to the Minister*, March 2021
c. IPART, *Sydney Water's compliance with its operating licence 2021-2022 – Report to the Minister*, February 2022
d. IPART, *Sydney Water's compliance with its operating licence 2022-2023 – Report to the Minister*, December 2023
e. Certitude Technology Risk Services, *Cyber Security Audit for Sydney Water*, December 2020
f. Certitude Technology Risk Services, *Licence Conditions Audit – Cyber Security Management System for Sydney Water*, August 2021
g. GHD Digital, *Operating Licence Conditions Audit – Critical Infrastructure Security – Sydney Water Corporation*, August 2022.
h. GHD Digital, *Operating Licence Conditions Audit – Critical Infrastructure Security – Sydney Water Corporation*, August 2023.

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.

B Sydney Water's Statement of Compliance

Statement of Compliance 2024

For 2023/24

Submitted by Sydney Water Corporation

To: The Chief Executive Officer
Independent Pricing and Regulatory Tribunal of NSW
PO Box K35
Haymarket Post Shop NSW 1240

Sydney Water Corporation reports as follows:

1. This statement documents compliance during 2023-24 with all obligations to which Sydney Water Corporation is subject by virtue of its Operating Licence.

2. This report has been prepared by Sydney Water Corporation with all due care and skill, including to ensure that all information provided is true and correct, in full knowledge of conditions to which Sydney Water Corporation is subject under the *Sydney Water Act 1994*.

3. Schedule A provides information on all obligations with which Sydney Water Corporation did not comply during 2023-24.

4. Other than the information provided in Schedule A, Sydney Water Corporation has complied with all conditions to which it is subject.

5. This compliance reports have been approved by the Managing Director and the Chairman of the Board of Directors of Sydney Water Corporation.

DATE: 30 August 2024

Signed: .....

Name: Roch Cheroux

Designation: Managing Director

DATE: 30 August 2024

Signed: .....

Name: Grant King

Designation: Chairman

Schedule A - Non Compliances 2023-24

Nil return for 2023-24
i. Date or period of non-compliance Not applicable
ii. Nature and extent of non-compliance (including whether and how many customers have been affected) Not applicable
iii. Results of any monitoring (where applicable) Not applicable
iv. Reasons for non-compliance Not applicable
v. Remedial action taken Not applicable
vi. Actual/anticipated date of achieving compliance Not applicable

C Audit process

We apply our Compliance and Enforcement Policy in developing the annual audit scopes.[2] 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 Sydney Water staff, and undertaking field verification to investigate how effectively the requirements of the licence are met in practice.

C.1 2024 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.[3]

The audit scope for Sydney Water's 2024 audit included obligations on:

- Licence context (Part 1) – requirements on end of term review.
- Performance standards for water quality (Part 4) – requirements on drinking water and recycled water.
- Performance standards for service interruptions (Part 5) – requirements on system performance standards and asset management.
- Information and services for competitors (Part 8) – requirements on negotiating and establishing a code of conduct with potential competitors.
- Performance monitoring and reporting (Part 10) – requirements on operational audits, information provision and reporting.

We did not audit clauses from Part 2 (Licence Authorisation), Part 3 (Water Conservation and Planning), Part 6 (Customers and Consumers) and Part 7 (Stakeholder Cooperation) of the Licence this year.

The audit scope is in Appendix D.

We also consulted with NSW Health, NSW Environment Protection Authority (EPA), Natural Resources Access Regulator (NRAR), Fire and Rescue NSW (FRNSW) and NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) to determine the scope of the audit. We received submissions from NSW Health, EPA, FRNSW and DCCEEW.

- DCCEEW and the Minister for Water suggested that the audit review:
  - Sydney Water's compliance with its obligation to negotiate with *Water Industry Competition Act 2006* (WIC Act) licensees and potential competitors in good faith (clause 8.1).
  - Asset management of sewage infrastructure. In particular, DCCEEW raised concerns about the impact of Sydney Water's sewage infrastructure in national parklands given a significant part of existing sewage infrastructure which runs through or adjacent to national parklands requires upgrade or repair.
- NSW Health suggested that the audit review:
  - installation and operation of emergency pre-treatment at Prospect, Warragamba and Orchard Hills treatment plants and progress on permanent upgrades
  - recycled water cross-connection controls and Sydney Water's progress on reducing the risk of cross-connections at new and existing developments
  - Sydney Water's progress on consistency of controls for critical processes including interlocks for all treatment plant
  - Sydney Water's progress on prioritisation of maintenance and renewal of assets.
- EPA noted that:
  - Sydney Water did not comply with the requirements on dry weather overflow standards in the 2022-23 audit period, which may be an ongoing non-compliance.
  - It imposed a mandatory environmental audit on Sydney Water in response to a series of major sewage overflows.
- FRNSW noted that:
  - Sydney Water has provided pressure and flow performance data for 29% of hydrants within its network, and liaises with FRNSW through a collaborative working group.
  - In its view, Sydney Water has not committed sufficient resources to projects to upgrade infrastructure. FRNSW also noted that it was not aware of any works by Sydney Water to upgrade their network to improve flows for firefighting water.

C.2 2024 audit plan

We engaged Cobbitty Consulting in partnership with Viridis Consultants to undertake the 2024 Sydney Water audit.

We held a project start-up meeting with the auditor on 23 July 2024 to agree on the project milestones, audit timing, and outline our expectations. We participated in the audit inception meeting with Sydney Water and the auditor on the first day of the audit interviews, on 17 September 2024. 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 four 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 Sydney Water in response to the questionnaire
4. Conduct interviews with Sydney Water staff as appropriate
5. Conduct field verification to assess the implementation of Sydney Water's systems and procedures
6. Assess the level of compliance (in line with our compliance grades) Sydney Water achieved for each of the identified Licence obligations, and provide supporting evidence for this assessment
7. Assess and report on progress by Sydney 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 Summary of audit findings and a draft audit report to us and address comments from Sydney 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 2023). 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 (2008) Compliance Engagements, AS/NZS ISO 19011:2018 Guidelines for auditing management systems,* Auditing and Assurance Standard AUS 110 *Assurance Engagements other than Audits or Reviews of Historical Financial Information*, and International Standard on Quality Control ISQC 2009.

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

Where the auditor suggests opportunities for improvement, Sydney Water a 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 Sydney Water to first consider the pricing implications and value for money of continued improvement. Therefore, while we encourage Sydney 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 17 September 2024 to 19 September 2024. On 18 September 2024 the auditor also undertook a site visit to the following locations:

- Cascade Water Filtration Plant
- Faulconbridge Reservoir and Pumping Station
- Quakers Hill Water Resource Recovery Facility
- Stonecutters Ridge Golf Course recycled water supply point.

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

D 2024 audit scope

2024 operational audit scope
Sydney Water Corporation

This document sets out the 2024 operational audit scope for Sydney Water Corporation (Sydney Water).

We undertake annual audits of Sydney Water's compliance with its operating licence 2019-2024 (licence). We report to the Minister for Water on Sydney Water's compliance and the annual audits inform this report.

We have engaged Cobbitty Consulting Pty Ltd (auditor) to partner with us in delivering the 2024 audit.

Compliance period

The compliance period for the 2024 audit is from 1 July 2023 to 30 June 2024.

Audit scope

Licence clauses to be audited

Table 1 sets out the licence clauses that are included in the 2024 audit scope and identifies which clauses the auditor has checked versus those that we (IPART) have checked.

We do not audit Sydney Water's compliance with all licence clauses annually. We adopt a risk-based audit approach to deciding which licence clauses should be included in the annual audit scopes. This means that we audit 'high risk' clauses more frequently and 'low risk' clauses less frequently but aim to audit all auditable licence clauses at least once over the term of the licence.

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.

Auditing ongoing recommendations from previous audits

Table 2 sets out ongoing audit recommendations from previous audits for Sydney Water to rectify non-compliances. The auditor must review these recommendations to assess Sydney Water's progress in completing them by their due dates.

Input from government agencies

We consult with government agencies that Sydney Water has regulated relationships with under the licence to inform the audit scope. For the 2024 audit, we have received feedback from the Department of Climate Change, Energy, the Environment and Water (DCCEEW), the NSW Environment Protection Authority (EPA), Fire and Rescue NSW (FRNSW) and NSW Health about Sydney Water's performance during the compliance period.

Input from Sydney Water's statement of compliance

Sydney Water provides a Statement of Compliance (SC) by 1 September each year. The 2024 SC has informed the audit scope.

The SC is an exception-based report that outlines any non-compliances with the licence during the previous financial year that Sydney Water has self-identified. The financial year is different to the compliance period. The SC also identifies what remedial action Sydney Water has taken to rectify these non-compliances.

The audit process

We conduct audits in accordance with the Public Water Utility Audit Guideline. The 2024 audit process involves:

- receiving and reviewing reports
- undertaking and attending audit interviews with Sydney Water staff
- undertaking field verification to investigate how effectively the requirements of the licence are met in practice.

Table 3 lists the locations that we visited in previous audits that have informed how we have selected sites for visiting in 2024. We select these sites together with the auditor, incorporating feedback from NSW Health. We then liaise with Sydney Water before the field verification visits are scheduled to commence to consider any practical limitations.

Interpreting the audit scope in Table 1

We explain below how to use and interpret the audit scope in Table 1.

Key for interpreting the audit scope in Table 1

Requirement	Meaning
Audit/Internal IPART check	Audit/ check clause in 2024 audit
SC	This clause is not included in the 2024 audit scope. Sydney Water is still required to report any non-compliances against this clause in its Statement of Compliance. This information has input into the final 2024 audit scope.
NR	No requirement for audit.

Guidance for the auditor

Auditors should note any directions in the 'guidance for the auditor' column of Table 1. This guidance explains when a licence clause is not auditable, Sydney Water's historical compliance with previously audited licence clauses and inputs from other stakeholders.

Interpretation

In the case of any discrepancies between the licence and the audit scope in Table 1, the licence will prevail.

Table 1 2024 Audit scope for Sydney Water Corporation

Licence clause	Operating Licence obligation	2024 audit requirement	Comments for the auditor
1	**Licence and licence authorisation**		
1.1	**Objectives of this licence**		
1.1.1	The objectives of this Licence are to: a. authorise and require Sydney Water, within its Area of Operations, to: i. store or supply water ii. provide sewerage services iii. provide Stormwater Drainage Systems; and iv. dispose of Wastewater; and b. set efficient and effective terms and conditions, including quality and performance standards, that require Sydney Water to provide services in a way that: i. supports its principal objectives under the Act to protect public health and the environment; ii. supports its principal objective under the Act to be a successful business, including by having regard to the interest of the community; and iii. does not prevent or hinder competition.	NR	Information clause – does not require audit.
1.2	**Area of operations**		
1.2.1	This Licence applies to the Area of Operations specified in Schedule A.	NR	Information clause – does not require audit.
1.2.2	Sydney Water must publish on its website a map of its Area of Operations by 31 December 2019 (or another date approved by IPART in writing). Sydney Water must update the map within 30 days of any change to its Area of Operations.	SC	
1.3	**Term of this licence**		
1.3.1	The term of this Licence is four years from the Commencement Date. *[Note: On and from the Commencement Date, this Licence replaces any previous version of the operating licence granted to Sydney Water under section 12 of the Act.]*	NR	Information clause – does not require audit.
1.4	**Licence amendment**		
1.4.1	Subject to the Act and clause 1.4.2, the Governor may amend or substitute this Licence by notice in the New South Wales Government Gazette.	NR	Information clause – does not require audit.

1.4.2	Before notice of a proposed amendment to this Licence is tabled in Parliament under section 16 of the Act, the Minister must provide Sydney Water with reasonable notice of the proposed amendment to enable it to comply with the amendment if it takes effect. *[Note: The Customer Contract may be varied in accordance with section 59 of the Act and clause 14.2 of the Customer Contract. Such a variation is not an amendment to this Licence for the purpose of section 16 of the Act.]*	NR	Information clause – does not require audit.
1.5	**Non-exclusive licence**		
1.5.1	This Licence does not prohibit any other 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.
1.6	**Availability of licence**		
1.6.1	Sydney Water must make a copy of this Licence available to any person, free of charge: a. on its website; and b. upon request made to the Contact Centre.	SC	
1.7	**Pricing**		
1.7.1	Sydney Water must set the level of fees, charges, and other amounts payable for its Services in accordance with: a. the terms of the Licence; b. the Act; and c. any applicable maximum prices or methodologies for fixing maximum prices determined under the IPART Act.	SC	
1.8	**End of Term Review**		
1.8.1	IPART intends to review this Licence in its final year to investigate: a. whether this Licence is fulfilling its objectives; and b. any issues that have arisen during the term of this Licence that may impact its effectiveness, (the End of Term Review).	NR	Information clause – does not require audit.
1.8.2	To assist IPART with the End of Term Review, Sydney Water must provide IPART with such information as IPART reasonably requires. Sydney Water must provide IPART with such information as IPART requests within a reasonable time.	Internal IPART check	This clause is not included in the auditor's scope.
1.9	**Notices**		
1.9.1	Any notice or other communication given under this Licence must be: a. in writing addressed to the intended recipient; and b. delivered or sent to one of the addresses specified below (or the last address notified by the recipient), unless otherwise specified in the Reporting Manual. **Sydney Water**: Sydney Water, The Managing Director, Sydney Water, 1 Smith Street, Parramatta NSW 2150 **Minister**: The Hon. Melinda Pavey MP, GPO Box 5341, Sydney NSW 2001 **IPART**: 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.
1.9.2	Any requests for approval under the following clauses must be made by Sydney Water's Managing Director: 1.2.2, 3.1.7, 3.2.1, 3.2.6, 6.5.1, 6.6.6, 8.2.2, 8.2.3, 8.2.5, 8.2.6, 9.1.1, 8 or 9.3.1.	NR	Information clause – does not require audit.

2.1	**Licence authorisations**		
2.1.1	This Licence authorises and requires Sydney Water to provide, construct, operate, manage and maintain efficient, co-ordinated and commercially viable systems and services for providing the following Services within the Area of Operations: a. storing and supplying water; b. providing sewerage services; and c. disposing of Wastewater.	NR	Licence authorisation clause – does not require audit.
2.1.2	This Licence authorises and requires Sydney Water to provide, operate, manage and maintain a Stormwater Drainage System as described in section 14(1)(b) of the Act, except to the extent that the Minister is satisfied under sections 14(4) and 14(5) of the Act that satisfactory arrangements have been made for the applicable Service to be provided by another appropriate body.	NR	Licence authorisation clause– does not require audit.
2.1.3	This Licence authorises (but does not require) Sydney Water to provide, construct, operate, manage and maintain efficient, co-ordinated and commercially viable Stormwater Drainage Systems (and Services for providing those Stormwater Drainage Systems) within the Area of Operations in excess of the Stormwater Drainage System it is required to provide, operate, manage and maintain under clause 2.1.2. This includes increasing the capacity of the Stormwater Drainage System included in the business undertaking transferred under Part 3 of the Act from the Water Board to Sydney Water as at the date of the transfer of the business undertaking. *[Note: For the avoidance of doubt, the provision, management and maintenance of Stormwater Drainage Systems (and Services for providing those Stormwater Drainage Systems) under clause 2.1 may include stormwater quality management and other measures as necessary to manage impacts of stormwater on waterway health.]*	NR	Licence authorisation clause – does not require audit.
2.2	**Obligation to make services available**		
2.2.1	Sydney Water must ensure that Services for the supply of Drinking Water and disposal of Wastewater are available on request for connection to any Property situated in the Area of Operations for which a connection is available.	SC	
2.2.2	Sydney Water must provide Services for the supply of Drinking Water and disposal of Wastewater on request to any licensee under the WIC Act, where that licensee is connected to (or where a connection is available in respect of that licensee to) Sydney Water's water supply system or sewerage system.	SC	
2.2.3	Connection to Sydney Water's systems for the provision of Services for the supply of Drinking Water and disposal of Wastewater is subject to any reasonable conditions that Sydney Water may determine to ensure the safe, reliable and financially viable supply of Drinking Water and disposal of Wastewater to Properties.	NR	Licence authorisation clause – does not require audit.
3.1	**Economic approach for water conservation**		
3.1.1	Sydney Water must maintain a water conservation program consistent with the Current Economic Method.	SC	
3.1.2	Sydney Water must implement water conservation measures that have been assessed as economic as determined by the Current Economic Method.	SC	
3.1.3	Sydney Water must make: a. a copy of the Current Economic Method; b. a plain English summary of the Current Economic Method; and	SC	

	c. the economic level of water conservation (expressed as the value of water in dollars per kilolitre and as the quantity of savings in megalitres per day) determined in accordance with the Current Economic Method, available: d. to any person, free of charge upon request made to the Contact Centre; and e. on Sydney Water's website.		
3.1.4	Sydney Water must update the economic level of water conservation using the Current Economic Method: a. for the purposes of clause 3.1.1 and 3.1.2—annually; and b. or the purposes of clause 3.1.3(c)—monthly.	SC	
3.1.5	The Minister may, at any time during the term of this Licence and in writing, direct Sydney Water to revise the Current Economic Method in any way the Minister requires. *[Note: The Minister may request IPART to undertake a review of the Current Economic Method during the term of this Licence. Such review may precede a direction given under clause 3.1.5.]*	NR	Information clause – does not require audit but auditor should note this when auditing clause 3.1.6
3.1.6	Sydney Water must submit to the Minister the Current Economic Method revised in accordance with the written direction within: a. 30 days of receipt of that direction; or b. any other timeframe agreed by the Minister.	SC	Audit if triggered by a Ministerial direction under clause 3.1.5. **IPART** has sought confirmation from DCCEEW to confirm if the Minister made any directions to Sydney Water during the compliance period and has sought comment on Sydney Water's performance against this clause. DCCEEW has made no comments in response. We understand that the Minister did not make any directions during the compliance period.
3.1.7	If the Minister approves the revised Current Economic Method, he or she will give written notice of the approval to Sydney Water.	NR	Information clause – does not require audit but auditor should note this when auditing clause 3.1.6
3.2	**Water Planning**		
3.2.1	By 1 December 2020 (or another date approved by the Minister in writing), Sydney Water must develop, and submit to the Minister: a. a long-term capital and operational plan; and b. an emergency drought response plan.	NR	
3.2.2	The plans referred to in clause 3.2.1 must address any written guidance that the Minister provides to Sydney Water	NR	Information clause – does not require audit.
3.2.3	Sydney Water must use its best endeavours to develop the plans referred to in clause 3.2.1 in cooperation with Water NSW.	NR	Information clause – does not require audit.
3.2.4	Sydney Water must implement any action that: a. Sydney Water is responsible for delivering under the Metropolitan Water Plan; or b. the Minister directs, in writing, Sydney Water to implement.	NR	The Metropolitan Water Plan has been superseded by the Greater Sydney Water Strategy and this clause no longer applies.

			IPART has sought confirmation from DCCEEW if the Minister made any directions to Sydney Water to undertake actions under the Greater Sydney Water Strategy (which has replaced the MWP) during the compliance period and has sought comment on Sydney Water's performance against this clause. DCCEEW has made no comments in response. We understand that the Minister did not make any directions during the compliance period.
3.2.5	Sydney Water must participate cooperatively in any review of the Metropolitan Water Plan.	NR	The Metropolitan Water Plan has been superseded by the Greater Sydney Water Strategy and this clause no longer applies.
3.2.6	Sydney Water must develop and enter into a data sharing agreement with DPE by the Commencement Date (or another date approved by the Minister in writing) to assist in the development and review of the Metropolitan Water Plan (the Data Sharing Agreement)	NR	
3.2.7	In addition to any other matters agreed by Sydney Water and DPE, the Data Sharing Agreement must: a. set out the roles and responsibilities of Sydney Water and DPE under the Data Sharing Agreement; b. set out the types of data that are covered by the Data Sharing Agreement; c. set out the purposes for the sharing of data and information; d. set out the requirements that shared data and information must meet; e. identify agreed timelines and the format for sharing data and information; and f. identify procedures for resolving matters of conflict in providing data and information.	SC	
3.2.8	Once Sydney Water has entered into the Data Sharing Agreement it must comply with the Data Sharing Agreement.	SC	
3.2.9	Sydney Water must provide any data or information requested by the Minister in writing: a. by the date specified by the Minister; and b. to the Minister or, if the Minister so directs, to DPE.	SC	Audit if triggered by a Ministerial request in writing **IPART** has sought confirmation from DCCEEW to confirm if the Minister sent any requests to Sydney Water during the compliance period and has sought comment on Sydney Water's performance against this clause. DCCEEW has replaced the previous DPE. DCCEEW has made no comments in response. We understand that the Minister did not make any directions during the compliance period.

3.3	**Priority Sewerage Program**		
3.3.1	Sydney Water must participate cooperatively in any NSW Government review of the Priority Sewerage Program.	SC	Audit if triggered by a NSW Government review of the Priority Sewerage Program.
3.3.2	If required by the Minister, Sydney Water must implement and comply with any outcomes (including timeframes) of any NSW Government review of the Priority Sewerage Program. *[Note: The areas to which the Priority Sewerage Program applies are Austral, Menangle, Menangle Park, Nattai, Scotland Island and Yanderra as listed in Schedule B of this Licence.]*	SC	Audit if triggered by a Ministerial direction in writing. Audit together with clause 3.3.1. **IPART** has sought confirmation from DCCEEW to confirm if the Minister sent any directions to Sydney Water during the compliance period and has sought comment on Sydney Water's performance against this clause. DCCEEW has made no comments in response. We understand that the Minister did not make any directions during the compliance period.
4.1	**Drinking Water**		
4.1.1	Sydney Water must maintain a Management System that is consistent with the Australian Drinking Water Guidelines and any requirements relating to Drinking Water specified by NSW Health (the Drinking Water Quality Management System)	SC	**IPART** has sought comments from NSW Health on Sydney Water's performance against this clause. NSW Health's comments are summarised under clause 4.1.3 below.
4.1.2	In the event of inconsistency between the requirements specified by NSW Health referred to in clause 4.1.1 and the Australian Drinking Water Guidelines, the requirements specified by NSW Health prevail.	NR	Information clause – does not require audit but auditor should note this when auditing clause 4.1.1.
4.1.3	Sydney 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. *[Note: Sydney Water is to apply the Drinking Water Quality Management System to the Drinking Water system under its control, having regard to the entire Drinking Water supply system – from the water catchment to the Consumer.]*	Audit	**Auditor** to check implementation of all elements of Sydney Water's drinking water quality management system. We last audited this clause in 2023 and assigned a Compliant (Minor shortcomings) grade. **Auditor** to check Sydney Water's progress with completing recommendations 2023-01, 2023-02 and 2022-03 by their due dates (see Table 3). **IPART** has sought comments from NSW Health on Sydney Water's performance against this clause. NSW Health has:

			• provided feedback on performance • recommended the **auditor** consider Sydney Water's progress on consistency of controls for critical processes across plants and prioritising and addressing outstanding issues with assets • suggested sites to visit.
4.2	**Recycled Water**		
4.2.1	Sydney Water must maintain a Management System that is consistent with the Australian Guidelines for Water Recycling and any requirements relating to water recycling specified by NSW Health (the Recycled Water Quality Management System).	SC	**Auditor** to check Sydney Water's progress with completing Recommendation 2023-03 by its due date (see Table 3). **IPART** has sought comments from NSW Health on Sydney Water's performance against this clause. NSW Health's comments are summarised under clause 4.2.3 below.
4.2.2	In the event of inconsistency between the requirements specified by NSW Health referred to in clause 4.2.1 and the Australian Guidelines for Water Recycling, the requirements specified by NSW Health prevail.	NR	Information clause – does not require audit but auditor should note this when auditing clause 4.2.1.
4.2.3	Sydney 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	**Auditor** to check implementation of all elements of Sydney Water's recycled water quality management system. We last audited this clause in 2023 and assigned a Non-compliant (non-material) grade. **Auditor** to check Sydney Water's progress with completing the following recommendations by their due dates (see Table 3): • 2023-04 • 2023-05 • 2023-06 • 2023-07 • 2023-08 • 2023-09 • 2023-12 **IPART** has sought comments from NSW Health on Sydney Water's performance against this clause. NSW Health has: • provided feedback on performance

			• recommended the **auditor** consider Sydney Water's progress on consistency of controls for critical processes across plants and prioritising and addressing outstanding issues with assets • suggested sites to visit.
4.3	**Fluoridation Code**		
4.3.1	Sydney Water must comply with the Fluoridation Code and any requirements for fluoridation specified by NSW Health.	Audit	We last audited this clause in 2021 and assigned a Compliant grade. **IPART** has sought comments from NSW Health on Sydney Water's performance against this clause. NSW Health has: • provided feedback on performance • recommended the **auditor** consider Sydney Water's progress on consistency of controls for critical processes across plants and prioritising and addressing outstanding issues with assets • suggested sites to visit.
4.3.2	In the event of inconsistency between the requirements specified by NSW Health referred to in clause 4.3.1 and the Fluoridation Code, the requirements specified by NSW Health prevail.	NR	Information clause – does not require audit but auditor should note this when auditing clause 4.3.1.
5.1	**Water Continuity Standard**		
5.1.1	Sydney Water must ensure that, in each financial year, at least 9,800 Properties per 10,000 Properties (in respect of which Sydney Water provides a Drinking Water supply service) receive a Drinking Water supply service unaffected by an Unplanned Water Interruption (the Water Continuity Standard).	Audit	We last audited this clause in 2021 and assigned a Compliant grade.
5.1.2	Sydney Water must use: a. the Water Continuity Optimal Level; and b. the Water Continuity Tolerance Band, as inputs to decisions regarding the design, construction, operation and maintenance of its water supply system.	SC	
5.1.3	For the purposes of clause 5.1.2: a. the Water Continuity Optimal Level is 9,840 Properties per 10,000 Properties (in respect of which Sydney Water provides a Drinking Water supply service) in each financial year receiving a Drinking Water supply service unaffected by an Unplanned Water Interruption; and b. the Water Continuity Tolerance Band is the band of deviations from the Water Continuity Optimal Level between: i. the mandatory Water Continuity Standard (specified in clause 5.1.1 above); and	NR	Information clause – does not require audit but auditor should note this when auditing clause 5.1.2.

	ii. an upper bound of 9,880 Properties per 10,000 Properties (in respect of which Sydney Water provides a Drinking Water supply service) in each financial year receiving a Drinking Water supply service unaffected by an Unplanned Water Interruption. *[Note: Clause 5.1.2 requires Sydney Water to use the Water Continuity Optimum Level and Water Continuity Tolerance Band as inputs into certain decisions. If Sydney Water complies with clause 5.1.2, it will be compliant with this clause 5.1 even if the number of Properties unaffected by an Unplanned Water Interruption exceeds the upper bound of the Water Continuity Tolerance Band. However, IPART may consider the prudency and efficiency of any expenditure related to this level of performance at the next review of Sydney Water's prices.]*		
5.1.4	Sydney Water must use the best available data (taking account of water pressure data, where available) to determine whether a Property has experienced an Unplanned Water Interruption.	Audit	We last audited this clause in 2021 and assigned a Compliant grade.
5.1.5	If a Property experiences an Unplanned Water Interruption that was caused by a Third Party or a power failure, the Property is taken not to have experienced an Unplanned Water Interruption for the purposes of this clause 5.	NR	Information clause – does not require audit but auditor should note this when auditing clause 5.1.
5.1.6	For the purpose of the Water Continuity Standard, Water Continuity Optimal Level and Water Continuity Tolerance Band: a. each separately billed part of a Multiple Occupancy Property is to be counted as a separate Property; and *[Note: For example, a complex of five townhouses where each townhouse receives a separate Bill from Sydney Water is to be counted as five separate Properties. However, a block of five flats that only receives one Bill from Sydney Water is to be counted as a single Property.]* b. each separate instance, in a financial year, of a single Property experiencing an Unplanned Water Interruption is to be counted as a separate Property that has experienced an Unplanned Water Interruption.	NR	Information clause – does not require audit but auditor should note this when auditing clause 5.1.
5.2	**Water Pressure Standard**		
5.2.1	Sydney Water must ensure that, in each financial year, at least 9,999 Properties per 10,000 Properties (in respect of which Sydney Water provides a Drinking Water supply service) receive a Drinking Water supply service affected by fewer than 12 Water Pressure Failures (the Water Pressure Standard).	Audit	We last audited this clause in 2020 and assigned a Compliant grade.
5.2.2	A Property is taken to have experienced a Water Pressure Failure when: a. a person notifies Sydney Water that the Property has experienced a Water Pressure Failure and Sydney Water confirms that the Property has experienced a Water Pressure Failure; or b. Sydney Water identifies that the Property has experienced a Water Pressure Failure (including through its data collection systems and hydraulic analysis).	NR	Information clause – does not require audit but auditor should note this when auditing clause 5.2.
5.2.3	A Property will not be taken to have experienced a Water Pressure Failure if that Water Pressure Failure occurred only because of: a. water usage in the case of a fire or other abnormal demand; or	NR	Information clause – does not require audit but auditor should note this when auditing clause 5.2.

	b. a short term or temporary operational problem (such as a main break), including where caused by a Third Party, that is remedied within four days of its commencement.		
5.2.4	For the purpose of the Water Pressure Standard: a. where a Property experiences multiple Water Pressure Failures in a day, only one of those Water Pressure Failures is to count as a Water Pressure Failure experienced by that Property; b. where a Property experiences a Water Pressure Failure that affects more than one day, each day affected is to be counted as a separate Water Pressure Failure; c. each separately billed part of a Multiple Occupancy Property is to be counted as a separate Property; *[Note: For example, a complex of five townhouses where each townhouse receives a separate Bill from Sydney Water is to be counted as five separate Properties. However a block of five flats that only receives one Bill from Sydney Water is to be counted as a single Property.]* d. each Property that is affected by 12 or more Water Pressure Failures in a financial year is to be counted once only as a Property that has been affected by 12 or more Water Pressure Failures in that financial year; and e. after 30 June 2020, where a Property in, or in the vicinity of, a Property Cluster, is connected for the first time to Sydney Water's Drinking Water supply system and Sydney Water has informed the owner (at the time of connection) of: i. the risk of recurring Water Pressure Failures should the Property be connected to that system; and ii. options to reduce that risk; that Property is not to be counted for the purposes of the Water Pressure Standard.	NR	Information clause – does not require audit but auditor should note this when auditing clause 5.2.
5.2.5	For each Property Cluster, Sydney Water must: a. by 30 June 2020, review its business processes to ensure that no Property at risk of being affected by recurring Water Pressure Failures from the same cause is connected to Sydney Water's Drinking Water supply system, unless the owner (at the time of connection) is: i. informed of that risk; and ii. provided with options to reduce that risk; and b. by 31 October 2022, take steps to minimise or eliminate the risk of recurring Water Pressure Failures from that cause, in a manner that takes into account its Customers' willingness to pay for Drinking Water supply services.	NR	Fixed deadline requirement (only required to be audited in year of deadline) – completed.
5.3	**Dry Weather Wastewater Overflow Standard**		
5.3.1	Sydney Water must ensure that, in each financial year, at least: a. 9,928 Properties per 10,000 Properties (in respect of which Sydney Water provides a sewerage service but excluding Public Properties) receive a sewerage service unaffected by an Uncontrolled Wastewater Overflow; and b. 9,999 Properties per 10,000 Properties (in respect of which Sydney Water provides a sewerage service but excluding Public Properties) receive a sewerage service affected by fewer than three Uncontrolled Wastewater Overflows,	Audit	We last audited this clause in 2021 and assigned a Compliant grade. **IPART** has sought comments from the EPA on Sydney Water's performance against this clause.

	(the Dry Weather Wastewater Overflow Standard).		EPA provided feedback on Sydney Water's performance against its environmental protection licences as context for auditing this licence clause.
5.3.2	A Property is taken to have experienced an Uncontrolled Wastewater Overflow when: a. a person notifies Sydney Water that a Property has experienced a sewage overflow, where Sydney Water later confirms that the sewage overflow is an Uncontrolled Wastewater Overflow; or b. Sydney Water's systems identify that a Property has experienced an Uncontrolled Wastewater Overflow.	NR	Information clause – does not require audit but auditor should note this when auditing clause 5.3.
5.3.3	For the purpose of the Dry Weather Wastewater Overflow Standard: a. each Multiple Occupancy Property is to be counted as a single Property; [Note: For example, a complex of five townhouses where each townhouse receives a separate Bill from Sydney Water is to be counted as a single Property.] b. for the purpose of clause 5.3.1(a), each separate instance, in a financial year, of a single Property experiencing an Uncontrolled Wastewater Overflow is to be counted as a separate Property that has experienced, in that financial year, an Uncontrolled Wastewater Overflow; and c. for the purpose of clause 5.3.1(b), each Property that experiences three or more Uncontrolled Wastewater Overflows in a financial year is to be counted once only as a Property that has experienced three or more Uncontrolled Wastewater Overflows in that financial year.	NR	Information clause – does not require audit but auditor should note this when auditing clause 5.3.
5.4	**Interpretation of standards**		
5.4.1	In the case of any ambiguity in the interpretation or application of the Water Continuity Standard, the Water Pressure Standard, the Dry Weather Wastewater Overflow Standard or clause 5.2.5, IPART's interpretation or assessment of the standard or clause will prevail.	NR	Information clause – does not require audit but auditor should note this when auditing clauses 5.1, 5.2 and 5.3.
5.5	**Asset Management**		
5.5.1	Sydney Water must maintain a Management System in relation to Sydney Water's Assets that is consistent with the Australian Standard AS ISO 55001:2014 Asset management – Management systems – Requirements (the Asset Management System).	SC	
5.5.2	Sydney Water must ensure that the Asset Management System is fully implemented and that all relevant activities are carried out in accordance with the Asset Management System.	Audit	We last audited this clause in 2023 and assigned a Non-Compliant (Non-material) grade. **Auditor** to check Sydney Water's progress with completing Recommendation 2023-10 by its due date (see Table 3)
6.1	**Customer contract**		
6.1.1	The Customer Contract sets out the rights and obligations of Customers and Sydney Water in relation to the Services provided in accordance with this Licence. The Customer Contract is set out in Schedule C of this Licence.	NR	Information clause – does not require audit.

6.1.2	Sydney Water must make a copy of the Customer Contract available to any person, free of charge: a. on its website; and b. upon request made to the Contact Centre.	SC	
6.2	**Providing information to Customers**		
6.2.1	Sydney Water must prepare one or more communications that: a. provide a brief explanation of the Customer Contract; b. summarise the key rights and obligations of Customers under the Customer Contract; c. refer to the types of account relief available for Customers experiencing financial hardship; d. outline the rights of Customers to claim a rebate and the conditions that apply to those rights; e. contain information regarding how to contact Sydney Water by telephone, email or post; and f. contain information regarding the ability of a Customer to enter into agreements with Sydney Water separate to the Customer Contract for the provision of Services by Sydney Water to the Customer.	SC	
6.2.2	Sydney Water must update the communication or communications to reflect any variations made to the Customer Contract.	SC	
6.2.3	Sydney Water must: a. provide the communication or communications and any updates, free of charge to: i. Customers at least annually with their Bills; and ii. any person upon request made to the Contact Centre; and b. make the communication or communications and any updates publicly available on its website, free of charge, within 60 days of the commencement of the Customer Contract or any communication update.	SC	
6.2.4	Sydney Water must publish on its website and advertise at least annually in a manner that Sydney Water is satisfied is likely to come to the attention of members of the public, information as to: a. the types of account relief available for Customers experiencing payment difficulty; and b. rights of Customers to claim rebates and the conditions that apply to those rights.	SC	
6.3	**Consumers**		
6.3.1	Sydney Water's obligations under the following clauses of the Customer Contract are extended to Consumers as though the Consumers were parties to the Customer Contract: a. clause 5.1 (Payment difficulties and assistance options for all customers); b. clause 6.5 (Occupiers (tenants) may pay charges to avoid restriction or disconnection); c. clause 12 (If I am unhappy with the service provided by Sydney Water what can I do?); d. clause 13 (Consultation, information and privacy); and e. clause 14 (When does this contract with Sydney Water terminate?).	NR	Information clause – does not require audit.
6.4	**Assistance Options for Payment Difficulties and Actions for Non-Payment**		
6.4.1	Sydney Water must maintain and fully implement:	SC	

	a. a payment difficulty policy that assists residential Customers experiencing payment difficulty to better manage their current and future Bills; b. procedures relating to a payment plan for residential Customers who are responsible for paying their Bills and who are, in Sydney Water's reasonable opinion, experiencing payment difficulty; c. procedures for identifying the circumstances under which Sydney Water may disconnect or restrict the supply of water to a Customer's Property; and d. provisions for self-identification, identification by community welfare organisations and identification by Sydney Water of residential Customers experiencing payment difficulty, (the Assistance Options for Payment Difficulties and Actions for Non-Payment).	
6.4.2	Sydney Water must provide, free of charge, an explanation of the Assistance Options for Payment Difficulties and Actions for Non-Payment on its website and to: a. all residential Customers, at least annually with their Bills; b. residential Customers who Sydney Water identifies as experiencing payment difficulty on the date that Sydney Water first identifies that the Customer is experiencing payment difficulty; and c. any other person upon request made to the Contact Centre.	SC
6.5	**Family Violence**	
6.5.1	Sydney Water must develop and implement a family violence policy by 1 July 2020 (or another date approved by IPART in writing).	SC
6.5.2	The family violence policy must, at a minimum, provide for: a. the protection of private and confidential information; b. access to payment difficulty programs; c. processes that minimise the reliance on individuals to disclose their family violence; and d. processes for referrals to specialist services.	SC
6.6	**Customer engagement**	
6.6.1	Sydney Water must undertake customer engagement to understand its customers' preferences and willingness to pay for service levels. The customer engagement must be relevant, representative, proportionate, objective, clearly communicated and accurate.	SC
6.6.2	Sydney Water must establish and regularly consult with its Customer Council.	SC
6.6.3	Sydney Water must provide the Customer Council with information in Sydney Water's possession or under its custody or control necessary to enable the Customer Council to discharge the tasks assigned to it, other than information or documents that are confidential or privileged.	SC
6.6.4	Sydney Water must keep minutes of proceedings of the Customer Council and make a copy of the minutes available to any person, free of charge, upon request made to the Contact Centre.	SC

6.6.5	Sydney Water must undertake a review of the operation of the Customer Council. The review must include an assessment of the Customer Council's role, objectives, outcomes and membership, including whether the Customer Council could be used to better support customer engagement, as required by clause 6.6.1.	SC	
6.6.6	Sydney Water must report to IPART on the completed review and its outcomes by 30 June 2020 (or another date approved by IPART in writing).	NR	Fixed deadline requirement. Completed.
6.7	**Internal complaints handling**		
6.7.1	Sydney Water must maintain a procedure for receiving, responding to and resolving Complaints. The procedure must be consistent with Australian Standard AS/NZS 10002:2014 – Guidelines for complaint management in organizations (the Internal Complaints Handling Procedure).	SC	
6.7.2	Sydney 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	SC	
6.7.3	Sydney Water must provide to Customers, at least annually with their Bills, information concerning internal Complaints handling. The information must explain how to make a Complaint and how Sydney Water will receive, respond to and resolve Complaints.	SC	
6.7.4	Sydney Water must make the information concerning internal Complaints handling referred to in clause 6.7.3 available to any person, free of charge: a. on its website; and b. upon request made to the Contact Centre.	SC	
6.8	**External dispute resolution scheme**		
6.8.1	Sydney Water must be a member of the Energy & Water Ombudsman NSW to facilitate the resolution of disputes between Sydney Water and its Customers and Consumers.	SC	
6.8.2	Sydney Water must: a. prepare a communication that: i. lists the dispute resolution services provided by the Energy & Water Ombudsman NSW, including any right to have a Complaint or dispute referred to the Energy & Water Ombudsman NSW; and ii. explains how a Consumer can contact the Energy & Water Ombudsman NSW; b. provide a copy of that communication, free of charge to Customers at least once a year with their Bills; and c. make a copy of that communication available to any person, free of charge: i. on its website; and ii. upon request made to the Contact Centre.	SC	
7.1	**Memoranda of Understanding with WAMC, NSW Health and EPA**		
7.1.1	Sydney Water must maintain the memoranda of understanding entered into under section 35 of the Act with: a. the Water Administration Ministerial Corporation (WAMC); b. the Secretary of the Ministry of Health (NSW Health); and c. the Environment Protection Authority (EPA).	SC	**IPART** has sought comments from DCCEEW (on behalf of WAMC), NSW Health and the EPA on Sydney Water's performance against this clause.

			DCCEEW made no comments in response. NSW Health and the EPA reported that Sydney Water has performed effectively under this licence clause.
7.1.2	The purpose of the memoranda of understanding referred to in clause 7.1.1 is to form the basis for cooperative relationships between the parties. In particular: a. the purpose of the memorandum of understanding with WAMC is to recognise the role of WAMC in regulating water access, use and management and Sydney Water's right to use water vested in WAMC; b. the purpose of the memorandum of understanding with NSW Health 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 which is safe to drink; and c. the purpose of the memorandum of understanding with EPA is to recognise the role of EPA as the environment regulator of New South Wales and to commit Sydney Water to environmental obligations.	NR	Information clause – does not require audit.
7.2	**Memorandum of Understanding with FRNSW**		
7.2.1	Sydney Water must use its best endeavours to maintain a memorandum of understanding with Fire and Rescue NSW (FRNSW).	SC	**IPART** has sought comments from FRNSW on Sydney Water's performance against this clause. FRNSW has noted improvements in this compliance period in Sydney Water's performance under this licence clause.
7.2.2	Sydney Water must use its best endeavours to comply with the memorandum of understanding with FRNSW.	SC	**IPART** has sought comments from FRNSW on Sydney Water's performance against this clause. FRNSW has noted improvements in this compliance period in Sydney Water's performance under this licence clause. We last audited this clause in 2023 and assigned a Compliant (minor shortcomings) grade. This clause does not require audit this year but the **auditor** is to check Sydney Water's progress with completing Recommendation 2023-11 by its due date (see Table 3). Sydney Water will remain assessed as Compliant (minor shortcomings) with this clause until the recommendations are completed.

7.2.3	The purpose of the memorandum of understanding with FRNSW is to form the basis for cooperative relationships between the parties. In particular, the purpose is to: a. develop the roles and responsibilities of the parties as they relate to each other; b. identify the needs and constraints of the parties as they relate to each other; and c. identify and develop strategies for efficient and effective provision of firefighting water consistent with the goals of each party.	NR	Information clause – does not require audit.
7.2.4	The memorandum of understanding with FRNSW must require the maintenance of a working group and must provide that: a. the working group must include representatives from Sydney Water and FRNSW and may include representatives from other organisations such as the NSW Rural Fire Service; and b. the working group is to consider the following matters (at a minimum): i. information sharing arrangements between Sydney Water and FRNSW; ii. agreed timelines and a format for Sydney 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 Sydney Water to consult with FRNSW in the design of new assets and planning of system maintenance, where planning indicates that minimum available flow and pressure may unduly impact firefighting in the network section under consideration; and iv. other matters as agreed by both Sydney Water and FRNSW.	SC	**IPART** has sought comments from FRNSW on Sydney Water's performance against this clause. FRNSW has made no specific comments in response to this licence clause.
8.1	**Negotiations with WIC Act licensees and Potential Competitors**		
8.1.1	Sydney Water must negotiate the provision of Services to WIC Act licensees and Potential Competitors in Good Faith.	Audit	We last audited this clause in 2020 but concluded that the clause was not triggered in that compliance period (and therefore, we did not assign an audit grade).
8.2	**Publications of servicing information**		
8.2.1	Sydney Water must, by the dates specified in this clause 8.2, publish electronically (in a form accessible from its website) at least ten years of servicing information for each major water system and wastewater system. The servicing information for each major water system and wastewater system must, at a minimum, include information on: a. current and projected demand; b. current and projected capacity constraints; c. indicative costs of alleviating or deferring capacity constraints; d. locations where further investigation is needed; and e. key sources of information used to develop the servicing information where those sources are publicly available, (the Servicing Information).	NR	Information clause – does not require audit but auditor should note this when auditing clause 8.2.

8.2.2	Sydney Water must, by 30 September 2020 (or another date approved by IPART in writing), publish electronically the Servicing Information for each major water system and wastewater system that it has available by that date that is in a form suitable for publication.	NR	Fixed deadline requirement. Completed.
8.2.3	Sydney Water must continue to publish Servicing Information for each major water system and wastewater system as it becomes available. Sydney Water must publish all Servicing Information by 30 June 2021 (or another date approved by IPART in writing).	NR	Fixed deadline requirement. Completed.
8.2.4	Sydney Water must publish updated Servicing Information for each major water system and wastewater system as soon as practicable after any such updated Servicing Information becomes available in a form suitable for publication.	SC	Audit if triggered by updates to published servicing information.
8.2.5	Sydney Water must review and update the Servicing Information for each major water system and wastewater system at least once between: a. The date that is 12 months after the initial publication of the Servicing Information for that major water system or wastewater system under clause 8.2.2; and b. 30 June 2023 (or another date approved by IPART in writing).	NR	Fixed deadline requirement. Completed.
8.2.6	Sydney Water is not required to comply with clauses 8.2.1 to 8.2.5 in relation to a particular major water system or wastewater system to the extent approved by IPART in writing. Sydney Water may apply to IPART for approval under this clause only where there are critical infrastructure security concerns in relation to a particular major water system or wastewater system.	NR	Information clause – does not require audit but auditor should note this when auditing clause 7.2.
8.3	**Code of Conduct**		
8.3.1	Sydney Water must use its best endeavours to cooperate with each WIC Act licensee to establish a code of conduct required by a WIC Act licence where Sydney Water has received a written request from the WIC Act licensee to establish such a code.	Audit	We last audited this clause in 2020 but concluded that the clause was not triggered in that compliance period (and therefore, we did not assign an audit grade).
8.3.2	Where the Minister administering the WIC Act has established a code of conduct under clause 25 of the WIC Regulation, Sydney Water will be taken to have satisfied its obligation under clause 8.3.1 by applying the code of conduct to the relevant licensee under the WIC Act.	NR	Information clause – does not require audit but auditor should note this when auditing clause 8.3.1.
9.1	**Cyber Security Management System**		
9.1.1	From the Commencement Date (or another date approved by IPART in writing), Sydney Water must maintain a Management System for cyber security of Sydney Water's Assets (the Cyber Security Management System) that covers: a. information technology environments, hardware and systems; and b. operational technology environments, hardware and systems	NR	Audited separately by Cyber Security specialist auditor.
9.1.2	From the Commencement Date (or another date approved by IPART in writing), Sydney Water must ensure that the Cyber Security Management System is fully implemented and that all relevant activities are carried out in accordance with the Cyber Security Management System.	NR	Audited separately by Cyber Security specialist auditor.
9.2	**Critical infrastructure Compliance manager**		
9.2.1	Sydney Water must nominate, by notice in writing to IPART and the Commonwealth Representative, an executive level employee as Critical Infrastructure Compliance Manager.	NR	Audited separately by Cyber Security specialist auditor.

	[Note: The reference to an executive level employee is a reference to a Level 3 employee or above under Sydney Water's structure at the Commencement Date.]		
9.2.2	Sydney Water's Critical Infrastructure Compliance Manager must be responsible for compliance with clause 9 of the Licence and Sydney Water's obligations under the *Security of Critical Infrastructure Act 2018* (Cth) and must act as the contact person for the Commonwealth Representative.	NR	Audited separately by Cyber Security specialist auditor.
9.3	**National Security Clearances**		
9.3.1	From 1 January 2020 (or another date approved by IPART in writing), Sydney Water must ensure that National Security Clearances are held by its Critical Infrastructure Compliance Manager, two board members and the executive level employees responsible for each of the following matters: a) operational technology security (including cyber security strategy, managing remote access to Assets and delivery of SCADA capability); b) network operations security (including operation, maintenance and physical security of Assets); and c) Personnel security operations (including security of Personnel and security risks posed by Personnel). *[Note: The responsibilities at (a) to (c) above may be held by a single employee or shared between multiple employees. To ensure compliance with this clause when employees resign or are on leave, Sydney Water should ensure that National Security Clearances are held by alternates with relevant experience.]*	NR	Audited separately by Cyber Security specialist auditor.
10.1	**Operational Audits**		
10.1.1	Sydney Water must cooperate with an audit undertaken by IPART or an Auditor of Sydney Water's compliance with any of the following: a. this Licence (including the Customer Contract); b. the Reporting Manual; and c. any matters specified by the Minister, (the Operational Audit).	SC	.
10.1.2	For the purpose of any Operational Audit or verifying a report on an Operational Audit, Sydney Water must, within a reasonable period of receiving a request from IPART or an Auditor, provide IPART or the Auditor with all the information in Sydney Water's possession, custody or control that is necessary to conduct the Operational Audit, including any information that is reasonably requested by IPART or an Auditor.	SC	
10.1.3	For the purpose of any Operational Audit or verifying a report on an Operational Audit, Sydney Water must permit IPART or the Auditor to: a. access any works, premises or offices occupied by Sydney 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 purpose 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 Sydney Water that are maintained in relation to the performance of Sydney Water's obligations under this Licence (including the Reporting Manual); and	SC	

	e. discuss matters relevant to the Operational Audit or any report on the Operational Audit with Sydney Water, including Sydney Water's officers and employees.		
10.2	**Reporting**		
10.2.1	IPART has the function of determining Sydney Water's reporting and auditing obligations and publishing these obligations in a reporting manual (the Reporting Manual).	NR	Information clause – does not require audit.
10.2.2	Sydney Water must comply with all of its reporting and auditing obligations set out in the Reporting Manual, including in relation to: a. water conservation and planning; b. performance standards for water quality c. performance standards for service interruptions; d. Customers and Consumers; e. information and services for competitors; f. critical infrastructure security; and g. performance monitoring and reporting.	Audit (sub-clauses (a)-(e) only) Internal IPART check sub-clauses (f) and (g)	We last audited this clause in 2021 and assigned a Non-Compliant (non-material) grade. We have not since re-audited the clause but we confirmed that Sydney Water completed the recommendation from the 2021 audit to rectify this non-compliance (Recommendation 2021-15). There are no outstanding recommendations for the auditor to check.
10.2.3	Sydney Water must: a. compile indicators of the direct impact on the environment of Sydney Water's activities (the Environment Performance Indicators). The Environment Performance Indicators must be consistent with the performance indicators specified in the Reporting Manual with an indicator number starting with 'E'; b. monitor and compile data on the Environment Performance Indicators, including data that allows a year to year comparison of the Environment Performance Indicators; and c. report on the Environment Performance Indicators in accordance with the Reporting Manual.	Audit	We last audited this clause in 2021 and assigned a Non-Compliant (non-material) grade. We have not since re-audited the clause but we confirmed that Sydney Water completed the recommendation from the 2021 audit to rectify this non-compliance (Recommendation 2021-16). There are no outstanding recommendations for the auditor to check.
10.2.4	Sydney Water must maintain sufficient record systems to enable Sydney Water to report accurately in accordance with this clause 10.2.	SC	
10.2.5	In the case of any disagreement between IPART and Sydney Water regarding the interpretation or application of any requirements of the Reporting Manual, IPART's interpretation or assessment of the application of the requirements will prevail.	NR	Information clause – does not require audit but auditor should note this when auditing clause 10.2.
10.3	**Provision of information for performance monitoring**		
10.3.1	Sydney Water must provide IPART information relating to the performance of any of Sydney Water's obligations under clause 10.2 (including providing IPART physical and electronic access to the records required to be kept under clause 10.2) within a reasonable time of Sydney Water's receiving a request from IPART for that information.	SC	
10.3.2	Sydney Water must provide IPART such information as is reasonably required to enable IPART to conduct any review or investigation of Sydney Water's obligations under this Licence within a reasonable time of Sydney Water receiving a request from IPART for that information.	SC	
10.3.3	If Sydney Water engages any person (including a subsidiary) to undertake any activities on its behalf, 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 clause 10.1 as if that person were Sydney Water.	SC	

10.3.4	If IPART or an Auditor requests information that is confidential, the information must be provided to IPART or the Auditor, subject to IPART or the Auditor entering into reasonable arrangements to ensure that the information remains confidential.	SC	
10.3.5	Sydney Water must provide NSW Health with information relating to water quality in the manner and form specified by NSW Health within a reasonable time of receiving NSW Health's request. [Note: Under section 19 of the Public Health Act 2010 (NSW), the Secretary of NSW Health may require Sydney Water to produce certain information.]	SC	

Table 2 Recommendations / outstanding items from previous audits

Recommendation number	Operational issue (licence reference where applicable)	IPART's recommendation to the Minister	Progress on Audit findings (Status as reported by Sydney Water in audit recommendations update on 31 May 2024[a])	Guidance for 2024 audit
2023-01	Drinking water Clause 4.1.3	By 31 December 2024, Sydney Water is to ensure that there is a process in place to provide contractors performing network repairs with adequate training to undertake works to the specified hygienic requirements and protect water quality (e.g. hygienic storage and repairs, adequate flushing, testing etc). In addition, a process must be in place to verify that these practices are being implemented by contractors (relates to Element 3)	New recommendation from the 2023 operational audit - On track Sydney Water advised that Water quality awareness training is scheduled to be delivered to the contractors in March 2024. Contract managers are developing audit checklists to conduct audits to ensure overall contractor performance, which includes water quality. This training will be made part of the onboarding/induction training for new contract staff to ensure this awareness is maintained.	Auditor to check Sydney Water's progress against the recommendation.
2023-02	Drinking water Clause 4.1.3	By 31 December 2024, review implementation of the process for closing incidents and undertaking incident debriefs (internal and multi-agency) as per Sydney Water's Incident Management Procedure and Incident Debrief and Investigation Procedure and undertake an awareness session with all relevant staff to enable the procedures to be fully implemented (Element 6).	New recommendation from the 2023 operational audit - On track Education and awareness program will be in place once enterprise level policies for incident management and debriefs are refined and implemented. Policy refinements are underway with completion expected by June 2024.	Auditor to check Sydney Water's progress against the recommendation.
2023-03:	Recycled water Clause 4.2.1	a) By 31 December 2024, Sydney Water must amend its existing process for connecting properties to the recycled water network to ensure that avoidable cross-connections are eliminated. b) By 31 December 2024, Sydney Water should also quantify the public health risk of existing properties and put appropriate controls in place, which may include the auditing of existing connections. This review must be undertaken in collaboration with NSW Health and the Department of Fair Trading (relates to Element 3).	New recommendation from the 2023 operational audit - On track a. Process map being developed to ensure we understand the end to end process of connections in recycled water areas, including assurance checks. Legal has undertaken a review of regulatory framework to clarify main to meter responsibility.	Auditor to check Sydney Water's progress against the recommendation.

			b. Quantifying the public health risk of existing properties is in progress. This includes identifying the number of new recycled water connections and repair works done in the last five years and assessing the risks based on the type of connections such as schools, hospitals, commercial, strata and single households. Controls include mains to meter checks. In February 2024, Sydney Water met with IPART and Fair Trading to discuss regulatory responsibility.	
2023-04	Recycled water Clause 4.2.3	By 30 June 2024, ensure stakeholder meetings are held at the required frequencies, especially those where an MoU has been developed (relates to Element 1).	New recommendation from the 2023 operational audit - On track The MoU between Sydney Water and NSW Fair Trading requires meetings to be held on a quarterly basis. Sydney Water is organising regular meetings as required by the MoU. The following meetings were held during 2023-24 YTD: • August 2023 • October 2023 • December 2023 • January 2024. Sydney Water is planning the next meeting for April 2024.	Auditor to check for completion
2023-05	Recycled water clause 4.2.3	By 30 June 2024, revise the risk assessment process to include a requirement to review the potential risk of overruns in the four yearly major risk assessment reviews. Overruns should be minimised, but where they are unavoidable the reasons for the delay should be documented, as well as the potential risk to Sydney Water in not thoroughly assessing the scheme within the four year period and an estimated date that the risk assessment will be undertaken (Element 2).	New recommendation from the 2023 operational audit - On track Risk assessments to be done in line with the Recycled Water Quality Management Plan review cycle. Document will be created for the 4 yearly review cycle, which will coincide with changes to the log reduction value (LRV) monitoring program. The business is considering the requirement to document reasons for delays (including the identification of potential risks and mitigations) in conducting risk assessments and the inclusion of this in procedure, as part of the overall review of the Recycled Water LRV monitoring program.	Auditor to check for completion.

2023-06	Recycled water clause 4.2.3	By 30 June 2024, ensure that the Recycled Water Risk Assessment Workshop Procedure is followed, and risk assessment briefing papers include the review of data for problems using trends and charts (Element 2).	New recommendation from the 2023 operational audit - On track Review of the Recycled Water Risk Assessment Workshop Procedure is currently underway and it will be updated in line with the next risk assessment workshops (Gerringong, Penrith and St Marys Advanced Water Treatment Plants).	Auditor to check for completion.
2023-07	Recycled water clause 4.2.3	By 31 December 2024, Remove the vegetation from the St Marys WRRF CCT. Review the maintenance planning process and prioritise maintenance for CCPs; ensure that the reason for any delays is recorded and assess the potential impacts on treatment performance (Element 3).	New recommendation from the 2023 operational audit - On track New Chlorine Contact Tank (CCT) is being commissioned by Major Projects which is expected to be completed by September 2024 (with risk contingency until November 2024). Sydney Water is also looking at alternate options (non preferred) related to the channel in operation. All of the alternate options which are being considered are only partially effective and have a range of different safety and process risks. The strong preference from a safety perspective is to have the tank drained to complete the activities. The path to go down any of the alternate options largely hinges on the success of the upstream dosing trial in coming weeks. All reliability operations maintenance (ROM) teams are reviewing their plans for managing vegetation in process units. This review requirement was targeted for completion by end of March 2024. At 14 March, over 50% of treatment facilities had been assessed with the remainder planned to be completed by the end of March 2024.	Auditor to check Sydney Water's progress against the recommendation.
2023-08	Recycled water clause 4.2.3	By 30 June 2024, ensure that all monitoring instruments, including handheld, are calibrated as required and appropriate records are maintained (Element 4).	New recommendation from the 2023 operational audit - On track	Auditor to check for completion.

			Action is being addressed from a water resource recovery (WRR) perspective, although St Marys will be the first to have the updated monitoring requirements implemented. Foundation work underway based on monitoring of critical control points (CCPs) instrumentation at Water Filtration sites.	
2023-09	Recycled water clause 4.2.3	By 30 June 2024, ensure that the management of incidents, including the completion of thorough investigations, is undertaken in a timely manner. Review incident management documentation with NSW Health to ensure a balance is struck between timelines and practicality, whilst managing risks to public health appropriately. In doing so, ensure that the agreed timelines are met for the notification, reporting and investigation of recycled water incidents (Element 6).	New recommendation from the 2023 operational audit - On track Refinement of policies in train, and resourcing requirements and timeframes for debrief and investigation to be augmented as a result of the review. Once the draft policies are finalised, NSW Health will be consulted (likely around June 2024).	Auditor to check for completion.
2023-10	Asset management clause 5.5.2	By 31 December 2024, Sydney Water must take action to ensure that its maintenance management processes, including the management of associated records, are fully embedded (understood and implemented) across the organisation. This should be demonstrated by (for example): evidence that focused training of relevant personnel has been undertaken; and/or records of internal audits across a representative sample of facilities and maintenance groups.	New recommendation from the 2023 operational audit - On track Maintenance processes have been implemented through Service Excellence. These include development of bottom up maintenance plan, integrated works plan and establishment of maintenance Birrang Miyas (governance forums) to measure and control the works. The current focus is on improving the maintenance management processes through these forums.	Auditor to check Sydney Water's progress against the recommendation.
2023-11	MoU with FRNSW clause 7.2.2	It is recommended that Sydney Water takes action to: a. Complete hydraulic model rebuilds and provide hydrant pressure information to FRNSW for at least six supply zones, as indicated in the *2023 24 - Water Network Model Rebuild (BAU) & FRNSW Model Pressure/Flows program,* by 30 June 2024. b. Complete hydraulic model rebuilds and provide hydrant pressure information to FRNSW for at least another six supply zones by 30 June 2025.	New recommendation from the 2023 operational audit – Delayed a. Hydraulic model rebuild is a complex exercise and requires specialised resources trained in hydraulic modelling. Sydney Water has completed the rebuilding of hydraulic models for two supply zones. The third zone (Prospect Elevated Zone) is half complete. Work has slowed due to unplanned resource changes. Current planned completion date of the remaining supply zones is 30 September 2024.	Auditor to check Sydney Water's progress against the recommendation.

		c. Agree with FRNSW, a timeline for provision of the remaining pressure information to FRNSW by 30 June 2025 (or other date agreed by IPART)	b. Sydney Water is exploring options and funding sources to build the modelling capability and complete the modelling of remaining zones. The proposed approaches being developed are targeting a resource model that will enable completion of another six supply zones by 30 June 2025, pending funding approval. c. Experience gained in the building of models up to 30 June 2025 will be used in partnership with FRNSW and Sydney Water's IPART submission personnel to propose a funding and resource model that will deliver the remaining pressure information to an agreed timeframe.	
2023-12	Recycled water clause 4.2.3	By 30 June 2024, move the St Marys Water Resource Recovery Facility (WRRF) filtration CCP turbidity meter to the outlet of the filters. (replaces Rec 2022-07).	New recommendation from the 2023 operational audit - On track Currently scoping out funding options for a new turbidity meter, or to relocate the existing turbidity meter at the St Marys WRRF. Agreement with NSW Health to ensure that schemes with filtered water turbidity as a critical control point (CCP) have turbidity meters measuring the combined filter outlet flow to verify the filter performance and ensure quality is adequate prior to disinfection. The development of the turbidity monitoring program hasn't been finalised with NSW Health at this point. Since the 2022-23 operational audit site visit to St Marys, a check has been undertaken on all sites, which identified that the same issue exists at three other sites (West Camden, Penrith and Quakers Hill). Funding approval has not been granted as yet to complete this work as OPEX.	Auditor to check for completion. (This recommendation replaces recommendation 2022-07 from the 2022 audit which was not completed but does not require re-audit.)

2022-03	Recycled water clause 4.2.1	By 30 June 2023, develop a procedure to track and respond to exceptions to the reservoir roof inspection program, including a process to prioritise delayed inspections and provide alternate inspection arrangements if reservoir roof access is unsafe. Appropriate alternative inspection arrangements and timeframes for implementation should be included in the procedure and agreed to by NSW Health. Performance reporting to NSW Health is to be reviewed as part of this action, including reporting against the Drinking Water Quality Specification reservoir inspection target (90% six monthly and three yearly inspections completed) and in addition reservoirs that have not been inspected for over 12 months should also be reported.	Recommendation from 2022 operational audit - Completed A thorough review of the reservoir inspection process was undertaken as part of the Service Excellence Accelerated Process Improvement (SEAPI) reservoir project. The recommendations of this project have been implemented, including updates to the inspection process, the tracking of inspections and alternative inspection processes. The updated inspection process and alternative inspection arrangements were provided to NSW Health and discussed at the Q4 Health JOG held in November 2023. Sydney Water has updated the Drinking Water Product Specification, with the six monthly inspection clarified as the roof integrity process relevant to drinking water quality. Whilst there is a 5 yearly reservoir (not 3 yearly) asset condition assessment, this inspection is focused on the reservoir asset condition, including corrosion, and not directly related to water quality. The Drinking Water Product Specification has been updated to reference the routine reservoir inspection program. NSW Health has reviewed the updates to the Product Specification. Sydney Water has advised NSW Health that the JOG quarterly water quality updates will include exception reporting for the reservoir roof inspection program, as part of the water quality hazard reporting processes.	Auditor to check for completion.

a Sydney Water is required to provide a report on progress by 31 March 2024 or a later date agreed by IPART. Due to the timing of the audit, the Tribunal has agreed to a later date of 31 May 2024 for Sydney Water to report on its progress with the audit recommendations

Source: IPART, *Report to the Minister - Sydney Water Corporation Operational audit 2020-21, February 2024*

Table 3 Previous field verification locations for Sydney Water's audits

Audit year	Location	Facility
2023	St Marys	Water Recycling Plant
	Prospect	Water Filtration Plant
	Rouse Hill	Water Reservoir
	Girraween	Maintenance Issue
2022	Richmond	Water Recycling Plant
	North Richmond	Water Filtration Plant
	South Windsor	Water Reservoir
	St Mary's	Maintenance Depot
2021	NA	Pipe repair
	Macarthur	Water Filtration Plant
	Liverpool	Water Recycling Plant
2020	Nepean	Water Filtration Plant
	West Camden	Water Recycling Plant
	Prospect	Water and sewer pump stations - maintenance
	Camellia	Sewer pump station - maintenance
2019	Oak Flats	Re-chlorination Plant
	Wollongong	Water Recycling Plant
	Helensburgh	Reservoir
	Woronora	Water Filtration Plant
2018	Cascade	Water Filtration Plant
	Parklea	Drinking and Recycled Water Reservoirs, and rechlorination station
	Rouse Hill	Water Recycling Plant and network
2017	Nepean	Water Filtration Plant
	Prospect	Water Filtration Plant
	Campbelltown	Reservoir
	Liverpool	Water Recycling Plant
	Guildford	Water main renewal - maintenance
2016	Orchard Hill	Water Filtration Plant
	Prestons	Maintenance Depot
	Cronulla	Wastewater Treatment Plant
2015	Parklea	Reservoir
	Box Hill	Pumping Station
	North Richmond	Water Filtration Plant

	Rouse Hill	Water Recycling Plant
2014	West Camden	Water Recycling Plant
	Warragamba	Water Filtration Plant
		South West Growth Area
2013	Macarthur	Water Filtration Plant
	Liverpool	Customer Service Centre
	Liverpool	Water Recycling Plant
	West Hoxton	Priority Sewage Project
2012	Wollongong	Water Recycling Plant
	Woronora	Water Filtration Plant
	Heathcote	Reservoir
2011	N/A	Three treated water reservoirs
	Orchard Hills	Water Filtration Plant
	Drummoyne	Mains flushing

E Auditor's report

Cobbitty Consulting
Engineering and Advisory Services

VIRIDIS CONSULTANTS

2024 Operational Audit of Sydney Water

Final Audit Report

#20047-10-001 Version 3.1

Independent Pricing and Regulatory Tribunal

January 2025

Document History

2024 Operational Audit of Sydney Water

Final Audit Report

Independent Pricing and Regulatory Tribunal

This document has been issued and amended as follows:

Version	Date	Description	Created by	Checked by	Approved by
1.0	15 November 2024	Draft	Jim Sly and James Howey	Karen Pither	Jim Sly
2.0	11 December 2024	Draft Final	Jim Sly and James Howey	-	Jim Sly
3.0	20 January 2025	Final	Jim Sly and James Howey	Karen Pither	Jim Sly
3.1	22 January 2025	Final (updated)	Jim Sly	-	Jim Sly

Cobbitty Consulting Pty Ltd
ABN: 45 164 692 488

14 Cobbitty Court, Boronia VIC 3155
Telephone: +61 (0) 423 326 693
Email: jim.sly@cobbittyconsulting.com.au

Contents

Glossary

Acronym/Term	Description
ADWG	*Australian Drinking Water Guidelines*
AGS	Aerobic Granular Sludge technology (wastewater treatment process)
AMS	Asset Management System
AGWR	*Australian Guidelines for Water Recycling*
AWTP	Advanced Water Treatment Plant
BI	Business Intelligence (*typically refers to the data management system used by Sydney Water*)
BM	Breakdown Maintenance (*type of maintenance activity*)
BMIS	Business Management Information System (*Records management system*)
BOO	Build-Own-Operate (*a project delivery partnership model used by Sydney Water in respect of some treatment plants*)
BOOT	Build-Own-Operate-Transfer (*a project delivery partnership model used by Sydney Water in respect of some treatment plants*)
C2C	Catchment to Customer (*relates to the scope of risk assessments*)
CAG	Condition Assessment Grade (*score assigned to assets*)
Camms	Organisation-wide Governance, Risk, Compliance, Safety, Health, Environment, Quality (GRCSHEQ) application used by Sydney Water
CAR	Compliance Accountability Register
CAP	Consolidated Action Plan
CCP	Critical Control Point
CCT	Chlorine Contact Tank
CoF	Consequence of Failure (*score assigned to assets, processes and subprocesses*).
CM	Corrective Maintenance
CRM	Customer Relationship Management system
CWT	Clear Water Tank
DPE	NSW Department of Planning and Environment
DWQEMP	Drinking Water Quality Event Management Plan
DWQMP	Drinking Water Quality Management Plan
DWQMS	Drinking Water Quality Management System
EPA	Environment Protection Authority
EPL	Environment Protection Licence
FFWG	Fire Fighting Working Group
FRNSW	Fire and Rescue NSW
GIS	Geographical Information System
HBT	Health-based Target
HYDRA/Hydra	Enterprise Geographical Information System (GIS) used by Sydney Water
IICATS	Integrated Instrumentation, Control, Automation and Telemetry System
IDAL	Intermittently Decanted Aerated Lagoons (wastewater treatment process)
IMP	Incident Management Plan

Acronym/Term	Description
IPART	The Independent Pricing and Regulatory Tribunal (NSW)
JOG	Joint Operational Group
LRV	Log Reduction Value
KPI	Key Performance Indicator
Maximo	Enterprise Computerised Asset/Maintenance Management System used by Sydney Water
MoU	Memorandum of Understanding
MPM	Major Periodic Maintenance
NPR	National Performance Reporting (relates to performance benchmarking indicators initiated under the (then) National Water Initiative (NWI))
NSW Health	Secretary of the Ministry of Health
OFI	Opportunity for Improvement
OL	*Sydney Water Operating Licence 2019-2023*, the term of which was extended to 30 June 2024
PFAS	Per- and polyfluoroalkyl substances
PFD	Process Flow Diagram
PLC	Programmable Logic Controller
PM	Programmed Maintenance (*type of maintenance activity*)
PO	Production Officer
Power BI	Microsoft Power BI is an interactive data visualisation software product with a primary focus on business intelligence, used by Sydney Water
PRW	Purified Recycled Water
REC	Recommendation
ROM	Reliability Operation and Maintenance (*group within Sydney Water*)
ROMP	Reliability, Operations, Maintenance and Process
ROV	Remotely Operated Vehicle (*used for underwater internal inspection of reservoirs*)
RPZ	Reduced pressure zone (*relates to device for backflow prevention*)
RWQMP	Recycled Water Quality Management Plan
RWQMS	Recycled Water Quality Management System
SCADA	Supervisory Control and Data Acquisition
SITREP	Situation Report
SLG	Strategic Liaison Group
SOP	Standard Operating Procedure
SWIM	Sydney Water Information Management (*Records management system*)
SWIRL	Sydney Water Incident Recording and Learnings
TIBCO	Application used by Sydney Water to manage its renewals program
THM	Trihalomethane
WFP	Water Filtration Plant
WRP[1]	Water Recycling Plant
WRRF[1]	Water Resource Recovery Facility

[1] The terms 'Water Resource Recovery Facility' and 'Water Recycling Plant' are both used in respect of facilities that produce recycled water from wastewater.

Executive Summary

Auditor Declaration

This report presents the findings of an Operational Audit of Sydney Water's compliance with the requirements of its Operating Licence during the period 1 July 2023 to 30 June 2024. The audit was undertaken by Cobbitty Consulting, in association with Viridis Consultants, for the Independent Pricing and Regulatory Tribunal (IPART).

The audit team confirms that:

- the auditors have seen sufficient evidence on which to base their conclusions;
- the audit findings accurately reflect the professional opinion of the auditors;
- the lead auditor and team members have conducted the audit, determined audit findings and prepared this report in accordance with the requirements of the *Audit Guideline – Public Water Utilities*[2] and IPART's *Contract Proposal*.[3]
- the audit findings have not been unduly influenced by the utility and/or any of its associates.

Major Findings

The audit team found that Sydney Water had performed well against the audited obligations over the audit period. Twelve (12) clauses of the Operating Licence were audited, the findings in respect of which can be summarised as follows:

- It was found that there was no requirement for compliance in respect of one (1) of the audited clauses during the audit period;
- Non-compliant (non-material) has been assigned in respect of one (1) clause;
- Compliant (minor shortcomings) has been assigned in respect of two (2) clauses; and
- Compliant has been awarded to the remaining eight (8) audited clauses.

The identified non-compliance relates to compliance with the Fluoridation Code. The minor shortcomings relate to implementation of the Drinking Water Quality Management System and Recycled Water Quality Management System.

The findings of the audit of performance against the audited Licence obligations are summarised in **Table E.1**.

The assessment of progress in respect of previous audit recommendations is summarised in **Table E.2**. One (1) of the thirteen (13) recommendations remains ongoing; the remaining twelve (12) have been effectively addressed.

[2] IPART, *Public Water Utility Audit Guideline (Guideline – Water)*, July 2023.
[3] IPART, *Contract Proposal* (Contract Proposal No: Cobbitty_2024_01) in respect of the *Scope of Work: 2024 Public Water Utility Audits* (Documents: *PART A - Scope of Work and COBBITTY Standing Offer Arrangement Framework Annexures C and D.pdf* and *PART A - Scope of Work attachments.pdf*) as issued via email correspondence on 14 June 2024.

Six (6) recommendations (set out in **Table E.3**) have been made to address the reported non-compliances and minor shortcomings. Thirty (30) opportunities for improvement (refer **Table E.4**) have been identified for consideration by Sydney Water.

Table E.1 Summary of Audit Findings

Licence Part	Sub-clause /Obligation	Compliance Grade/Comment[4]
4. Performance Standards for Water Quality		
4.1 Drinking Water	4.1.3	Compliant (minor shortcomings) Refer 2.2.1.1 *Sydney Water demonstrated that, in most respects it had effectively implemented its Drinking Water Quality Management System during the audit period; however, the following minor shortcomings were identified:* ▪ *backflow prevention program is being undertaken; however, a shortcoming is identified due to the low compliance against the target in the Drinking Water Product Specification (relates to Element 3);* ▪ *monitoring for the primary disinfection CCP at Cascade is not in accordance with the Drinking Water Product Specification (Element 3); and* ▪ *update of the document control tables in procedures has not been undertaken in accordance with Controlled Document Standard (Element 10).* Recommendations **REC-SWC-2024-01, 02 & 03** (refer Table E.3 for details) are made.
4.2 Recycled Water	4.2.3	Compliant (minor shortcomings) Refer 2.2.2.1 *Sydney Water demonstrated that, in most respects, it had effectively implemented its Recycled Water Quality Management System during the audit period; however, there was a minor shorcoming in that some some scheduled calibrations for CCP monitoring instruments were not undertaken (relates to Element 4). This issue was identified by the 2022/23 Operational Audit, but was not fully addressed until the end of the current audit period.* No recommendation is made as the issue has now been addressed in response to Previous Recommendation 2023-08 (refer section 3.2.2.6).
4.3 Fluoridation Code	4.3.1	Non-compliant (non-material) Refer section 2.2.3.1 *The fluoride dosing installation at the Cascade WFP is not fully compliant with the requirements of the Fluoridation Code in that:* ▪ *a particular mode of manual fluoride dosing pump operation that did not have a time constraint was available to operators;* ▪ *the fluoride room fan appears to be inadequate to effectively manage fumes and is not acid proof; and* ▪ *the capacity of the fluoride day tanks excessive.* Recommendations **REC-SWC-2024-04, 05 & 06** (refer Table E.3 for details) are made.

[4] Comment provided where shortcomings were identified, or non-compliance was assessed.

Licence Part		Sub-clause /Obligation	Compliance Grade/Comment[4]
5.	**Performance Standards for Service Interruptions**		
5.1	Water Continuity Standard	5.1.1	Compliant Refer section 2.3.1.1
		5.1.4	Compliant Refer section 2.3.1.2
5.2	Water Pressure Standard	5.2.1	Compliant Refer section 2.3.2.1
5.3	Dry Weather Wastewater Overflow Standard	5.3.1	Compliant Refer section 2.3.3.1
5.5	Asset Management	5.5.2	Compliant Refer section 2.3.4.1
8.	**Information and Services for Competitors**		
8.1	Negotiations with WIC Act licensees and Potential Competitors	8.1.1	Compliant Refer section 2.4.1.1
8.3	Code of Conduct	8.3.1	No requirement Refer section 2.4.2.1
10.	**Performance Monitoring and Reporting**		
10.2	Reporting	10.2.2	Compliant Refer section 2.5.1.1
		10.2.3	Compliant Refer section 2.5.1.2

Table E.2 Summary of Assessed Progress in Respect of Previous Audit Recommendations

Recommendation[5]	Licence Reference[6] and Operational Issue	Status/Comment[7]
2022-03	*Drinking Water (clause 4.1.3)*	Completed Refer section 3.2.1.1
2023-01	*Drinking Water (clause 4.1.3)*	Completed Refer section 3.2.1.2
2023-02	*Drinking Water (clause 4.1.3)*	Completed Refer section 3.2.1.3
2023-03	*Recycled Water (clause 4.2.1)*	Ongoing; part a) completed; part b) anticipated to be completed by 30 June 2025 (beyond the target date). Refer section 3.2.2.1
2023-04	*Recycled Water (clause 4.2.3)*	Completed Refer section 3.2.2.2
2023-05	*Recycled Water (clause 4.2.3)*	Completed Refer section 3.2.2.3
2023-06	*Recycled Water (clause 4.2.3)*	Completed Refer section 3.2.2.4
2023-07	*Recycled Water (clause 4.2.3)*	Completed Refer section 3.2.2.5
2023-08	*Recycled Water (clause 4.2.3)*	Completed Refer section 3.2.2.6
2023-09	*Recycled Water (clause 4.2.3)*	Completed Refer section 3.2.2.7
2023-12	*Recycled Water (clause 4.2.3)*	Completed Refer section 3.2.2.8
2023-10	*Asset management (clause 5.5.2)*	Completed Refer section 3.2.3.1
2023-11	*Memorandum of Understanding with FRNSW (clause 7.2.2)*	Completed Refer section 3.2.4.1

[5] Recommendations are listed in order by the applicable *Operating Licence* clause, and then numerically.
[6] Refer to the relevant section of this report and associated appendix for full details of previous recommendations.
[7] Comment provided where recommendation has not been fully addressed (i.e. completed).

Recommendations

Recommendations arising from the audit are presented in **Table E.3**.

Table E.3 Audit Recommendations

Licence Part	Clause /Obligation	Recommendation
4. Performance Standards for Water Quality	4.1.3	▪ **REC-SWC-2024-01:** By 30 June 2025, review the implementation of the backflow prevention program, including target criteria and enforceable actions which could be taken to improve compliance (relates to Element 3). ▪ **REC-SWC-2024-02:** By 30 June 2025, review the location and implementation of the monitoring for the primary disinfection CCP at Cascade WFP in accordance with the *Drinking Water Product Specification* (which is free chlorine and should be monitored at the WFP reservoir outlet before the first customer). In addition, review and update the Cascade WFP process flow diagram and Cascade WFP Process Specification documentation accordingly based on the review findings (Element 3). ▪ **REC-SWC-2024-03:** By 30 June 2025, take action to ensure that the document control information is updated in the version history table of documents and procedures when they are reviewed or updated, in line with the requirements of the *Controlled Documents Procedure* and *Controlled Documents Standard* (Element 10).
	4.3.1	▪ **REC-SWC-2024-04:** By 30 June 2025, ensure that fluoride dosing pumps cannot be left in manual operation for greater than 5 minutes. Check all fluoride dosing plants to ensure that the arbiter manual function has been disabled, other manual modes in SCADA/PLC time out after 5 minutes and that any manual mode at the device level requires continuous operator intervention to operate. ▪ **REC-SWC-2024-05:** By 30 June 2025, evaluate if the fans installed in fluoride rooms and ensure they are acid resistant and have the capacity to protect equipment from fumes and provide a safe working environment. ▪ **REC-SWC-2024-06:** The capacity of fluoride day tanks should not exceed the volume of chemical required for 36 hours of fluoride dosing to the target dose at maximum plant flow. By 30 June 2025, ensure that the capacity of day tanks at all WFPs are not in excess of this volume and cannot be adjusted to exceed it.

Opportunities for Improvement

Opportunities for improvement arising from the audit are presented in **Table E.4**.

Table E.4 Identified Opportunities for Improvement

Licence Part	Clause /Obligation	Opportunities for Improvement
4. Performance Standards for Water Quality	4.1.3	▪ **OFI-SWC-2024-01:** Update the process flow diagram for Cascade WFP to show that there are some customers off the rising main prior to the Catalina reservoir. Apply this to all other process flow diagrams as relevant (relates to Element 2). ▪ **OFI-SWC-2024-02:** Develop a detailed contingency plan for pre-treatment at Warragamba WFP, which includes mobilisation triggers, availability arrangements with suppliers, commissioning timeframes, validation requirements, and the need for consultation with NSW Health and other stakeholders (Element 3). ▪ **OFI-SWC-2024-03:** Review the *Drinking Water Quality Event Management Plan* in relation to events and incident triggers. Ensure that it is clear when incident debriefs require NSW Health to be present for all issues including evidence of vermin found in reservoirs. Appropriate records must be kept of debriefs to demonstrate procedures are being followed (Element 6). ▪ **OFI-SWC-2024-04:** Maintain water quality awareness training records for staff who undertake audits on network repair works (Element 7). ▪ **OFI-SWC-2024-05:** Discuss with Water Brothers regarding inclusion of the water quality training package delivered by Sydney Water into their internal induction program (Element 7). ▪ **OFI-SWC-2024-06:** Ensure that document management training (including document creation, reviews and updates) is included as a Compass training module for Production Officers (Element 10).
	4.2.3	▪ **OFI-SWC-2024-07:** Ensure that all records for RWQMP risk assessments are appropriately retained (relates to Element 2). ▪ **OFI-SWC-2024-08:** Review the General Network Risk Assessment (Risk ID: 54596) and consider what controls can be implemented or influenced by Sydney Water to manage the consequences of a cross-connection on private property, on the occupants of that property (Element 3). ▪ **OFI-SWC-2024-09:** Add the functionality to SCADA that allows Production Officers to collate interlocks based on CCP triggers to allow them to be reviewed and considered in meetings and risk assessments (Element 3). ▪ **OFI-SWC-2024-10:** Review how the management of bulk chemicals can be improved so that batches can be traced through the quality assurance process (Element 4).

Licence Part	Clause /Obligation	Opportunities for Improvement
		▪ **OFI-SWC-2024-11:** Ensure that all incident management procedures are updated to reflect the implementation of Camms (Element 6). ▪ **OFI-SWC-2024-12:** Use a single platform/process to track training and training requirements consistently across the business (Element 7).
	4.2.3 (Rec. 2023-05)	▪ **OFI-SWC-2024-30:** In the *Recycled Water Risk Assessment Workshop Procedure* state that the risk of delays to the risk assessment schedule must be documented. This should consider things such as process or procedural change; if there had been a number of changes, there may be a higher risk to the delay than if activities are consistent with the last time the risk assessment was undertaken.
	4.3.1	▪ **OFI-SWC-2024-13:** Reduce the range of the fluoride concentrations achieved in the drinking water to be ± 5% of 1.00 mg/L. ▪ **OFI-SWC-2024-14:** Clearly identify the source of the start/stop signals for the fluoride plant in the Functional Design Specification. The instruments should be in the Section 21.1 Equipment List and in Section 21.8 Interlocks. ▪ **OFI-SWC-2024-15:** Calculate the maximum capacity of fluoride dosing at all plants using the operational setpoint rather than the prescribed dose. If any dosing systems have a capacity of greater than 110% of the operational target dose at maximum plant flowrate, consideration should be given to restricting capacity. ▪ **OFI-SWC-2024-16:** Reduce fluoride online meter SIM mode timeout to 5 minutes at all plants. If a higher time period is required, this should be discussed with NSW Health. ▪ **OFI-SWC-2024-17:** Provide an HMI externally to the room, within sight of the plant. ▪ **OFI-SWC-2024-18:** Remove electrical control boxes and equipment such as flow meter control boxes from inside fluoride rooms. ▪ **OFI-SWC-2024-19:** Place a sign at the entrance to the Fluoride Rooms identifying the PPE required to enter. ▪ **OFI-SWC-2024-20:** Epoxy coat any areas in the Fluoride Room that may be splashed with hydrofluosilicic acid and the tanker unloading area. ▪ **OFI-SWC-2024-21:** Adjust the amount of fluoride transferred to Day Tanks based on demand. This will reduce the risk of an overdose event. ▪ **OFI-SWC-2024-22:** Investigate if there is a possibility of moving the fluoride dosing point and/or monitoring point so that monitoring is representative of the real-time fluoride dosing performance and not buffered by the Clear Water Tank at Cascade WFP. ▪ **OFI-SWC-2024-23:** Gain written approval from NSW Health regarding sending a monthly duplicate to the NSW Forensic and Analytical Science Service for comparison.

Licence Part	Clause /Obligation	Opportunities for Improvement
		▪ **OFI-SWC-2024-24:** Undertake a review of WFPs that fluoridate and plan how a fluoride overdose would be isolated and flushed or diluted to bring levels down to the target level. Include strategies for each plant in the *Drinking Water Quality Event Management Plan*. ▪ **OFI-SWC-2024-25:** Make a record of contact with NSW Health of events and incidents. Consider recording who made the call, who was spoken to, the date and time and what was discussed. ▪ **OFI-SWC-2024-26:** Enter monthly fluoride data reported to the NSW Health into the Water Database. Otherwise, seek an exemption to supply it electronically. ▪ **OFI-SWC-2024-27:** Ensure the SITREP form includes all of the required information to notify and create a reliable record of the incident. This would include details of notifications to external agencies.
5. Performance Standards for Service Interruptions	5.1.1	▪ **OFI-SWC-2024-28:** Take action to ensure that the version number, as well as issue date, is updated for each revision of a controlled document (for example, for the *Performance Indicator Sheet – Water Continuity Standard* updated on 24 September 2024).
	5.2.1	▪ **OFI-SWC-2024-29:** Review and, if deemed beneficial, rationalise procedural documentation related to the Water Pressure Standard (may also be considered for other performance standard procedural documentation).

1. Introduction

1.1 Objectives

The objective of this audit was to assess, for the period from 1 July 2023 to 30 June 2024, Sydney Water's performance against the terms and conditions (obligations) of:

- the *Sydney Water Operating Licence 2019-2023* (Operating Licence); and
- any other Ministerially-imposed requirements.

1.2 Audit Method

1.2.1 Audit Scope

The scope of the 2024 Operational Audit of Sydney Water is specified in detail in IPART's *Contract Proposal*;[8] it comprised:

- audit of Sydney Water's compliance with the obligations and requirements set out in its *Operating Licence*;[9] and
- assessment of Sydney Water's progress in addressing outstanding recommendations arising from previous audits.

As outlined in its *Public Water Utility Audit Guideline*,[10] IPART adopts a risk-based approach in setting the scope of public water utility operational audits. The clauses/obligations against which Sydney Water's compliance has been assessed are identified in **Table 1.1**. Full details of the audit scope, as defined by IPART, are presented in **Appendix A**.

Table 1.1 Scope of 2024 Operational Audit of Sydney Water

Licence Part	Sub-clause/Obligation
4 Performance Standards for Water Quality:	
4.1 Drinking Water	4.1.3
4.2 Recycled Water	4.2.3
4.3 Fluoridation Code	4.3.1
5 Performance Standards for Service Interruptions:	
5.1 Water Continuity Standard	5.1.1; 5.1.4
5.2 Water Pressure Standard	5.2.1
5.3 Dry Weather Wastewater Overflow Standard	5.3.1
5.5 Asset management	5.5.2
8 Information and Services for Competitors:	
8.1 Negotiations with WIC Act licensees and Potential Competitors	8.1.1
8.3 Code of Conduct	8.3.1
10 Performance Monitoring and Reporting:	
10.2 Reporting	10.2.2(a) to (e); 10.2.3

[8] IPART, *Contract Proposal* (Contract Proposal No: Cobbitty_2024_01) in respect of the *Scope of Work: 2024 Public Water Utility Audits* (Document: *PART A - Scope of Work and COBBITTY Standing Offer Arrangement Framework Annexures C and D.pdf* and associated *PART A - Scope of Work attachments.pdf*), as issued via email correspondence on 14 June 2024.
[9] Refer to **Section 1.3** for details of the regulatory regime under which Sydney Water operates, including its *Operating Licence*.
[10] IPART, *Public Water Utility Audit Guideline (Guideline – Water)*, July 2023.

Sydney Water's progress in addressing recommendations from previous audits was also considered as part of the audit. Those recommendations are identified in **Table 1.2**.

Table 1.2 Recommendations/Outstanding Items from Previous Audits included in the Audit Scope

Recommendation[11]	Licence Reference[12] and Operational Issue
2022-03	*Drinking Water (clause 4.1.3):* By 30 June 2023, develop a procedure to track and respond to exceptions to the reservoir roof inspection program, including a process to prioritise delayed inspections and provide alternate inspection arrangements if reservoir roof access is unsafe. Appropriate alternative inspection arrangements and timeframes for implementation should be included in the procedure and agreed to by NSW Health. Performance reporting to NSW Health is to be reviewed as part of this action, including reporting against the Drinking Water Quality Specification reservoir inspection target (90% of six monthly and three yearly inspections being completed annually) and in addition reservoirs that have not been inspected for over 12 months should also be reported.
2023-01	*Drinking Water (clause 4.1.3):* By 31 December 2024, Sydney Water is to ensure that there is a process in place to provide contractors performing network repairs with adequate training to undertake works to the specified hygienic requirements and protect water quality (e.g. hygienic storage and repairs, adequate flushing, testing etc). In addition, a process must be in place to verify that these practices are being implemented by contractors (relates to Element 3).
2023-02	*Drinking Water (clause 4.1.3):* By 31 December 2024, review implementation of the process for closing incidents and undertaking incident debriefs (internal and multi-agency) as per Sydney Water's Incident Management Procedure and Incident Debrief and Investigation Procedure and undertake an awareness session with all relevant staff to enable the procedures to be fully implemented (Element 6).
2023-03	*Recycled Water (clause 4.2.1):* a) By 31 December 2024, Sydney Water must amend its existing process for connecting properties to the recycled water network to ensure that avoidable cross-connections are eliminated. b) By 31 December 2024, Sydney Water should also quantify the public health risk of existing properties and put appropriate controls in place, which may include the auditing of existing connections. This review must be undertaken in collaboration with NSW Health and the Department of Fair Trading. (Relates to Element 3).
2023-04	*Recycled Water (clause 4.2.3):* By 30 June 2024, ensure stakeholder meetings are held at the required frequencies, especially those where an MoU has been developed (relates to Element 1).
2023-05	*Recycled Water (clause 4.2.3):* By 30 June 2024, revise the risk assessment process to include a requirement to review the potential risk of overruns in the four yearly major risk assessment reviews. Overruns should be minimised, but where they are unavoidable the reasons for the delay should be documented, as well as the potential risk to Sydney Water in not thoroughly assessing the scheme within the four-year period and an estimated date that the risk assessment will be undertaken (Element 2).
2023-06	*Recycled Water (clause 4.2.3):* By 30 June 2024, ensure that the Recycled Water Risk Assessment Workshop Procedure is followed, and risk assessment briefing papers include the review of data for problems using trends and charts (Element 2).
2023-07	*Recycled Water (clause 4.2.3):* By 31 December 2024, remove the vegetation from the St Marys WRRF CCT. Review the maintenance planning process and prioritise maintenance for CCPs; ensure that the reason for any delays is recorded and assess the potential impacts on treatment performance (Element 3).

[11] Recommendations are listed in order by the applicable *Operating Licence* clause, and then numerically.
[12] Refer to the relevant section of this report and associated appendix for full details of previous recommendations.

Recommendation[11]	Licence Reference[12] and Operational Issue
2023-08	*Recycled Water (clause 4.2.3):* By 30 June 2024, ensure that all monitoring instruments, including handheld, are calibrated as required and appropriate records are maintained (Element 4).
2023-09	*Recycled Water (clause 4.2.3):* By 30 June 2024, ensure that the management of incidents, including the completion of thorough investigations, is undertaken in a timely manner. Review incident management documentation with NSW Health to ensure a balance is struck between timelines and practicality, whilst managing risks to public health appropriately. In doing so, ensure that the agreed timelines are met for the notification, reporting and investigation of recycled water incidents (Element 6).
2023-12	*Recycled Water (clause 4.2.3):* By 30 June 2024, move the St Marys Water Resource Recovery Facility (WRRF) filtration CCP turbidity meter to the outlet of the filters (replaces Rec 2022-07).
2023-10	*Asset management (clause 5.5.2):* By 31 December 2024, Sydney Water must take action to ensure that its maintenance management processes, including the management of associated records, are fully embedded (understood and implemented) across the organisation. This should be demonstrated by (for example): evidence that focused training of relevant personnel has been undertaken; and/or records of internal audits across a representative sample of facilities and maintenance groups.
2023-11	*Memorandum of Understanding with FRNSW (clause 7.2.2):* It is recommended that Sydney Water takes action to: a) Complete hydraulic model rebuilds and provide hydrant pressure information to FRNSW for at least six supply zones, as indicated in the 2023 24 - Water Network Model Rebuild (BAU) & FRNSW Model Pressure/Flows program, by 30 June 2024. b) Complete hydraulic model rebuilds and provide hydrant pressure information to FRNSW for at least another six supply zones by 30 June 2025. c) Agree with FRNSW, a timeline for provision of the remaining pressure information to FRNSW by 30 June 2025 (or other date agreed by IPART).

1.2.2 Audit Standard

The auditing principles/guidance presented in ISO 19011:2018 *Guidelines for auditing management systems* have been applied in conducting this audit. Guidance presented in the following standards was also considered where appropriate:

- ASAE 3100 (2008) *Compliance Engagements*;
- Auditing and Assurance Standard AUS 110 *Assurance Engagements other than Audits or Reviews of Historical Financial Information;* and
- International Standard on Quality Control ISQC 2009.

1.2.3 Audit Steps

The audit was undertaken in accordance with the methodology outlined in IPART's *Public Water Utility Audit Guideline*.[13] The audit steps are identified in **Table 1.3**.

[13] IPART, *Public Water Utility Audit Guideline (Guideline – Water)*, July 2023.

Table 1.3 Audit Steps[14]

Step	Description	Responsibility
Step 1	Audit kick-off meeting	IPART (Auditor/Utility participate)
Step 2	A – Preparation of audit questionnaire B – Response to questionnaire/provision of evidence	Auditor Utility
Step 3	Audit interviews and Field verification site visits	Auditor/Utility (IPART observe)
Step 4	A – Provision of Summary of Audit Findings Report B – Preliminary findings meeting C – Provision of Draft Audit Report D – Provision of Final Audit Report	Auditor IPART (Auditor/Utility participate) Auditor Auditor
Step 5	Audit close out meeting	IPART (Auditor/Utility participate)

Audit interviews and field verification site visits were undertaken during the three (3) day period 17 September 2024 to 19 September 2024. Interviews were conducted with Sydney Water representatives at Sydney Water's Parramatta offices. Field verification site visits were made to:

- Cascade Water Filtration Plant (WT 0041);
- Faulconbridge Reservoir (WS 0382) and Pumping Station (WP 0268);
- Quakers Hill Water Resource Recovery Facility (ST 0018); and
- Stonecutters Ridge Golf Course recycled water supply point.

An overview in respect of the field verification visits/briefing sessions is presented in **Appendix B**.

1.2.4 Audit Team

The audit team comprised of the following:

- Jim Sly – team lead and Lead Auditor;
- James Howey – Lead Auditor;
- Mark Fevatta –Auditor providing audit support
- Tasleem Hasan – Lead Auditor providing audit support.

The allocation of responsibility for the various components of the audit (clauses audited by each auditor) was as nominated in **Table 1.4**.

[14] IPART, *Public Water Utility Audit Guideline (Guideline – Water)*, July 2023, section 2.3 and figure 2.1.

Table 1.4 Allocation of Audit Responsibilities

Licence Part	Clause/Obligation	Lead Auditor
Operating Licence:		
4 Performance Standards for Water Quality:		
4.1 Drinking Water	4.1.3	James Howey
4.2 Recycled Water	4.2.3	James Howey
4.3 Fluoridation Code	4.3.1	James Howey
5 Performance Standards for Service Interruptions:		
5.1 Water Continuity Standard		
5.2 Water Pressure Standard	5.1.1; 5.1.4	Jim Sly
5.3 Dry Weather Wastewater Overflow Standard	5.2.1	Jim Sly
5.5 Asset management	5.3.1	Jim Sly
	5.5.2	Jim Sly
8 Information and Services for Competitors:		
8.1 Negotiations with WIC Act licensees and Potential Competitors	8.1.1	Jim Sly
8.3 Code of Conduct	8.3.1	Jim Sly
10 Performance Monitoring and Reporting		
10.2 Reporting	10.2.2(a) to (e); 10.2.3	Jim Sly
Recommendations/Outstanding Items from Previous Audits:		
4.1 Drinking Water	2022-03 2023-01, 02	James Howey
4.2 Recycled Water	2023-03, 04, 05, 06, 07, 08, 09 & 12	James Howey
5.5 Asset management	2023-10	Jim Sly
7.2 Memorandum of Understanding with FRNSW	2023-11	Jim Sly
NPR Indicators:		
NPR Indicators: – Assets – Environment – Public Health	Indicators as reported by Sydney Water	Jim Sly

IPART representatives Mamata Titus, Shweta Shrestha and Nahrain Oshana attended throughout the audit as observers. A list of Sydney Water representatives that attended audit interviews and/or field verification presentations is provided in **Appendix D**; Sydney Water's Audit Coordination Team members Sandra Spargo, Gus Garbers, Jignesh Chudasama and Bibiana Agudelo attended throughout the audit.

1.2.5 Audit Grades

Audit grades have been awarded in accordance with the guidance presented in the *Audit Guideline – Public Water Utilities*. The compliance grades used in this report are as identified in **Table 1.5**.

Table 1.5 Compliance Grades for Public Utilities[15]

Grades of compliance	Description
Compliant	The auditor has established compliance and identified no shortcomings.
Compliant (minor shortcomings)	The auditor has established compliance but has identified **minor shortcomings** that must be addressed. Minor shortcomings are unlikely to have an impact on the Public Water Utility meeting the objectives of the licence obligation.
Non-compliant (non-material)	The auditor has established non-compliance and has identified **inconsistencies, inadequacies or deficiencies that pose a low or non-material risk** to the Public Water Utility meeting the objectives of the licence obligation.
Non-compliant (material)	The auditor has established non-compliance and has identified **inconsistencies, inadequacies or deficiencies that pose a high or material risk** to the Public Water Utility meeting the objectives of the licence obligation.
No Requirement	There was no requirement for the Public Water Utility to comply with the licence obligation during the audit period.

1.3 Regulatory Regime

Sydney Water Corporation is constituted under the *Sydney Water Act 1994* and is a statutory State-owned corporation pursuant to the *State Owned Corporations Act 1989*. It supplies water, wastewater, recycled water and some stormwater services to over 4.6 million people in Sydney, the Illawarra and the Blue Mountains.

Pursuant to Section 12 of the *Sydney Water Act 1994*, Sydney Water can be granted one or more operating licences to authorise it to carry out its specified and other functions. For the purposes of this audit (which addresses the audit period 1 July 2023 to 30 June 2024), Sydney Water has been granted and has been operating under the provisions of the *Sydney Water Operating Licence 2019-2023*, the term of which was extended to 30 June 2024.

1.4 Quality Assurance Process

The quality assurance processes implemented in undertaking this audit have included:

- Peer review of the audit questionnaires prior to submission to IPART;
- Processes to control all documents used in the audit;
- Accuracy checks of reported data and the completeness of audit trails;
- Peer review of preliminary findings and audit assessments included in the Draft Reports;
- Quality review of the Draft Reports (both independently and by the Audit Team Leader);

[15] IPART, *Public Water Utility Audit Guideline (Guideline – Water), July 2023*, figure 2.1.

- Peer review of the Revised Draft Reports, specifically the treatment of comments received on the Draft Report and the feasibility of recommendations and opportunities for continuous improvement; and
- Quality review of the Final Report (both independently and by the Audit Team Leader).

An independent peer review has been undertaken to ensure that the accuracy of each section of the report is checked through quality control steps and all audit judgements, conclusions and recommendations are validated. The independent review was by Karen Pither, who holds Exemplar Global lead auditor accreditation in respect of Drinking Water and Recycled Water Quality Management Systems.

As Audit Team Leader, Jim Sly has reviewed all aspects of the Audit Report prior to release.

2. Detailed Audit Findings

2.1 Overview

This section sets out the detailed findings of the audit for each audited clause of the *Operating Licence*. In each case the following is provided:

- the Licence requirement is defined;
- the risk that non-compliance with the requirement presents;
- the assessed level of compliance (compliance grade);
- a summary of the reason for the assessed compliance grade;
- a list of the evidence reviewed in assessing compliance;
- discussion of the evidence reviewed and how it demonstrates/supports the assessed level of compliance;
- any recommendations (in the event that full compliance is not assessed); and
- any identified opportunities for improvement.

A list of the evidence reviewed in assessing compliance for each clause is presented in **Appendix C**.

2.2 Performance Standards for Water Quality (Licence Part 4)

2.2.1 Drinking Water (clause 4.1)

2.2.1.1 Drinking Water – Implementation of DWQMS (sub-clause 4.1.3)

Sub-clause	Requirement	Compliance Grade
4.1.3	Sydney 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. [*Note: Sydney Water is to apply the Drinking Water Quality Management System to the Drinking Water system under its control, having regard to the entire Drinking Water supply system – from the water catchment to the Consumer.*]	 **Compliant (minor shortcomings)**

Risk if non-compliant

If the Drinking Water Quality Management System is not fully implemented, there is a high risk that Sydney Water may not be able to effectively manage risks to drinking water quality and protect public health.

Evidence sighted

Refer Appendix C (C.2.1).

Summary of audit findings/reasons for grade

Sydney Water has largely implemented its Drinking Water Quality Management System. Minor shortcomings were noted for Element 3 (preventative measures for drinking water quality management). These were considered minor and did not affect Sydney Water's ability to supply safe drinking water during the audit period. Sydney Water has a multiple barrier approach to drinking water safety and a shortcoming in one barrier does not necessarily result in an unsatisfactory risk to the consumer.

The backflow prevention program is being implemented; however, a minor shortcoming is identified due to the low compliance against the target in the *Drinking Water Product Specification*. Backflow prevention devices protect the drinking water network from contamination due to reverse flow from a property. The requirement for a backflow prevention device is specified under the *Plumbing Code of Australia*, which aligns with AS/NZS 3500.1: *Plumbing and Drainage Part 1 – Water Services*. A backflow prevention device is required to be tested annually for medium and high-risk installations. Sydney Water must maintain a register of medium and high-risk devices and property owners are required to test them. A failed backflow prevention device, which the testing program would identify, may result in contamination of the drinking water supply due to reverse flow from a property. The risk to the network increases as compliance with the testing requirement reduces; some devices may not be tested for an extended period.

The annual backflow testing compliance status (proportion of required tests completed) for the Cascade scheme area was approximately 70% and the overall Sydney Water's area of operations was around 75%. *The Drinking Water Product Specification* has a target of 90% annual testing compliance. While there are actions which are taken by Sydney Water for owners that do not submit annual test results, these may not always be able to increase compliance to the target

level. Sydney Water also mentioned that the backflow team may be operating to a target of 80%, instead of the 90% target in the *Drinking Water Product Specification*.

A minor shortcoming is identified as documentation for the primary disinfection Critical Control Point (CCP) at Cascade WFP is not in accordance with the *Drinking Water Product Specification*, which requires that free chlorine is monitored prior to delivery to any customers. The process flow diagram and DWQMP for the Cascade system indicates that monitoring for the disinfection CCP comprises monitoring of total chlorine (free chlorine is the relevant indicator for disinfection in a chlorinated system) at the reservoirs in the reticulation, after supply to the first customers. The risk of supplying water that is not suitably disinfected is low as the correct parameter is being monitored at the appropriate location, and corrective action is applied as required; however, it is not identified as a CCP. That is, Sydney Water monitors free chlorine online at the Clear Water Tank (CWT) and the trend showed that free chlorine is maintained at an appropriate level to achieve disinfection. Further, plant shutdown occurs at the low-level limit. It would appear this is mainly a documentation issue, although it must be updated to ensure that the correct priority is given to the free chlorine monitoring at the CWT.

A minor shortcoming was identified in regard to the review of procedures. This did not present a risk to the *Operating Licence* objectives or to public health as it was of an administrative nature. The changed history within documents was not being updated as part of the review process. It was updated in the electronic document management system; however, it is a requirement of Sydney Water's document management process that these details are also up to date in the document itself.

Areas of good practice observed

- Staff interviewed were knowledgeable and aware of their roles and responsibilities.
- Commitment to implementing the Drinking Water Quality Management System.
- Practice of continual improvement.
- Cascade WFP was well operated and managed.
- The reservoir site visited was well maintained.
- Good processes are in place for monitoring water quality, reviewing results, assessing performance and compliance, notifications on out-of-specification water quality and undertaking corrective actions.

Discussion and notes

Implementation of the Drinking Water Quality Management System (DWQMS) for each audited element of the *Australian Drinking Water Guidelines* (ADWG) is discussed below.

Element 1 – Commitment to Drinking Water Quality Management:

Sydney Water demonstrated that the requirements of this element of its DWQMS were fully implemented.

Drinking water quality policy:

Sydney Water's *Drinking Water Management Policy*[16] is shared on the public website and is also available to view by Sydney Water employees on the iConnect (intranet) Policies page, which was sighted during the audit interviews.

As part of staff general inductions, a training module on Compass called "Sydney Water drinking water quality awareness training for staff",[17] is used to provide training and awareness

[16] BMIS0213.13 – Drinking Water ManagementPolicy.pdf.
[17] Compass-Course_outline_WQ_Awareness_training-160824.doc.

to new employees on the *Drinking Water Management Policy* within the organisation. This training module is mandatory for all employees working on a drinking water filtration plant.

When there is an update to the policy, the Water Quality Manager notifies Hub Managers and the BOO (Build Own Operate) partners to share the updated version with their respective teams. The most recent change was on 10 October 2023.[18] Following this change, the policy was printed and displayed on site. On 11 October 2023, the Cascade WFP weekly catch up documented the new *Drinking Water Management Policy* being discussed by the key employees at Cascade WFP.[19]

It was observed during the site inspections that the current version of the *Drinking Water Management Policy* was displayed at the Cascade WFP.

Regulatory and formal requirements:

Sydney Water uses Camms (Organisation-wide Governance, Risk, Compliance, Safety, Health, Environment, Quality (GRCSHEQ) application) to communicate to relevant staff the regulatory requirements for both the Compliance Accountability Register (CAR) and Operating Licence (OL) Compliance obligations. Camms, showing the CAR and OL Compliance were sighted onsite.

Emails are automatically distributed to obligation owners to update if a review is upcoming.[20] There were no significant changes to the regulatory requirements in the audit period that needed to be reflected in any documentation or practices.

The Corporate Compliance team publishes a Legislative update on a fortnightly basis or less often if there are no major changes. This update provides information on recent changes to local and national legislation potentially affecting Sydney Water. The information is gathered from legislative alerts, newsfeeds, NSW Government notification subscriptions and gazette. An example update was provided.[21]

The review requirement for CAR is included in the *Corporate Compliance Management System Manual.*[22] The key contact in the CAR is responsible for reviewing changes and ensuring Sydney Water meets the updated requirements.

Engaging stakeholders:

Relevant stakeholders are outlined in section 1.3 of the *Drinking Water Quality Management Plan* (DWQMP).[23] The Stakeholder Accountabilities Matrix[24] identifies which parts of the organisation have an input in managing stakeholder relationships. Currently, this matrix is undergoing updates to reflect the new Sydney Water structure and is planned to be distributed by December 2024.

Sydney Water's stakeholder organisations that were engaged in the audit period are also reflected in the *2023-25 Enterprise Engagement Plan.*[25]

The quarterly Joint Operational Group (JOG) meetings and the Strategic Liaison Group (SLG) meetings between Sydney Water, WaterNSW and NSW Health as set out in the Memorandum of Understanding (MoU) with NSW Health. These meetings form a key mechanism of engagement for the DWQMS.

[18] Email-FW Sydney Water Drinking Water Management Policy-101023.msg.
[19] Screenshot-Sydney Water Drinking Water Management Policy-120824.png.
[20] Email-For action Operating Licence review requested-130624.msg.
[21] iConnect - 3059385 – Legislative Updates 29 Apr_31 May 2024.
[22] D0000355 – Corporate Compliance Management System Manual.pdf.
[23] BMIS0213 - Drinking Water Quality Management Plan.
[24] 3034593 – 2022&23 Stakeholder Accountabilities Matrix.pdf.
[25] 2964293 – Enterprise Engagement Plan 2023-2025.pdf.

The Q1 2024 meeting minutes[26] and Q3 2024 meeting minutes[27] were provided as evidence.

In addition, it was noted that NSW Health participated in some of the water quality risk workshops.

Element 2 – Assessment of the Drinking Water Supply System:

Sydney Water demonstrated that the requirements of this element of its DWQMS were fully implemented.

Water supply system analysis:

The risk assessment team (workshop participants) are documented in the risk assessment reports. Examples were provided for the Cascade WFP[28] and Delivery System[29] risk assessment workshop reports.

The latest Process Flow Diagram (PFD) for Cascade WFP[30] was field verified on 13 March 2024, which is during the audit period. This was in accordance with the Operational Risk Assessment Workshop SOP (D0000799), which requires that PFDs are reviewed for risk workshops. During the audit site inspection, the PFD was verified as being accurate. However, it was discussed that there are some customers off the rising main prior to the Catalina Reservoir. This information is shown in the Cascade delivery system flow diagram but not on the Cascade WFP flow diagram. It would be useful to show customer offtakes on all WFP process flow diagrams as this will guide risk assessment discussions (for example, in assessing the appropriate locations for CCPs).

OFI-SWC-2024-01: Update the process flow diagram for Cascade WFP to show that there are some customers off the rising main prior to the Catalina reservoir. Apply this to all other process flow diagrams as relevant.

The latest PFD for Cascade Delivery System[29] was reviewed on 29 March 2024. Based on discussions during the audit site inspection, the flow diagram appeared to be accurate.

Assessment of water quality data:

Data for source water quality for Cascade WFP is recorded in the Annual Cascade WFP Risk Assessment Briefing Paper[31] for the period July 2018 – March 2024. Raw and treated water quality data over the last 10 years is also provided in the briefing paper. Exceedances of the ADWG and internal targets are noted in the briefing paper.

Data for the Cascade delivery system is recorded in the Cascade Delivery System Briefing Paper.[32]

The briefing papers for both Cascade WFP and delivery system use trend charts for data analysis for key parameters to inform the risk ratings, which was in accordance with the Operational Risk Assessment Workshop SOP (D0000799), which requires a review for the risk workshop.

Hazard identification and risk assessment:

The operational WFP and network risk assessments are reviewed annually with a full risk assessment held every 3 years. During the audit period, annual risk reviews were completed for the Cascade scheme (WFP and networks). Evidence was verified for this scheme as it was

[26] JOG 2024 Q1 Item 2.1 2023 Q4 JOG Minutes – 13 November 2023.pdf.
[27] JOG 2024 Q3 Item 2.1 DRAFT JOG Minutes - 14 May 2024.docx.
[28] Cascade WFP – Annual Risk Assessment 2024 Summary Paper.pdf.
[29] Cascade Delivery System – Network WQ Risk Assessment Report 2024.pdf.
[30] D0000890 - Cascade WFP - Process Flow Diagram.pdf.
[31] Appendix F - Cascade WFP - briefing paper - annual WFP risk assessment 2024.pdf.
[32] Briefing Paper - Network WQ Risk Assessment, Cascade Delivery System 24.

visited during the site inspections. There is a documented risk assessment procedure.[33] There are triggers for an additional full risk assessment in the procedure. The operational assessments or reviews are held in Q4 of the financial year to allow for maximum data from the year to be included.

The Catchment to Customer (C2C) risk assessment process captures joint strategic water quality risks with WaterNSW. These assessments, the scope of which was reviewed in late 2023,[34] are carried out every 5 years on a rolling basis. The Cascade assessment using the new method has not yet been completed; assessments for the MacArthur, Nepean and Illawarra systems have been completed. The briefing paper, risk assessment reports and risk register were provided.[35]

The latest Cascade WFP operational risk assessment was conducted in May 2024.[36] The latest Cascade delivery system workshop was also conducted in May 2024.[29]

Per- and polyfluoroalkyl substances (PFAS), as a hazard, was discussed during the audit interviews. It was noted that there is a risk 1A.7 in the hazard library 'PFAS in the catchment that are carried through to the treated water leading to water quality impacts'. However, this hazardous event was not risk assessed in the Cascade WFP risk register. It was mentioned by Sydney Water that at the time of the risk workshop, there were no hazard sources identified in the catchment hence risk ID 1A.7 was not considered from the hazard library. Sydney Water treated water testing detected PFAS in the Cascade system at levels comparatively higher than in drinking water supplies, but under ADWG recommended levels. This led to Sydney Water informing WaterNSW, WaterNSW testing for PFAS in the catchments, and WaterNSW detecting PFAS at higher than the ADWG levels in the Medlow Dam (which has been taken offline in response). The source for PFAS in the dam is still not apparent and is being investigated by WaterNSW. Sydney Water intends to test for PFAS monthly in its supply systems (unless the risk profiles indicate otherwise) and weekly for the Cascade and North Richmond systems.

The PFAS C2C risk assessment for Cascade[37] has been reviewed. This was triggered following the elevated PFAS detection in Medlow Dam. This demonstrated that new/emerging risks form an input to the C2C process, as per the DWQMP.

In addition, Health Based Targets (HBT) risk assessments have been completed. The Cascade HBT report was provided,[38] thereby demonstrating that Sydney Water has prepared key system analysis documents as per the DWQMP.

Element 3 – Preventive Measures for Drinking Water Quality Management:

Sydney Water has not demonstrated that the requirements of this element of its DWQMS were fully implemented.

Preventive measures and multiple barriers:

Preventive measures (or controls) are included in the risk registers. During the site inspections at the Cascade WFP and Faulconbridge Reservoir, implementation of selected measures was verified as follows:

[33] D0000799 Operational Risk Assessment Workshop Procedure.
[34] 16102023 C2C Memo-final.pdf.
[35] C2C Illawarra risk ass. briefing paper.pdf, C2C Illawarra risk ass. report-final.pdf, C2C Risk Register Illawarra_post-workshop.xlsx, C2C Nepean risk ass. briefing paper_final–V2.pdf, C2C Nepean risk ass. report_final.pdf, C2C Risk Register Nepean_Post-workshop.xlsx, C2C Macarthur Risk Ass. Briefing Paper.pdf, C2C Risk Register Macarthur_post-workshop.xlsx, C2C Macarthur risk ass. report–final.pdf.
[36] Appendix F - Cascade WFP - briefing paper - annual WFP risk assessment 2024.pdf.
[37] C2C Persistent Chem-Cascades Risk Reg-post-ws-for comment.
[38] HBT ass. Cascade_2023vFinal.

- The Production Officer's (PO) daily rounds sheets were sighted.
- Water monitoring log sheets were sighted.
- Presence and implementation of System Control and Data Acquisition (SCADA) controls were noted.
- The Cascade delivery system risk register includes a control for risk ID 61127 as 'locked and alarmed hatches' for network reservoirs. It was mentioned that the Security Resource Centre monitors alarms. Evidence was provided on the preventive maintenance and testing of the alarms.[39]

The backflow prevention program was discussed. Backflow prevention devices protect the drinking water network from contamination due to reverse flow from a property. The requirement for a backflow prevention device is specified under the *Plumbing Code of Australia*, which aligns with AS/NZS 3500.1: *Plumbing and Drainage Part 1 – Water Services*. A backflow prevention device is required to be tested annually for medium and high-hazard devices. Sydney Water must maintain a register of medium and high-hazard devices and property owners are required to test them. Non-compliance of customer annual testing is managed by Sydney Water in accordance with a documented procedure.[40] A register of backflow devices for properties in the Cascade system was provided along with the summary annual testing compliance status for Cascade and all of Sydney.[41] Examples of system generated annual testing reminder letters were provided.[42] A follow-up letter for overdue testing[43] was also provided, informing of potential water restriction or disconnection if the testing is not completed. However, to date, no restrictions or disconnections have been undertaken.

The annual testing compliance status for the Cascade system was approximately 70% and around 75% for Sydney Water's overall area of operations. While Sydney Water undertakes actions (issue of reminder and overdue letters) for non-compliance, the indication was that these may not always be able to increase compliance (e.g. no real penalties or consequences due to limited regulatory enforcement options). The *Drinking Water Product Specification*[44] has a target of 90% annual testing compliance. The lower the proportion of devices tested, the higher the risk that a device may fail and lead to contamination of the drinking water network. There are multiple barriers in place to prevent contamination; lower testing compliance weakens one barrier.

It was mentioned that the backflow team may be operating to a target of 80% test completion instead of the target nominated in the *Drinking Water Product Specification*.

Sydney Water also has its own backflow prevention devices at the Cascade WFP; these are managed by the planned maintenance (PM) of reduced pressure zone (RPZ) valves. Maintenance work orders are generated annually and completed by delivery partners.[45] The last PM was completed on 19 December 2023.

Sydney Water plumbers also undertake audits of devices on occasions; an example audit record was provided.[46] An example of a backflow containment device test record for a trade waste customer in Cascade was also provided.[47]

Sydney Water demonstrated that it is generally implementing the backflow prevention program; however, a shortcoming is identified due to the low compliance against the target in the *Drinking Water Product Specification*.

REC-SWC-2024-01: Review the implementation of the backflow prevention program, including target criteria and enforceable actions which could be taken to improve compliance.

NSW Health requested that the audit review the installation and operation of emergency pre-treatments at Prospect, Warragamba and Orchard Hills WFPs, and progress on permanent upgrades.

Pre-treatment work has been completed for the Warragamba Actiflo project; however, the Actiflo at Warragamba WFP has been decommissioned. Sydney Water has decided that a similar unit can be mobilised easily if needed in the short-term. A permanent pre-treatment process unit is in the planning phase. An internal memo on 25 October 2023[48] endorsed the decommissioning with a contingency plan to either hire another 1 ML/day Actiflo plant from Veolia, or hire and mobilise the new 1 ML/day pre-treatment unit from SUEZ (Prospect Pilot Plant), in the event it is required in an emergency. However, this document lacks the details on how these contingencies would be implemented.

OFI-SWC-2024-02: Develop a detailed contingency plan for pre-treatment at Warragamba WFP, which includes mobilisation triggers, availability arrangements with suppliers, commissioning timeframes, validation requirements, and the need for consultation with NSW Health and other relevant stakeholders.

Pre-treatment work has been completed for Orchard Hills Sedimentation Tank projects. The Prospect project is progressing and has been planned for completion by end of 2026.

Critical control points:

There are three CCPs identified on the PFD and in the Cascade WFP Process Specification.[49] These were verified in SCADA and against the *Drinking Water Product Specification*.[50]

Filters have individual turbidity analysers. There is a backwash trigger at 0.09 NTU, ripening limit for 60 minutes at 0.2 NTU and a critical (health limit) at 0.5 NTU. The WFP operation is interlocked with the critical limit.

The fluoride target is 1 mg/L with a low alarm at 0.9 mg/L and a high alarm at 1.2 mg/L. The WFP operation is interlocked with the critical limit.

With the primary disinfection (chlorination) CCP, the identified monitoring locations are at Katoomba Reservoir and Blackheath Reservoir. The parameter monitored in real-time is stated as total chlorine in the Cascade WFP PFD and in the Cascade WFP Process Specification document. As per the *Drinking Water Product Specification*, the parameter (indicator) should be free chlorine. In addition, customers are supplied off the rising main prior to the Catalina Reservoir (i.e. upstream of both monitoring locations); CCP monitoring should be before the first customer (as per the *Drinking Water Product Specification*). This would suggest that the CCP monitoring location should preferably be at the CWT outlet. There is free chlorine online analyser at the CWT with a low-level alarm at 0.6 mg/L and high-level alarm at 3.5 m g/L. These interlock the plant; however, the CWT is not identified as the CCP. It was mentioned that C.t is achieved at the CWT (although not displayed visually in SCADA for the Cascade WFP).

The free chlorine trend at the CWT was sighted onsite. The results were >0.5 mg/L (mostly >1.0 mg/L). An exception was seen on 4 April 2024 and was investigated. It was found that the plant shut down when the result was <0.6 mg/L as required.

[39] eventhistory-5317076.pdf, PM-SACVARIOUS SITES–SWSR_SW-SAP202406-1294.msg, SAC7529 JAMIESON_JULT2024.xlsx, Extract Alarm Maint. contract CW2247139.pdf.
[40] 3015707 – C5.3 Manage Backflow Compliance.pdf.
[41] Backflow register and compliance status.xlsx.
[42] PN_4844293_Backflow_Reminder letter.pdf; PN_5024950_Backflow_Reminder letter.pdf & BF Reminder Letter 4363447.
[43] BF Disconnection Letter 4363447.pdf.
[44] IMS0152.01 - Drinking Water Product Specification.pdf.
[45] Email-RE: RPZs on site-130824.msg.
[46] BF_Audit_PN4372261.
[47] Backflow test report-ind. trade waste customer.
[48] Approval memo short term contingency for pre treatment Warragamba WFP_Final_endorsed.pdf.
[49] DOC0542 – Cascade WFP Process Specification.docx.
[50] IMS0152.01 - Drinking Water Product Specification.pdf.

A minor shortcoming is identified as monitoring for the primary disinfection CCP at Cascade is not in accordance with the *Drinking Water Product Specification*. However, since free chlorine is monitored online at the CWT and the trend showed that free chlorine is maintained at an appropriate level and plant shutdown occurs at the low-level limit, the risk is low.

REC-SWC-2024-02: Review location and implementation of the monitoring for the primary disinfection CCP at Cascade WFP in accordance with the *Drinking Water Product Specification* (which is free chlorine and should be monitored at the WFP reservoir outlet before the first customer). In addition, review and update the Cascade WFP process flow diagram and Cascade WFP Process Specification documentation accordingly based on the review findings.

There were no CCP changes or breaches noted in the audit period. There was one incident on 15 June 2024 when a high fluoride detection (>1.2 mg/L) triggered a plant shutdown. Actions were taken to ensure customers were not supplied with out-of-specification water (>1.5 mg/L). The fluoride incident debrief report and presentation[51] were provided.

The alarms in IICATS matched with the documentation.

The CCP alarms and interlocks are tested by the POs as a PM tasks.[52] Examples of work order images and screenshots were provided.[53]

NSW Health requested that the audit review the progress on consistency of controls for critical processes including interlocks for all plants. Sydney Water advised that it is in the process of developing a CCP criteria spreadsheet (a draft was provided)[54] which will serve as a gap analysis of CCP controls and interlocks at all the plants. This work is in progress and is expected to be completed by June 2025.

It was also mentioned that there was no chlorine overdose incident at Macarthur WFP (in response to NSW Health's letter for the audit). The interlocks were raised as an issue in the water quality risk assessment and actions have been identified to interlock the chlorine with plant operation. It was stated that the actions will be tracked as part of the Drinking Water Quality Improvement Plan.

Element 4 – Operational Procedures and Process Control:

Sydney Water demonstrated that the requirements of this element of its DWQMS were fully implemented.

Operational procedures:

Standard Operational Procedures (SOP) are stored in BMIS. If SOPs are overdue for a review, the documents will be noted as 'Expired' on BMIS, which will trigger an email notification to the document controller/author to review the procedure.

Procedures and work method statements are in place for main repairs. A record of mains repairs in the Blue Mountains and Cascade region was provided.[55] These covered all breakdown maintenance (BM) incidents that occurred in the audit period.

Operational monitoring:

Operational monitoring undertaken by the POs at the Cascade WFP was sighted in log sheets during the site inspections. These are being completed as required in line with the monitoring plan. The operators enter data in SCADA Central.

[51] Cascade WFP Fluoride Overdose Incident Debrief Report_Final 230824_DA.pdf & Cascade WFP Fluoride Overdose 150624_final.pdf.
[52] CCP Audit_Draft.xlsx.
[53] CCP Testing at Cascade WFP – various.
[54] CCP Audit_Draft.xlsx.
[55] Maximo-Blue Mountains and Cascade BM Repairs-150824.xlsx.

Field and laboratory (North Ryde) data are entered in Labware which sends notification. Data from Labware is populated into Monitoring BI, which also sends notification. The Labware database was sighted onsite.

A sample of data was reviewed to verify that monitoring at the North Katoomba reservoir was being undertaken.[56]

Reservoir inspections are conducted every 6 months under the Level 0 Reservoir Inspection program.[57] The inspection records for the audit period were provided.[58] Faulconbridge Reservoir (WS0382) was inspected on 18 October 2023 and 11 April 2024 as per the procedure. The Level 0 reservoir inspection record[59] for Faulconbridge reservoir on 11 April 2024 was provided.

There were dead possums and debris found in Jamieson Reservoir in May 2023 (outside of the audit period). The actions undertaken were discussed. Evidence showed that the tank was isolated, NSW Health was notified (via Noggin, confirmation email from NSW Health was provided that Noggin notification was received), tank was cleaned and returned to service. Management of the incident arising from the contamination is discussed under Element 6.

Corrective action:

There is a procedure for corrective action in response to non-conformances,[60] which includes plant/process adjustments. Any adjustments to the plant are implemented on SCADA and are tracked via the event log. An example of a change in ferric dosing concentration was provided.[61] This adjustment was implemented on 13 March 2024 by plant operators because of jar testing.

Water quality exceptions are recorded in daily action reports distributed to internal stakeholders, with monthly and quarterly reports to NSW Health. Details of notable drinking water quality hazards and incidents are recorded in Camms and through event and incident management processes (supported by Noggin system). This is linked to SMS and email notifications.

Equipment capability and maintenance:

Calibration records[62] for the Faulconbridge chlorine analyser demonstrate that it was maintained in accordance with schedule[63,64] (conducted every fortnight and replacement of the membrane cap and electrolyte undertaken every 12 months) during the audit period. The field form is filled in during the calibration, and since October 2023 this has been backed up using the MetroHub App.

Plant instruments are calibrated operationally as needed. The pH instrument APH5156 located at the clear water tank outlet is calibrated monthly.[65] This calibration record aligns with the Schedule for Equipment Maintenance procedure,[66] which states that the online pH meter should be calibrated monthly.

[56] HAA data R394 Nth Katoomba reservoir 2023-24.xlsx.
[57] D0002277 – Level 0 Reservoir Inspection Process.docx.
[58] AIS Reservoir Inspection 23-24 YTD.xlsx.
[59] AISReservoir Inspection – WS0382 Faulconbridge.pdf.
[60] DOC0542 - Cascade WFP Process Specification.docx.
[61] Screenshot – Change to ferric dosing at Cascade WFP-120824.png.
[62] Faulconbridge 23-24 WQ0027 maintenance record.xlsx.
[63] D0001778 – Prominent Dulcometer DACb Online Chlorine, pH and ORP Analyser.docx.
[64] WT5230 – Management of Testing, Calibration and Maintenance of Online and Laboratory Water Quality Monitoring Equipment.docx.
[65] Screenshot – pH instrument calibration record-120824.png).
[66] WTCS5021 – Schedule for Equipment Maintenance procedure.

Certain instruments are calibrated by external providers. Examples of external calibration records performed by HACH were provided.[67]

Materials and chemicals:

Sydney Water has an approved list of chemicals for use in drinking water.[68] Sydney Water developed detailed technical specifications for each chemical used in drinking water. Sydney Water requires the chemicals supplier to carry out independent laboratory analysis for all contaminants regularly and provide contaminant analysis reports to Sydney Water to ensure that the chemicals meet Sydney Water's technical specifications. As an example, the Fluoride contaminant analysis report was provided.[69]

Chemical deliveries at Cascade WFP are checked according to the Bulk Chemical Delivery procedure.[70] An example record for the delivery of ferric chloride on 14 December 2023[71] was provided; this demonstrated that the process is implemented. Operators were trained to implement the Bulk Chemical Delivery procedure on 18 August 2024.[72]

Element 5 - Verification of Drinking Water Quality:

Sydney Water demonstrated that the requirements of this element of its DWQMS were fully implemented.

Drinking water quality monitoring:

The *Annual Drinking Water Compliance Monitoring Plan 2023-24*[73] outlines the monitoring characteristics, locations and frequencies, which are applicable for the Cascade integrated system. This plan is reviewed by stakeholders, including NSW Health, prior to its implementation.

Laboratory data is entered in Labware which sends notifications to a distribution list of Sydney Water staff. Data from Labware is populated into Monitoring BI, which also sends notifications to a distribution list of Sydney Water staff. The Labware database was viewed onsite.

It was verified that *E. coli* monitoring in Cascade[74] was undertaken as per the *Monitoring Plan*.

The testing laboratories are NATA accredited. There is a Field Sampling Techniques procedure[75] which is followed by the field sampling team.

A training record for sampling for a field sampler was provided as evidence of appropriate training being implemented.[76]

Consumer satisfaction:

The procedure *Managing Customer Water Quality Complaints*[77] provides a systematic approach to the management and resolution of all complaints from customers.

Water Quality complaints are received through the Customer Contact Centre. The procedure has triggers for dirty water events and water quality alerts.

[67] External calibrations Cascade WFP.
[68] D0000643 - Approved List of Chemicals.pdf.
[69] Fluoride analysis report -NRA 4461 240724 FSA Sydney water IPL 4010331.pdf.
[70] D0001375 – Bulk Chemical Delivery.docx.
[71] Ferric chloride bulk chemical delivery docket-141223.pdf.
[72] Bulk Chem. Delivery Training Att. Aug 2024.
[73] 3041796 - Annual Drinking Water Compliance Monitoring Plan 2023-24.docx.
[74] Microbiological results-Cascades DS 2023-24.xlsx.
[75] FS0179 – Field Sampling Techniques.pdf.
[76] SOP Sampling Techniques_Koshish Pradhan_Retic Ass. 071123.
[77] D0001661 – Managing Customer Water Quality Complaints.docx.

The Customer Contact Centre operators are trained in a Sydney Water online platform called Confluence. An example staff training record[78] was provided for the complaints training the Customer Hub has undertaken during the audit period.

The Systems Water Quality Team also deliver training to the Customer Contact Centre. The training material was provided as evidence, demonstrating the content of the sessions.[79] The training was not conducted during the audit period so there are no records of its completion.

Once a complaint is classified as "Water Quality", it is directed to the Water Quality Scientists who contact the customer, investigate the issue and if necessary, visit the property to test the water quality. The scientists must complete a competency training framework to be able to be on standby to respond to customer complaints. An example of a training record during this audit period (though still in progress) was provided.[80]

Customer complaints are recorded in Customer Records Management (CRM) system. Details of two customer complaints in the Cascade system[81] were provided as evidence, demonstrating the use of the CRM.

Short-term evaluation of results:

In accordance with Sydney Water's *Reporting Manual*, quarterly water quality reports are provided to customers and NSW Health; examples were provided[82,83]. These reports are reviewed by the Water Quality and Water Product teams prior to being issued to stakeholders.

The Labware system enables evaluation of water quality data and rapid notification of results, where required. Labware notifications were provided as evidence showing how automated emails notified the Water Quality team regarding two water quality incidents:

- Oxley Park - *E. coli* incident (19 June 2024);[84]
- Mt Victoria - Turbidity and Manganese incident (14 December 2023).[84]

Corrective action:

Water quality exceptions are recorded in daily action reports distributed to internal stakeholders, with monthly and quarterly reports to NSW Health. Details of notable drinking water quality hazards and incidents are recorded in the Noggin system. This is linked to SMS and email notifications. Events are reported to NSW Health as documented in the *Drinking Water Quality Event Management Plan.*[85]

The procedure for corrective action in response to non-conformances was also provided.[86]

Element 6 – Management of Incidents and Emergencies:

Sydney Water demonstrated that the requirements of this element of its DWQMS were fully implemented.

Communication:

The emergency contact list is updated every 6 months or upon notification of a major structure change. Evidence showed that the contact list[87] was most recently updated in June 2024.

[78] Screenshot – Complaints handling training records Customer Hub – 200824.png.
[79] Drinking Water Awareness Training CustomerHub.pdf.
[80] D0001673-Libby - Entry 1 on 1 May 24.docx.
[81] CRM-Cascade WQ complaints FY23-24 for OL audit-080824.docx.
[82] Q4 2023-24 Quarterly drinking water quality report – Cascade.pdf.
[83] Q4 2023-24 Quarterly Drinking Water Quality report to NSW Health.pdf.
[84] Folder – Labware notifications for Oxley Park and Mt Victoria incident.
[85] WPIMS5228 – Drinking Water Quality Event Management Plan.pdf.
[86] DOC0542 - Cascade WFP Process Specification.docx.
[87] D0001088 - Water Quality Management Contacts June 2024_Final.xlsx.

Incident and emergency response protocols:

A register of the incidents and hazards from the audit period in Noggin[88] was provided as evidence of the incidents that occurred over the audit period.

Sydney Water mentioned that Noggin automatically notifies NSW Health for water quality incidents (refer to Element 4 discussions on verification of Noggin alert receipt by NSW Health for the Jamieson Reservoir event entry into Noggin). Examples of notification reports from Cascade system hazards were provided:

- Dirty Water Event Catalina Zone[89] - this did not require notification to NSW Health as per the *Drinking Water Quality Event Management Plan* (although it was logged into Noggin). The event was investigated and managed according to the Managing Water Quality Complaints procedure. Evidence of the investigation report was also provided.
- Dirty Water Alert Blackheath Zone[90] - this did not require immediate notification to NSW Health as per the *Drinking Water Quality Event Management Plan* (although it was logged into Noggin). The event was investigated and managed according to the Managing Water Quality Complaints procedure.

Incident triggers are outlined in the *Drinking Water Quality Event Management Plan*. During the Cascade June 2024 Fluoride incident, two SITREPs were sent out to stakeholders through Noggin[91,92]. This was in line with the *Drinking Water Quality Event Management Plan* of preparing SITREPs.

It was noted in the incident log in Noggin (extract 15 June 2024 AEST_ Cascade WFP Fluoride overdosing -19-Aug-2024) that NSW Health was notified. In addition, NSW Health was involved in the Cascade fluoride incident debrief and reviewed the reports. NSW Health provided comments.[93] The fluoride incident was managed according to the *Drinking Water Quality Event Management Plan*: incident was identified; NSW Health was notified; investigations were undertaken; SITREPs were prepared; issue was resolved, and an incident debrief was undertaken.

There were dead possums and debris found in Jamieson Reservoir in May 2023 (outside of the audit period). Evidence showed that the tank was isolated, NSW Health was notified (via Noggin; confirmation email from NSW Health confirmed that Noggin notification was received), the tank was cleaned and returned to service. Finding vermin in reservoirs is an incident in the NSW Health protocol '*Managing pathogen risks in drinking water: response protocol for water utilities and public*', which is included in section 5 of the *Drinking Water Quality Event Management Plan*. This would be considered an incident; all incidents require a debrief. There is no evidence indicating an incident debrief, which should have included NSW Health, was undertaken, although this is not clear in the procedure. This is a shortcoming in implementation, however, is not considered to impact upon compliance as it was outside of the audit period. Therefore, it is considered to be an opportunity for improvement in the context of this audit.

OFI-SWC-2024-03: Review the *Drinking Water Quality Event Management Plan* in relation to events and incident triggers. Ensure that it is clear when incident debriefs require NSW Health to be present for all issues including evidence of vermin found in reservoirs. Appropriate records must be kept of debriefs to demonstrate procedures are being followed.

Site-based scenario testing is scheduled according to the WFPs Emergency Incident Scenario Testing Plan.[94] These test the Cascade WFP Incident Response Manual.[95] During the audit period there were two scenario tests:

- Debrief Loss or Disruption of SCADA or Telemetry[96] conducted on 11 October 2023;
- Chlorine leak site evacuation[97] conducted on 23 January 2024.

One of the actions from the site-based scenario testing for the 'Debrief Loss or Disruption of SCADA or Telemetry' was to review the Cascade Incident Response Manual and remove references to operating any part of the WFP in field mode. It was discussed at the scenario test that field mode is not possible. The procedure was updated 12 August 2024 and field operation has been removed for all PLCs.[98]

Sydney Water has a training course called "*Drinking Water Quality Management System – Drinking Water Quality Event Management Plan & Fluoridation Code of Practice Awareness Training*". The course is registered in Compass but is scheduled and led by the Systems Water Quality team. A list of staff who completed this course in 2023/24 was provided.[99]

Staff and contractors who respond to incidents and use Noggin are trained in using the software for incident and emergency management.[100]

Contractors are also inducted into relevant components of the incident management framework. An example of contractor induction, which includes references to the incident management procedures and emergency protocols, was provided.[101]

Key incident management staff from Sydney Water, WaterNSW and NSW Health gather each year to carry out the annual tripartite simulation exercise to test the Joint Communication Protocols and improve incident preparedness. The exercise for this period was carried out on 28 May 2024. It focussed on the update to the Joint Communications Protocols[102] and data sharing as opposed to incident scenario testing.

Element 7 – Employee Awareness and Training:

Sydney Water demonstrated that the requirements of this element of its DWQMS were fully implemented.

Employee awareness and involvement:

All new staff complete the corporate induction which is held at a WFP and includes drinking water awareness training and a site tour. The drinking water quality awareness training includes a brief explanation of the ADWG, the *Operating Licence* requirements and the role of NSW Health.[103] A course outline for water quality awareness training in Compass was provided.[104] A list of staff who have completed this training was provided.[105]

Employee training:

Sydney Water provides detailed training to new POs, Process Engineers, and other staff in water treatment. The detailed training material is the Unit Process Guidelines (UPGs), with

[88] Noggin Water Quality Hazard Incidents 2023-24.xlsx.
[89] Email-Hazard_ Cascade, 024-2023, Dirty Water Alert Blackheath Zone-031023.eml.
[90] Email-Hazard_ Cascade, 024-2023, Dirty Water Alert Blackheath Zone-031023.eml.
[91] 15 June 2024 AEST_ - SITERP 0001.pdf.
[92] Email-Hazard_ Cascade, 0006-2024 - Boddington main dosing fault-050124.eml June 2024 AEST_ - SITERP 0002.pdf.
[93] Email-External RE Draft Cascade fluoride incident debrief-210824.msg.
[94] D0000633 – WFPs Emergency Incident Scenario Testing Plan.docx.
[95] D0001222.28 - Cascade WFP Incident Response Manual.
[96] Debrief Loss or Disruption of SCADA or Telemetry 111023.docx conducted on 11 October 2023.
[97] CL2 leak site evac.docx conducted on 23 Jan 2024.
[98] D0001222.28 - Cascade WFP Incident Response Manual.
[99] DWQMS-DWQEMP awareness training FY 24.xlsx.
[100] WS&P Noggin User List.xlsx.
[101] Robert Taylor Beakon training records 1.png and Robert Taylor Beakon training records 2.png.
[102] Joint Comms Protocols_FINAL 230824.docx.
[103] Drinking water awareness training General Induction Day.pptx.
[104] Compass-Course_outline_WQ_Awareness_training-160824.doc.
[105] Corporate Site Tour - FY 23-24.xlsx.

examples provided[106,107]. Several days of internal training on the UPGs were conducted during the audit period. Attendance registers and training invites were provided as evidence.[108,109,110]

Compass (online training platform) includes a module on Water Quality Awareness, which is similar to the training delivered at the staff induction, but is tailored to a specific area of operations, e.g. Customer Hub, Network Operations etc. This is instructor led training (by one of the Water Quality Scientists) either in person or via MS Teams. A list of staff who have completed this Compass course was provided.[111] Sydney Water is currently working on a modular e-learning package with the Learning & Development team.

All new WFP POs are required to complete their Certificate III in Water Industry Operations. A completion certificate for a PO at the Cascade WFP was provided;[112] others are near completion.

Employees and contractors undergo training to ensure suitable competency and are adequately trained to carry out their duties. A draft training matrix[113] has been developed but is still being finalised to clearly outline the training required by the water quality operations staff.

Contractor awareness training has been implemented in March and April 2024 by the Water Quality Scientists. Training was provided to Linbeck[114] and Water Brothers[115] contractors. Additional training has been scheduled twice a year for each contractor until 2027 using Camms.[116]

The contractor audit criteria has been updated with input from Water Quality scientists to ensure training requirements are maintained ongoing. Two audits are planned per year; these have also been scheduled in Camms until 2027.[116]

Sydney Water advised that if an issue is identified during the audits, the corrective actions will be entered into Maximo.

Records of completed contractor audits for both Linbeck[117] (30 April 2024) and Water Brothers[118] (12 February 2024) contractors were provided.

It was noted from the evidence that Linbeck has included the training as part of its own internal induction program.[114]

OFI-SWC-2024-04: Maintain water quality awareness training records for staff who undertake audits on network repair works.

OFI-SWC-2024-05: Discuss with Water Brothers regarding them including the water quality training package delivered by Sydney Water into their internal induction program.

Element 8 – Community Involvement and Awareness:

Sydney Water demonstrated that the requirements of this element of its DWQMS were fully implemented.

[106] WTHQ5022- Rapid and High Rate Filtration Generic UPG (Pg 4).pdf.
[107] WTHQ5024- Coagulation and Flocculation Generic UPG (Pg 4).pdf.
[108] Attendance register - UPG training - Coagulation Flocculation -11-03-2024.pdf.
[109] Attendance register -UPG training - Filtration - 12-03-2024.pdf.
[110] Training invite -UPG Coagulation Flocculation - 11-03-24, Training invite -UPG Filtration - 12-03-24.
[111] WQ Awareness training FY24.xlsx.
[112] William Wolf NWP30210 Certificate III in Water Industry Operations certification.pdf.
[113] Draft Water Treatment training Matrix.xlsx.
[114] Email-FW External RE Water Quality presenting at Linbeck Contractors March Toolbox Talk-240724.
[115] Email-External RE Water Quality presentation-080824.
[116] Email-OL Audit Recommendations REC 2023-01 & REC 2023-09.
[117] Email-External Civil Contracts - Site Inspection Form Result #18804839-290424.
[118] Email-RE External Civil Contracts - Site Inspection Form Result #18514675-210424.

Community consultation:

Customers are consulted in the decision-making through the Customer and Community Reference Group, with the agendas, minutes and dates available on Sydney Water website ("Customer and Community Reference Group" webpage).[119]

Sydney Water engages with customers as part of the *Operating Licence* process to set levels of service via the "Our Water, Our Voice" webpage.[120]

Communication:

Sydney Water has a variety of consumer awareness activities and customer engagement activities which are detailed in the iConnect (intranet) Customer and Strategic Insights page.

The Education and Marketing teams go out to the community with the "Wonders of Water" van to public events such as Lakemba Ramadan Nights, the Easter Show as well as schools. During the audit period the Education Team interacted with over 45,000 community members and delivered syllabus linked education programs to over 4,100 students.

Sydney Water also has brand ambassadors (Jess Fox – Website: Take a tour inside our new PRW discovery centre, and Shane Jacobsen – Website: Turn it off Bob – Sydney Water) who promote water conservation campaigns and water futures campaigns.

Element 9 – Research and Development:

Sydney Water demonstrated that the requirements of this element of its DWQMS were fully implemented.

Investigative studies and research monitoring:

Sydney Water is currently involved in the following research projects for drinking water:

- Impacts of Recreational access;[121]
- Identification and characterisation of unpleasant taste/odour chemicals in raw water for informed risk management;[122]
- Ecophysiology of microbes that produce taste and odour chemicals and their impact on treatability.[123]

Sydney Water has three-year Research and Development/Science and Technology (R&D/S&T) plans in place with each Build Own Operate (BOO) partners (SUEZ, Veolia and TRILITY).[124] The BOO S&T program aims to improve the efficiency of operations at the BOO WFPs as well as mitigate the water quality risk. The BOO R&D/S&T is governed by a separate committee comprised of Sydney Water representatives and BOO operator representatives. The R&D/S&T plans of the BOO partnership are aligned with the Sydney Water Corporate Strategy and projects are identified from operational risk assessment.

Sydney Water carries out an annual Operational Risk Assessment or review for each WFP. These risk assessments identify any R&D/S&T works needed to improve the operational efficiency or reduce water quality risks. For example, in the Prospect WFP annual operational risk assessment register, the risk ID #1 and #2 were related to poor source water quality entering the WFP and associated treatment risk. An action was identified as R&D Project Brief D for pilot plant trials with severely deteriorated raw water quality, to identify optimised

[119] https://www.sydneywater.com.au/about-us/our-people/who-we-are/customer-forums.html.
[120] https://www.sydneywater.com.au/about-us/our-organisation/our-water-our-voice.html.
[121] https://www.waterra.com.au/project/understanding-impacts-of-recreational-access-to-drinking-water-catchments-and-storages-in-australia/.
[122] https://www.waterra.com.au/project/identification-and-characterisation-of-unpleasant-taste-odour-chemicals-in-raw-water-for-informed-risk-management/.
[123] JEMA Management of biogenic taste and odour manuscript draft.pdf.
[124] RD ST Plan SUEZ-SW -2020-2023.

chemical dose and emergency sedimentation at Prospect Reservoir. The SUEZ-SW R&D report - Project Brief D - Severely deteriorated raw water[125] was provided as an example of the completed project in June 2024.

Validation of processes:

The R&D project report, SUEZ-SW R&D report - Project Brief D - Severely deteriorated raw water,[126] shows a 'validation' of 'Prospect Reservoir Chemical Dosing' which is an emergency project for short-term risk mitigation for deteriorated quality raw water from the Warragamba Dam. The validation for the emergency project for Prospect reservoir dosing is linked to the Prospect Risk assessment.

Design of equipment:

No new assets were brought online at Cascade WFP during the audit period.

Element 10 – Documentation and Reporting:

Sydney Water demonstrated that the requirements of this element of its DWQMS were fully implemented.

Management of documentation and records:

The *Controlled Documents Procedure*[127] outlines the process for document review and the *Controlled Document Standard*[128] outlines the review frequency according to controlled document type.

Business Management Information System (BMIS) is currently employed as the document management software. BMIS was demonstrated during the audit.

BMIS and Sydney Water Information Management (SWIM) have a workflow for controlled documents, and email notifications are sent to document owners when document review dates are approaching. When there are changes which need to be reflected in a document, the document can be updated outside of the suggested timeframe.

SWIM system is Sydney Water's principal records management system. It contains business records other than quality management system documentation. SWIM is accessed through Sydney Water's iConnect.

The following procedures were checked in BMIS:

- DOC 0542 Cascade WFP Process Specification – this document was last updated on 21 May 2021 (is just outside the 3-year review period). However, the version history table in the procedure was not changed and showed last revision date in 2019.
- WTCS5010 Backwashing Filters – this document was last updated on 6 November 2023 (is current). However, the version history table in the procedure was not changed and showed last revision date in 2021.

The *Controlled Document Standard* requires that the reviewed documents receive a new revision number even after a review where no changes are made. It also required that an issue date is always contained in the document. These documents did not have current issue/revision date/s, which is a shortcoming in the implementation of the procedure. This is an administrative error and does not represent a risk to the objectives of the *Operating Licence* or public health. Reviews were undertaken, but the quality control section of the documents were not updated, even though they were within BMIS.

[125] SUEZ-SW R&D report - Project Brief D -Severely deteriorated raw water.
[126] SUEZ-SW R&D report - Project Brief D -Severely deteriorated raw water.
[127] 2937827 – Controlled Documents Procedure.pdf.
[128] 608701 – Controlled Document Standard.docx.

REC-SWC-2024-03: Take action to ensure that the document control information is updated in the version history table of documents and procedures when they are reviewed or updated, in line with the requirements of the *Controlled Documents Procedure* and *Controlled Documents Standard*

It was mentioned that staff are trained in document management via an e-learning package or by the Management System team.[129] However, it was not clear if POs, who are document owners of plant SOPs, undertake the e-learning package as part of their training.

OFI-SWC-2024-06: Ensure that document management training (including document creation, reviews and updates) is included as a Compass training module for Production Officers.

Controlled documents are managed within the Document Control module of BMIS. The Document Control module provides users with list views that display the review date and the ability to filter documents by management system, business area, and review status. BMIS issues email notification reminders to nominated stakeholders, such as document owners, controllers, and authors, in the lead-up to a specified review date.

The status of controlled documents for Cascade WFP was provided.[130] It showed that only four work instructions were past their review date in the audit period.

Reporting:

A summary of internal and external drinking water reporting is included in the DWQMP. Examples of documents that support the reporting requirements were provided:

- Quarterly drinking water quality report - Cascade Q4 2023-24;[131]
- Drinking Water Quality Compliance and Performance Report 2023-24.[132]

Consumers do not receive a specific annual report; Sydney Water provides quarterly reports which include a summary of water quality data for the previous 12 months and there is a daily drinking water update for each system that is available on Sydney Water's website.[133]

Element 11 – Evaluation and Audit:

Sydney Water demonstrated that the requirements of this element of its DWQMS were fully implemented.

Long-term evaluation of results:

Long-term water quality data was most recently reviewed as part of preparation for the operational water quality risk assessments (Networks[134] and WFP[135]). This aligns with the Operational Risk Assessment Workshop SOP (D0000799).

Trends in the data are reviewed as part of the risk assessment process and captured in the risk ratings and subsequent actions.

Audit of drinking water quality management:

Sydney Water implements an internal 3-yearly-audit cycle. The DW audit schedule was provided.[136] During the audit period Cascades WFP and Warragamba–Orchard Hills WFPs

[129] Screenshot - Staff specific Compass Records for Information Management.
[130] Cascades Controlled Documents.
[131] Q4 2023-24 Quarterly drinking water quality report – Cascade.
[132] 2. Drinking Water Quality Compliance and Performance Report 2023-24.
[133] https://www.sydneywater.com.au/water-the-environment/how-we-manage-sydneys-water/safe-drinking-water/water-analysis.html.
[134] Briefing Paper - Network WQ Risk Assessment, Cascade Delivery System 24.pdf.
[135] Appendix F - Cascade WFP - briefing paper - annual WFP risk assessment 2024.pdf.
[136] DW and RW water audit programs_ 2024 – 2027 Final (1).ppt.

were internally audited, in line with the DW audit schedule. The audit reports were provided.[137,138] The findings and actions from the audits are recorded and tracked in Camms. This process was shown during the onsite interviews.

Element 12 – Review and Continual Improvement:

Sydney Water demonstrated that the requirements of this element of its DWQMS were fully implemented.

Review by senior executive:

The management systems team organises an annual management review for each system, including drinking water (as per the DWQMP). This review involves top management discussing the achievements and improvements made throughout the year. For the audit period, the Drinking Water and Recycled Water Management review was completed on 14 December 2023. The meeting agenda and slide pack were provided as evidence.[139]

Drinking water quality management improvement plan:

Improvements are recorded in the *Drinking Water Improvement Plan* (DWIP) and *Water Supply & Production's Consolidated Action Plan* (CAP). These are then updated based on progress.

It was stated by Sydney Water that during the audit period, a total of 12 improvements were completed. A total of 15 new improvements have been added to the plan during the audit period.

An example of an action being completed in DWIP was provided - action DW22 - Tablet tracking dashboard.[140]

There were two improvements which could not be closed in the proposed time due to commissioning constraints. These were assigned with revised target completion dates.

From a review of the evidence above, it was verified that Sydney Water is monitoring and implementing its improvement plans.

The CAP extract was also provided.[141] It was verified that risk ID 61008 from the Network risk register was included in the CAP. The CAP is updated every quarter. Evidence of an email requesting for quarterly update from the action owners was provided.[142]

Recommendations

The following recommendations are made in respect of this obligation:

- **REC-SWC-2024-01:** By 30 June 2025, review the implementation of the backflow prevention program, including target criteria and enforceable actions which could be taken to improve compliance (relates to Element 3).
- **REC-SWC-2024-02:** By 30 June 2025, Sydney Water is to review the location and implementation of the monitoring for the primary disinfection CCP at Cascade WFP in accordance with the Drinking Water Product Specification (which is free chlorine and should be monitored at the WFP reservoir outlet before the first customer). In addition, review and update the Cascade WFP process flow diagram and Cascade WFP Process Specification documentation accordingly based on the review findings (Element 3).

[137] Final QEM Warragamba-Orchard Hills DWQ Product Mgmt Audit Report 2024-04-12.
[138] Cascade DWQ Product Mgmt Audit Report.pdf.
[139] 2023 12 1MS Steering Committee_Agenda & 2023 12 14 1MS Steering Committee_slide pack.
[140] DWIP actions.xlsx & Tablet tracking dashboard screenshot.png.
[141] Extract-Oper. Risk Ass. CAP_Cascade WFP.
[142] 2024 Q3 CAP update.msg.

- **REC-SWC-2024-03:** By 30 June 2025, take action to ensure that the document control information is updated in the version history table of documents and procedures when they are reviewed or updated, in line with the requirements of the *Controlled Documents Procedure* and *Controlled Documents Standard* (Element 10).

Opportunities for improvement

The following opportunities for improvement have been identified in respect of this obligation:

- **OFI-SWC-2024-01:** Update the process flow diagram for Cascade WFP to show that there are some customers off the rising main prior to the Catalina reservoir. Apply this to all other process flow diagrams as relevant (relates to Element 2).
- **OFI-SWC-2024-02:** Develop a detailed contingency plan for pre-treatment at Warragamba WFP, which includes mobilisation triggers, availability arrangements with suppliers, commissioning timeframes, validation requirements, and the need for consultation with NSW Health and other relevant stakeholders (Element 3).
- **OFI-SWC-2024-03:** Review the *Drinking Water Quality Event Management Plan* in relation to events and incident triggers. Ensure that it is clear when incident debriefs require NSW Health to be present for all issues including evidence of vermin found in reservoirs. Appropriate records must be kept of debriefs to demonstrate procedures are being followed (Element 6).
- **OFI-SWC-2024-04:** Maintain water quality awareness training records for staff who undertake audits on network repair works (Element 7).
- **OFI-SWC-2024-05:** Discuss with Water Brothers regarding inclusion of the water quality training package delivered by Sydney Water into their internal induction program (Element 7).
- **OFI-SWC-2024-06:** Ensure that document management training (including document creation, reviews and updates) is included as a Compass training module for Production Officers (Element 10).

2.2.2 Recycled Water (clause 4.2)

2.2.2.1 Recycled Water – Implementation of RWQMS (sub-clause 4.2.3)

Sub-clause	Requirement	Compliance Grade
4.2.3	Sydney 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 if non-compliant

If the Recycled Water Quality Management System is not fully implemented, there is a high risk that Sydney Water may not be able to effectively manage risks to recycled water quality, thereby posing risks to both public health and the environment.

Evidence sighted

Refer Appendix C (C.2.2).

Summary of audit findings/reasons for grade

Sydney Water demonstrated that the Recycled Water Quality Management System was implemented, with a minor shortcoming.

The focus of this audit was on the Quakers Hill Water Resource Recovery Facility (WRRF), which supplies water to the Stonecutter Ridge Golf Course, which is a low-risk scheme. Evidence from other schemes was considered where relevant to fully address the scope of the audit requirements; for example, some issues such as domestic cross-connections, are not relevant for irrigation schemes.

It was again found that some of the calibrations for instruments were missed. The September 2023 calibration for the residual chlorine analyser (10304400) at Quakers Hill, which requires monthly calibration, was not undertaken. This instrument is used to manage CCP 3 for primary disinfection, and it was noted in the interviews that other calibrations may have been missed during the audit period. This was raised in the last Operational Audit and is already being addressed in response to Recommendation 2023-08; therefore, no new recommendation has been raised. However, it is identified as a minor shortcoming as the issue was not addressed until the end of this audit period.

There were a number of recommendations from the last Operational Audit which have been either fully or partially addressed; however, a definite improvement has been observed. This is evident from the improved audit grade and no new recommendations being identified.

Areas of good practice observed

The positive relationship with the end-user was noticeable. Inspecting the golf course was valuable as the auditors could see that the end-user controls are being taken seriously and are well implemented.

Discussion and notes

Implementation of the Recycled Water Quality Management System (RWQMS) for each audited element of the *Australian Guidelines for Water Recycling* (AGWR) is discussed below.

Element 1 – Commitment to Responsible Use and Management of Recycled Water Quality:

Sydney Water demonstrated that the requirements of this element of its RWQMS were fully implemented.

Responsible use of recycled water:

The development of key processes within the *Recycled Water Quality Management Plan* (RWQMP), including the CCPs and risk assessments, were undertaken with consultation from NSW Health. Currently, the risk assessment processes in Element 2 are being reviewed to align the risk assessment frequency with drinking water to improve resource efficiency.

The Log Reduction Value (LRV) monitoring processes were reviewed in workshops with NSW Health. This monitoring is a critical component of the RWQMP, and efforts have been made to ensure NSW Health's involvement in the review process, with a workshop held in April 2024[143] and reports shared in June 2024.[144] Following the LRV monitoring work, the secondary treatment process monitoring was compiled to assess whether the current CCPs and OCPs are sufficient to ensure the required microbiological log reduction. The findings were presented to NSW Health.[145,146]

Sydney Water consults with recycled water end-users on the contents of their end user agreements and meets regularly with them to ensure they are being implemented appropriately.[147]

NSW Health has confirmed in a submission to the audit that they are satisfied with Sydney Water's level of consultation on matters of mutual concern.[148]

The RWQMP is written and maintained by the Water Product Team led by the Water Product Manager and the Water Product Specialists. The RWQMP document is supported by referenced documentation that is developed by subject matter experts such as the monitoring plans designed by the Monitoring, Design and Reporting team. Position descriptions from the Water Product Team and Monitoring Design and Reporting Team were provided as evidence.[149]

Regulatory and formal requirements:

Section 5.1 in the Corporate Compliance Management System Manual[150] outlines the review policy for the Corporate Accountability Register (CAR)[151] and is also detailed in the CAR Procedure.[152] The key contact in the CAR is responsible for reviewing changes and ensuring Sydney Water meets the updated requirements. A list of compliance accountabilities was provided as evidence in a summary report.[153]

Regulatory obligations are included in the relevant position descriptions, e.g. Water Product Specialist.[154]

[143] LRV review presentation to NSW Health-April2024.pptm.
[144] Email - LRV monitoring proposal email to NSW Health.pdf; LRV Monitoring Process Review-June 2024 and LRV Monitoring Process Review-062024.pdf.
[145] Secondary Process Monitoring Presentation to Health July 24.pptx.
[146] Secondary Process Monitoring - Minutes.docx.
[147] Recycled water customer meeting minutes 280624.pdf & Recycled water customer meeting minutes 120124.pdf.
[148] Submission - NSW Health - Sydney Water.pdf.
[149] PD for Water Product Specialist role.pdf; PD for Water Product Manager role.pdf and Job Description - MDR Lead - Laboratory Services - Customer Experience - EA15.pdf.
[150] D0000355 - Corporate Compliance Management System Manual.pdf.
[151] SWIM 2988479 - Compliance Accountability Register (Interim Update).pdf.
[152] Compliance Accountability Register Procedure.
[153] Compliance Accountability Register 2024 summary report.pdf.
[154] PD for Water Product Specialist role.pdf.

Sydney Water uses Camms (accessed via Sydney Water intranet) to communicate to relevant staff the regulatory requirements for both the Compliance Accountability Register (CAR) and Operating Licence (OL) Compliance obligations. Camms, showing the CAR and OL Compliance was sighted onsite. Emails are automatically distributed to obligation owners to update if a review is upcoming.[155] There were no significant changes to the regulatory requirements that needed to be reflected in any documentation or practices during the audit period.

Compliance Registers under Section 1.2 of the RWQMP detail the process for keeping legal requirements up to date. The Corporate Compliance team publishes a Legislative update fortnightly (unless there are major changes). This update provides information on recent changes to local and national legislation potentially affecting Sydney Water. The information is gathered from legislative alerts, newsfeeds, NSW Government notification subscriptions and gazette. An example update was provided.[156]

Camms was viewed during the audit interviews. The 'My Quick Update' page shows individual actions, audit actions and requirements. It sends email reminders for actions. This is a new process and Sydney Water was in the process of ironing out some teething issues with automatic notifications.

The regulatory requirements are also embedded in procedures as relevant. An example is the *Recycled Water Monitoring Plan for 2023-24*[157] which includes requirements for compliance with the AGWR.

The RWQMP states that regulatory requirements are communicated to customers through regular meetings with business customers.[158,159]

The Quakers Hill RWQMP[160] identifies the governance of the scheme in section 1.2, which includes:

- Customer Agreement between Sydney Water and Stonecutters Ridge Golf Club;[161]
- Environmental Discharge Licence (EPL)[162] issue by the EPA for the Quakers Hill WRP treated effluent discharge to the environment (Licence No. 1724).

Partnerships and engagement of stakeholders (including the public):

The quarterly JOG meetings and the SLG meetings between Sydney Water, WaterNSW and NSW Health as set out in the *Memorandum of Understanding with NSW Health*,[163,164] which forms the key mechanism of engagement for the RWQMS.[165]

Additional engagement occurs through recycled water scheme risk reviews. During the audit period, the Gerringong Gerroa Recycled Water Risk Assessment was reviewed in conjunction with NSW Health.[166] A list of attendees/participants is included in the risk register and seemed to be appropriate.

Sydney Water maintains a one-to-one relationship with business customers supplied recycled water directly from its WRRFs. The only recycled water customer supplied by the Quakers Hill Recycled Water Scheme is Stonecutters Ridge Golf Course. The Business Customer Consultant is the golf course's first point of contact and is available by phone, email, etc. Two six-monthly meetings are carried out each year with a set agenda.[167,168]

Details of the identified stakeholders and associated records are in Section 1.3 of the RWQMP. Table 2 in this section lists the key stakeholders and the mechanisms for involving them.

The Stakeholder Accountabilities Matrix identifies which parts of the organisation have an input into managing stakeholder relationships. Currently, this matrix is undergoing updates to reflect the new Sydney Water structure and is planned to be distributed by December 2024.

Recycled water policy:

The *Recycled Water Management Policy*[169] is shared on the public website,[170] on the iConnect-Policies page and at the plants (these were all verified during the audit). It is part of relevant staff training[171] and updates are communicated to relevant staff via forums and team briefs.

Element 2 – Assessment of the Recycled Water System:

Sydney Water demonstrated that the requirements of this element of its RWQMS were fully implemented.

Source of recycled water, intended uses, receiving environments and routes of exposure:

Section 2.1 details the source of recycled water at the Quakers Hill WRP.[172] During the audit period there were no significant changes. It was noted during the plant inspection that the catchment is mostly residential and that some of the commercial customers are moving out of the catchment.

Recycled water system analysis:

PFDs are controlled documents in BMIS with a review cycle of 3 years. The PFDs are updated ahead of every risk assessment or following significant process change in line with the RWQMP review process.[173] Quakers Hill is towards the end of significant plant upgrades, so the PFD was updated to display the current plant process on the 26 July 2024 and field verified.[174]

As reported in respect of previous recommendation REC-SWC-2023-12 (refer section 3.2.2.8) the filtration CCP turbidity meter at St Marys WRRF was moved to the outlet of the filter on 3 July 2024.[175] Evidence was sought that the RWQMP and other records had been updated to reflect the change. Review of the latest version of the St Marys RWQMP[176] confirms that it reflects this change. The wording in Table 4 indicates that the turbidity meter is 'In the filter backwash tank'.

[155] Email-For action Operating Licence review requested-130624.msg.
[156] iConnect - 3059385 – Legislative Updates 29 Apr_31 May 2024.
[157] SWIM 3034730 - Recycled Water Monitoring Plan 2023-24.pdf.
[158] Recycled water customer meeting minutes 120124.
[159] Recycled water customer meeting minutes 280624.
[160] WQ0005 - Recycled Water Quality Management Plan - Quakers Hill.
[161] Recycled Water Supply Agreement - Stonecutters Ridge Golf Course.pdf.
[162] Quakers Hill EPL.
[163] Sydney Water/NSW Health, *Memorandum of Understanding between the NSW Ministry of Health and Sydney Water Corporation*, 2 August 2021.
[164] At the time of reporting, this version of the Memorandum of Understanding (MoU), which was in place during the audit period, is no longer available on the Sydney Water website; the MoU is now under review and the draft replacement is available on the website.
[165] JOG 2024 Q3 Item 2.1 DRAFT JOG Minutes - 14 May 2024.docx.
[166] D0000257.02 – Gerringong-Gerroa Recycled Water Risk Assessment.xlsx.
[167] Recycled water customer meeting minutes 120124.
[168] Recycled water customer meeting minutes 280624.
[169] BMIS0260.01 - Recycled Water Management Policy.docx.
[170] https://www.sydneywater.com.au/about-us/our-publications/policies.html.
[171] St Marys and Quakers Hill RWQMP Refresher Training Attendance Form.ppt.
[172] WQ0005 - Recycled Water Quality Management Plan - Quakers Hill.
[173] D0001681 – Recycled Water Risk Assessment Workshop Procedure.docx.
[174] D0002375 – Quakers Hill Recycled Water PFD.
[175] St Marys WRRF - CCP SCADA and Photos.pptx.
[176] WQ0008 - Recycled Water Quality Management Plan - St Marys (Version 4).

Assessment of water quality data:

The annual monitoring plan[177] includes source water, process and recycled water quality testing for recycled water. Results are collated and the Quarterly Recycled Water Quality Monitoring Report for NSW Health is tabled at the JOG, including exceptions.[178,179]

Trend charts are used for water quality risk assessments but were not included in the previous Quakers Hill WRRF risk assessment briefing paper; processes have been updated since then. The recent Gerringong Gerroa WRRF Risk Assessment Briefing Paper has trends, which shows how they will be used going forward.[180] It was noted that the last briefing paper for the Quakers Hill WRRF could not be found by Sydney Water.

OFI-SWC-2024-07: Ensure that all records for RWQMP risk assessments are appropriately retained.

Hazard identification and risk assessment:

As part of the RWQMP review process, a review of the recycled water system, risk assessment, review of long-term water quality parameters, incidents/events is undertaken as part of every water quality risk assessment (currently 3-yearly).[181] This procedure has just come into effect and there were no risk reviews from the new procedure in the audit period. It can be seen that this was the case in the recent Gerringong Gerroa WRRF Risk Assessment.[182]

LRVs were being calculated every 4 years and every plant, except Quakers Hill has had two rounds of monitoring and risk update. Quakers Hill was delayed due to ongoing construction. The last round of intensive LVR monitoring and risk assessment are due to be undertaken in 2024/25.[183]

Element 3 – Preventive Measures for Recycled Water Management:

Sydney Water demonstrated that the requirements of this element of its RWQMS were fully implemented.

Preventive measures and multiple barriers:

The risk register for the WRRF includes existing controls. These are fairly high-level and mainly refer to programs, rather than specific actions.[184] The process specification has more detailed actionable target/controls. There is a generic specification for all recycled water schemes[185] and a specific one covering the individual plant.[186] The RWQMP for the plant also has details of each CCP and the actions/controls that are in place.

Many of the controls on the plants are implemented via SCADA. During the site visit it was noted that the free chlorine level was too low to meet the recycled water specification and the recycled water pumps were interlocked. In addition, there are plant checklists that operators complete Monday to Friday for plant inspections and taking readings off instrumentation.[187,188,189]

[177] 3034730 – Recycled Water Monitoring Plan 2023-24.pdf.
[178] JOG 2024 Item Q3 7.4 RW Quality Update.pptx.
[179] SWIM 3066265 – Quarter 4 2023-24 Quarterly Recycled Water Report to NSW Health Final.pdf.
[180] D0000257.01 – Gerringong Gerroa Briefing Paper.
[181] D0001681 – Recycled Water Risk Assessment Workshop Procedure.docx.
[182] D0000257.01 – Gerringong Gerroa Briefing Paper.
[183] LRV Monitoring Process Review-June 2024.
[184] D0000257.02 - Gerringong-Gerroa Recycled Water Risk Assessment.
[185] D0000096 - Recycled Water Product Specifications.
[186] D0001266 - Quakers Hill WRRF Process Specification.
[187] Quakers Hill WRRF - Plant Checksheet 1.
[188] Quakers Hill WRRF - Plant Checksheet 2.
[189] Quakers Hill WRRF - Plant Checksheet 3.

The recycled water compliance monitoring plan is used to validate the performance of onsite SCADA controls.[190]

End-user on-site preventive measures are outlined in Schedule 3 of an end user's Recycled Water Supply Agreement.[191] The end-user is responsible for implementing the required preventative measures and reporting their compliance through an annual statutory declaration.[192] Sydney Water also has an audit program, whereby each WRRF is audited every 3 years. Quakers Hill was audited during the audit period. The audit included end-user controls.[193]

It was also confirmed onsite at Quakers Hill WRRF and Stonecutters Ridge Golf Course that preventive measures were being implemented. This included:

- Interlocks on tertiary disinfection;
- Interlocks on a bypass event;
- Irrigation setbacks;
- Irrigation drift control, sprinklers shut off in high wind;
- Irrigation storage fenced;
- Tertiary filter backwash;
- Coagulation jar tests undertaken as required.

As part of NSW Health's input to the audit, it requested that a review of the cross-connection controls for recycled water be undertaken. In this audit the Quakers Hill WRRF was inspected; as this plant supplies water for irrigation, this is a very low risk for cross connection. The greatest risk is supply to domestic properties via reticulation. The Rouse Hill Recycled Water Scheme is a third-pipe scheme where recycled water is plumbed into domestic properties, this was discussed in detail and in relation to completion of Recommendation 2023-03, which is discussed in **section 3.2.2.1** of this report.

There were no cross-connections identified during the audit period, however, there were two identified through complaints after 30 June 2024. It is recommended that these are followed up in the next Operational Audit. One was in a disability centre, where it appeared that there were plumbing changes post the Building Commission inspection, and another in North Kellyville that is still under investigation.

The operational risk assessment was held for the Prospect North drinking water network,[194] which includes two risks relating to recycled water cross-connections from the Rouse Hill dual reticulation system. There was one new action identified as part of the 2024 risk assessment, which related to investigating water meters that measure pressure, for quick identification of incorrect connections.[195] The two risks identified relate to the contamination of the Sydney Water drinking water network by a cross-connection in the mains or on private property. The risk of cross-connections in private plumbing is covered in the General Network Risk Assessment (Risk ID: 54596); it is worded as Sydney Water having a perceived responsibility.

The AGWR clearly identifies residential cross-connections as a hazardous event that should be considered during a risk assessment. The risk presented by Sydney Water includes a number of third-party issues and there are no controls identified for residential cross-connections. This may not be under the direct control of Sydney Water, but it can be influenced by them to help

[190] SWIM 3034730 - Recycled Water Monitoring Plan 2023-24.pdf.
[191] Recycled Water Supply Agreement - Stonecutter's Ridge Golf Course.
[192] Annual Statutory Declaration 2024 – Stonecutter's Ridge Golf Course.pdf.
[193] Quakers Hill AUDIT Report 2023.
[194] Network WQ Risk Register - Prospect North Delivery System 2024.xlsx.
[195] Prospect North Network Water Quality Risk Report 2024.pdf.

reduce the risk to the recycled water service. This audit is only considering implementation of the RWQMP and therefore this is identified as an opportunity for improvement.

OFI-SWC-2024-08: Review the General Network Risk Assessment (Risk ID: 54596) and consider what controls can be implemented or influenced by Sydney Water to manage the consequences of a cross-connection on private property, on the occupants of that property.

Critical control points:

CCP SCADA setpoints are hardcoded into SCADA and cannot be changed without undergoing the change management process.[196]

CCP set points were checked onsite and SCADA reviewed, and they were found to be as specified and to react as expected. There were no issues identified in relation to CCPs during the audit period. It was, however, noted during the site inspection that POs cannot easily identify when an interlock has occurred, due to CCP limit being triggered, and list how often a CCP critical limit is reached. This could be useful in risk assessments and part of process improvement.

OFI-SWC-2024-09: Add the functionality to SCADA that allows Production Officers to collate interlocks based on CCP triggers to allow them to be reviewed and considered in meetings and risk assessments.

NSW Health recommended that the consistency of controls for critical processes be reviewed during this audit. Sydney Water utilises the *Recycled Water Product Specification*[197] to manage critical control point interlocks. A review of these controls has been completed by Sydney Water as part of the assessment of secondary processes monitoring and controls across all recycled water plants and has been presented to NSW Health.[198] Further work is planned to review and streamline critical control points and controls across all recycled water plants based on the processes used and their end users. There is some variation in the critical limits currently used for recycled water plants that have the same end-use for the water. Tertiary filtration turbidity is one, as well as chlorine residual (although it is the C.*t* factor rather than concentration that should be standardised).

Element 4 – Operational Procedures and Process Control:

Sydney Water demonstrated that the requirements of this element of its RWQMS were mostly implemented; however, some minor shortcomings were identified.

Operational procedures:

It can be seen that procedures are implemented through records maintained on log sheets and the plant diary.[199,200] This was also verified during the plant inspection.

Whilst onsite, the audit team checked that the appropriate procedures could be accessed at the plant by POs, and this was the case. This included log sheets, calibration records, meeting records,[201] and the plant diary, which are all maintained.

Operational monitoring:

Systems used to store operational data include:

[196] Quakers Hill WRRF - SCADA Recycled Water Interlocks 1.png & Quakers Hill WRRF - SCADA Recycled Water Interlocks 2.png.
[197] D0000096 - Recycled Water Product Specifications.docx.
[198] Secondary Process Monitoring Presentation to NSW Health.pptx.
[199] Quakers Hill WRRF – Plant Checksheets 1,2 & 3.pdf.
[200] Quakers Hill WRRF – Plant Diary.pdf.
[201] Quakers Hill WRRF - Meeting Minutes 290424.docx.

- SCADA – viewed onsite.
- SCADA Central – for laboratory testing data completed on site at the WRRF.[202]
- Monitoring BI – for monitoring/verification testing completed by Laboratory Services (recycled water monitoring plan), viewed during the interviews.
- Log sheets,[199] viewed on site.

Based on the evidence, operational monitoring was completed as per the monitoring plan.[203]

Operational corrections:

Quakers Hill WRRF is operated to the Process Specification to ensure processes upstream of the CCPs are operated effectively. Process monitoring via SCADA and laboratory analysis, adjustment of process set points, and responding to alarms are part of the operational controls applied on site.[204]

There are alarms coded into SCADA that notify plant operators when there is a water quality performance excursion. A log of call outs, which occur when a critical alarm has been activated out of plant hours, has been included as evidence.[205] The log includes the reason for the callout and the steps taken by the PO to resolve the cause of the alarm. Issues are also discussed in the weekly Hub meetings; minutes from 26 June 2024 show that an issue was discussed and the potential impact on the PRW.[206]

Trends are produced in SCADA Central and analysed by site staff. An example has been provided for Free Chlorine as evidence.[207]

Equipment capability and maintenance:

Maximo is Sydney Water's asset management system, which is used to schedule maintenance work and keep records of work carried out.

An extract from Maximo shows the planned maintenance activities (PMs)for CCPs at Quakers Hill WRRF[208] and a schedule for the calibration of instruments has also been provided.[209] These appear to be appropriate to ensure ongoing equipment capability.

It was noted that the chlorine analyser (10304400) was not calibrated in September 2023.[210] This issue was previously identified and is being addressed through Recommendation 2023-08 (refer **section 3.2.2.6**). This is a monthly calibration and, as Sydney Water implements a water quality risk management process with multiple barriers, missing one month was considered to not compromise the objectives of the *Operating Licence* or risk public health. Accordingly, this was considered to be a minor shortcoming. No recommendation is made as the issue was addressed and closed out in August 2024 as part of previous Recommendation 2023-08.

Completion of PMs is discussed in more detail in section 2.3.4.1 (in respect of sub-clause 5.5.2). However, it can be seen that planned maintenance is discussed in the weekly hub meetings and is being implemented.[211,212]

Materials and chemicals:

Management of chemical quality assurance is undertaken in accordance with the Bulk Chemical Data Capture and Assessment Procedure.[213] This ensures that the appropriate records are maintained.

Chemicals are received onsite in accordance with the Wastewater and Recycled Water Bulk Chemical Delivery Procedure.[214] The following evidence was provided to demonstrate that the procedure is being followed:

- Ferrous chloride delivery docket.[215]
- SBS delivery docket, including chemical quality assurance certificate.[216]

- Chemical Contaminant Sheet SBS.[217]
- Chemical Contaminant Sheet Ferrous.[218]

The evidence demonstrates that the procedure is being undertaken. However, it is difficult to trace chemical batches through the process as the delivery records do not appear to include batch numbers.

OFI-SWC-2024-10: Review how the management of bulk chemicals can be improved so that batches can be traced through the quality assurance process.

Element 5 – Verification of Recycled Water Quality and Environmental Performance:

Sydney Water demonstrated that the requirements of this element of its RWQMS were fully implemented.

Recycled water quality monitoring:

Sampling and analysis are conducted in accordance with the *Recycled Water Monitoring Plan*.[219] This specifies the required monitoring for each recycled water scheme. The monitoring location QH0002 is the wet well for pumping to the golf course irrigation. An extract of data from Monitoring BI (EKAMS) for the audit period showed that the required analysis was being undertaken.

It was noted that the new rolling program of LRV monitoring was to start in late 2023, as stated in the monitoring program. It appears that it has taken longer to implement this new approach; in a presentation to NSW Health, it states the monitoring is proposed to start from 1 July 2024.[220]

Application site and receiving environment monitoring:

Sydney Water provides quarterly reports to the Stonecutters Ridge Golf Course[221] regarding the water supplied.

Under the Supply Contract,[222] the irrigator takes responsibility for the application of the recycled water, and they will comply with a Land Suitability analysis. During the site inspections, the golf course was inspected, and it was noted that the storage pond could not overflow to the environment under normal operations. The golf course was also well aware of the risk associated with soil sodicity and took regular soil samples and implemented recommended treatments such as the addition of lime and gypsum.

[202] Quakers Hill WRRF - SCADA Central Trends Free Chlorine.
[203] D0001344.10 - Wianamatta Hub Sampling and Analysis.
[204] D0001266 – Quakers Hill WRRF Process Specification.
[205] Quakers Hill WRRF – Callouts.xlsx.
[206] 260624 Chicken Minutes Quakers Hill.
[207] Quakers Hill WRRF - SCADA Central Trends Free Chlorine.
[208] Quakers Hill WRRF - CCP PMs.
[209] Quakers Hill WRRF – Calibration of Field Equipment Schedule 2024-25.docx.
[210] ACL8120 PM for FY 23-24 to present.
[211] 260624 Chicken Minutes Quakers Hill.
[212] Quakers Hill WRRF - Meeting Minutes 290424.docx.
[213] OS0015 – Bulk chemical data capture and assessment.
[214] D0001388 – Wastewater and Recycled Water Bulk Chemical Delivery.
[215] Quakers Hill WRRF – Chemical Delivery Ferrous Chloride.pdf.
[216] SBS delivery docket COC.
[217] Chemical Contaminant Sheet SBS Screenshot.
[218] Chemical Contaminant Sheet Ferrous Screenshot.
[219] SWIM 3034730 - Recycled Water Monitoring Plan 2023-24.
[220] LRV review presentation to NSW Health-April2024.
[221] Q3 2023-24 Stonecutters Golf Course Quarterly Client Report.pdf.
[222] Recycled Water Supply Agreement - Stonecutter's Ridge Golf Course.

Documentation and reliability:

Sampling and analysis are conducted in accordance with the *Recycled Water Monitoring Plan.*[223] This specifies the required monitoring for each recycled water scheme. Based on the plant inspection and interviews the monitoring plan appears to be representative.

Satisfaction of users of recycled water:

End users supplied with recycled water under a recycled water supply agreement are assigned a Business Customer Consultant who acts as a single point of contact. The formal, planned communication channel for these customers is six-monthly recycled water customer meetings. These meetings present a formal, regular opportunity for customers to raise complaints to their relationship manager. Therefore, there are no complaints registered, issues are worked through and issues raised through the relevant Sydney Water channels.[224,225]

Recycled water complaints for non-contracted customers (residential – Rouse Hill) are managed in the same way as drinking water complaints. Water quality complaints are received through the Customer Contact Centre. Triggers for dirty water events and water quality alerts are outlined in Section 4.1 of the *Managing Water Quality Customer Complaints Procedure.*[226]

The Customer Contact Centre is trained in an online platform called Confluence. Staff are trained to use the platform; evidence of training was provided.[227]

Customer complaints are recorded in Customer Records Management (CRM) system. There were no recycled water complaints during the audit period.[228]

Short-term evaluation of results:

The laboratories send notifications for water quality exceptions to the nominated parties. An example email notification from the Limnos Database for an *E. coli* detection was provided as evidence.[229]

Corrective responses:

Where changes to processes are required, Sydney Water has a change management process to ensure that risks are managed when processes are changed/adjusted. An example of this process at Quakers Hill[230] and the St Marys[231] WRRFs were included as evidence of it being undertaken.

Element 6 – Management of Incidents and Emergencies:

Sydney Water demonstrated that the requirements of this element of its RWQMS were fully implemented.

Communication:

Sydney Water maintains a recycled water contact list for internal and external stakeholders[232] to ensure communication is rapid during recycled water events. It is updated every six-months or if there is a major change; it was most recently updated in June 2024.

[223] SWIM 3034730 - Recycled Water Monitoring Plan 2023-24.
[224] Recycled water customer meeting minutes 280624.pdf.
[225] Recycled water customer meeting minutes 120124.pdf.
[226] D0001661 – Managing Customer Water Quality Complaints.docx.
[227] Managing Customer Water Quality Complaints Training Record B Oliver.png.
[228] RW complaints 2023 - 2024.xlsx.
[229] Email: Recycled Water (Industrial) - E.coli exceedance report.eml.
[230] Quakers Hill WRRF – Change Management Form – CCP Interlocks.
[231] St Marys WRRF – Change Management Form – CCP Turbidity Meter.
[232] D0001088 - Water Quality Management Contacts June 2024_Final.xlsx.

Incident and emergency response protocols:

There were no incidents in the audit period.

The RWQMP[233] refers to the *Recycled Water Quality Event Management Plan*[234] on how incidents are managed.

It was noted that the RWQMP and *Event Management Plan* both still refer to SWIRL. This is no longer used; a new platform called Camms was brought into use for recycled water incident management at the start of the audit period. These documents require updating.

OFI-SWC-2024-11: Ensure that all incident management procedures are updated to reflect the implementation of Camms.

During the audit period two incident scenarios were tested and run as training:

- High ammonia in recycled water.[235]
- Call out – PO received phone call at 2 am from SOC first flush flooded.[236]

Element 7 – Operator, Contractor and End User Awareness and Training:

Sydney Water demonstrated that the requirements of this element of its RWQMS were fully implemented.

Operator, contractor and end user awareness and involvement:

Corporate site tours are held as part of Water Quality awareness training; 416 staff members had a site tour during the audit period.[237] This captures all new staff.

Refresher training in RWQMP awareness[238] was undertaken by staff at Quakers Hill and St Marys WRRF over the audit period.[239]

Training is provided for Sydney Water employees. Slides for the "Our Water, Our Voice" training session for July 2024 are included.[240]

Awareness for end users, such as the Stonecutters Ridge Golf Club, is provided through the six-monthly meetings.[241,242]

Operator, contractor and end user training:

The RWQMP section 7.2 identifies that staff learning is managed through the Compass software. However, it seems that the training and competencies are managed differently across the organisation, with some areas using Compass more extensively than others. Managers use spreadsheets to manage training requirements.

OFI-SWC-2024-12: Use a single platform/process to track training and training requirements consistently across the business.

The *Production Onboarding Learning & Development Procedure*[243] specifies the required training for Production staff. All new staff will require a Certificate III in Water Industry Operations. There are currently 34 staff members undertaking their certification.[244]

[233] BMIS0260 – Recycled Water Quality Management Plan.docx.
[234] WR5271 - Recycled Water Quality Event Management Plan.docx.
[235] Quakers Hill WRRF - Scenario Training Out of Spec Recycled Water.
[236] Quakers Hill WRRF - Scenario Training First Flush.
[237] Corporate Site Tour - FY 23-24.xlsx.
[238] QH_StM RWQMP Refresher Training Package.
[239] St Marys and Quakers Hill RWQMP Refresher Training Attendance Form.
[240] OWOV Employee Session July 2024.pdf.
[241] Recycled water customer meeting minutes 280624.
[242] Recycled water customer meeting minutes 120124.
[243] D0001534 Production Onboarding Learning & Development Procedure.
[244] Cohort list WRR Cert III_Feb 23.

A new *Production Officer Training Schedule*[245] was provided for St Marys; it included the basic competencies required at the WRRF including review of the relevant UPGs.

End users have a responsibility under their Recycled Water Supply Agreement to ensure that only suitably qualified staff and trained personnel operate facilities associated with the use of recycled water. Sydney Water manages fulfilment of this requirement through the use of an annual statutory declaration.[246]

Element 8 – Community Involvement and Awareness:

Sydney Water demonstrated that the requirements of this element of its RWQMS were fully implemented.

Consultation with users of recycled water and the community:

Sydney Water has a Customer and Community Reference Group for engagement, details of which are on its website.[247] This group meets every two months. There have been ongoing discussions regarding Purified Recycled Water (PRW); these have been ongoing through the audit period. Discussions to date have been summarised in a report.[248] Evidence has been provided of the material presented during the audit period:

- 231127 CCRG-PRW welcome presentation-FINAL.
- 231127 CCRG-WSAA Presentation Global context of PRW.

Sydney Water engages with customers as part of the *Operating Licence* process to set levels of service as evidenced by the "Our Water, Our Voice" webpage Customer Engagement Strategy.[249]

Communication and education:

Community involvement and awareness is Section 8 of the RWQMP.

Information is available on Sydney Water's website, Recycled water systems page.[250] This includes details on how recycled water is produced and how to safely use it. There is also information on social media platforms such as Facebook.[251]

The Purified Recycled Water Discovery Centre was launched at the end of 2023 as an education, training and awareness centre for the benefits of incorporating recycled water as part of a resilient water supply. Internal Sydney Water staff tours have been going on since late 2023 and are now open to the public. This will be marketed in the future to promote the facility and increase visitor numbers.

The Education and Marketing team goes out to the community with the Wonders of Water van to public events such as Lakemba Ramadan Nights, the Easter Show as well as schools. During the audit period, the Education Team estimated that they interacted with over 45,000 community members and delivered syllabus linked education programs to over 4,100 students.

Element 9 – Validation, Research and Development:

Sydney Water demonstrated that the requirements of this element of its RWQMS were fully implemented.

[245] New Starter Form - Cassandra Salas.
[246] Annual Statutory Declaration 2024 – Stonecutter's Ridge Golf Course.pdf.
[247] https://www.sydneywater.com.au/about-us/our-people/who-we-are/customer-forums.html.
[248] Customer and Community Reference Group - Summary of discussions on Purified Recycled Water.
[249] https://www.sydneywater.com.au/about-us/our-organisation/our-water-our-voice.html.
[250] https://www.sydneywater.com.au/water-the-environment/how-we-manage-sydneys-water/recycled-water-network.html.
[251] https://www.facebook.com/SydneyWater/videos/take-a-tour-inside-our-new-purified-recycled-water-discovery-centre-with-olympic/852721789931255.

Validation of processes:

Section 9 of the RWQMP outlines Sydney Water's approach to research and validation for recycled water.[252] The main approach is the continual validation of Log Reduction Values (LRV) for recycled water schemes.[253] LRV is a way of quantifying the level of treatment being delivered for specific groups of pathogens. The level of pathogens in the source water is known to be consistently high, therefore it is the exposure to recycled water that determines the level of treatment required. The use of the recycled water dictates the level of treatment, quantified by LRV. Sydney Water does targeted monitoring to validate that recycled water schemes achieve the required LRVs.

Design of equipment:

Ongoing research into LRVs in Membrane Bioreactors is being conducted:[254]

- The Revised-WaterRAReport-1223[255] provides examples of implementation of the research program into assigning and maintaining appropriate pathogen LRVs in Membrane Bioreactors to recycled water.
- WaterRAProject3050 Lit Review 13323[256] is a literature review for the MBR project.

Investigative studies and research monitoring:

A review of the two rounds of LRV verification monitoring data for all the WRRF systems has been completed[257] and a new approach has been proposed instead of the 4-yearly LRV monitoring program and presented to NSW Health. This is documented in the LRV Monitoring Process Review,[258] and a summary of previous monitoring data.[259] This was presented to NSW Health in June 2024.[260]

Element 10 – Documentation and Reporting:

Sydney Water demonstrated that the requirements of this element of its RWQMS were fully implemented.

Management of documentation and records:

BMIS is currently used as the document management software and information can be extracted when required.[261]

Controlled Documents are handled in the Document Control module of BMIS (HCL Notes), accessible through both web and desktop interfaces. This module offers list views showing review dates and allows filtering by management system, business area, and review status. There is also a specific view for documents that have passed their review date.

BMIS issues email notification reminders to nominated stakeholders, such as document owners, controllers, and authors, in the lead-up to a specified review date.

Sydney Water's primary records management system, SWIM, stores business records excluding quality management documentation. Accessible via iConnect, SWIM 189255 Information Assets records and data Policy outlines the requirements for individuals to create, capture, and preserve electronic files such as reports, documents, spreadsheets, and scanned information.

[252] BMIS0260 - Recycled Water Quality Management Plan.
[253] PAMWP0001 – Recycled Water Treatment Plant Validation Monitoring for Pathogen Removal.docx.
[254] LRVs in MBRs 3050 Project Plan.docx.
[255] Revised-WaterRAreport-1223.docx (Pg 2).
[256] WaterRAProject3050 Lit Review 13323.pdf.
[257] Log Reduction Value Monitoring Report.
[258] LRV Monitoring Process Review-062024.pdf.
[259] Log Reduction Value Monitoring Report-062024.pdf.
[260] LRV review presentation to NSW Health-April2024.pptm.
[261] WR5271 - Recycled Water Quality Event Management Plan.

These systems were reviewed whilst in the audit interviews and they seemed to be well managed, although it was not always easy to find the required document or record, especially for a novice. Sydney Water is currently developing SharePoint pages for each scheme that provide a quick link to all of the relevant documents and records.

In addition to these systems, the audit team also reviewed records in the following:

- SCADA
- SCADA Central
- Monitoring BI (EKAMS)
- Compass
- MAXIMO.

Reporting:

Reporting requirements are in Table 5 of the RWQMP with information on the purpose, audience (e.g. customer via website) and frequency noted. Evidence of these reports being prepared is as follows:

- Annual Recycled Water Compliance and Performance Report.[262]
- Quarterly recycled water quality reports.
- Quarterly recycled water customer reports.[263]
- Incident and event reporting.
- Corporate Performance Report.

Element 11 – Evaluation and Audit:

Sydney Water demonstrated that the requirements of this element of its RWQMS were fully implemented.

Long-term evaluation of results:

Long-term recycled water quality data is evaluated as part of the risk review process, most recently for the Gerringong Gerroa scheme.[264] The briefing paper includes review of 10-years' worth of data for key parameters.

Audit of recycled water quality management:

Sydney Water implements an internal 3 yearly-audit cycle;[265] audits appear to have been undertaken in accordance with this. Only two plants have not been audited; they are the St Marys AWTP and Quakers Hill Demo Plant, neither of which are operational.

In this audit period, Bingara Gorge underwent an audit[266] to compare its existing quality management system with Sydney Water's. This plant was operated by a WIC Act Licensee prior to transfer to Sydney Water. The Quakers Hill WRRF was also audited.[267] These audits resulted in several findings and actions[268] which have been recorded in Camms.[269] The Camms system was reviewed during the audit interviews.

[262] Annual RW Quality Compliance and Performance Report 2023-24 Final.
[263] recycled-water-quality-report-rouse-hill Apr - Jun 2024.
[264] D0000257.01 – Gerringong Gerroa Briefing Paper.
[265] RW Audit Scoring Tool Sep 2023.
[266] Bingara Gorge RWQM Audit Report.
[267] Quakers Hill AUDIT Report 2023.
[268] Quakers Hill Audit Actions register.xlsx.
[269] CAMMS insights view Quakers.png.

Every recycled water audit encompasses a review of at least one end-user to evaluate their control measures. For the two audits conducted this financial year, an end-user was chosen for assessment. Audit findings were shared with relevant stakeholders and recorded in Camms.

Element 12 – Review and Continuous Improvement:

Sydney Water demonstrated that the requirements of this element of its RWQMS were fully implemented.

Review by senior managers:

Sydney Water's RWQMP states, in section 12.1, that an annual management system review is to be undertaken. For the current audit financial year, the Drinking Water and Recycled Water Management review was completed in December 2023. The meeting agenda and slide pack were provided as evidence.[270,271]

Recycled water quality management improvement plan:

During this financial year, a total of 17 improvements were closed.[272] These improvements cover different areas across the business.

There were 11 improvements not closed in the proposed time due to commissioning constraints. These 11 improvements have revised dates to be closed from December 2024 to the 30 June 2026.

The *Improvement Plan*[273] is continually updated by the Product Optimisation team and monitored by the Water Product team. Completed actions are reported quarterly to NSW Health during the JOG meetings.[274]

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

The following opportunities for improvement have been identified in respect of this obligation:

- **OFI-SWC-2024-07:** Ensure that all records for RWQMP risk assessments are appropriately retained (Element 2).
- **OFI-SWC-2024-08:** Review the General Network Risk Assessment (Risk ID: 54596) and consider what controls can be implemented or influenced by Sydney Water to manage the consequences of a cross-connection on private property, on the occupants of that property (Element 3).
- **OFI-SWC-2024-09:** Add the functionality to SCADA that allows Production Officers to collate interlocks based on CCP triggers to allow them to be reviewed and considered in meetings and risk assessments (Element 3).
- **OFI-SWC-2024-10:** Review how the management of bulk chemicals can be improved so that batches can be traced through the quality assurance process (Element 4).
- **OFI-SWC-2024-11:** Ensure that all incident management procedures are updated to reflect the implementation of Camms (Element 6).

[270] 2023 12 1MS Steering Committee Agenda.
[271] 2023 12 14 1MS Steering Committee slide pack.
[272] 2024-25 Recycled Water Quality Improvement Plan Q3 August 2024.xlsx.
[273] 2024-25 Recycled Water Quality Improvement Plan Q3 August 2024.xlsx.
[274] JOG 2024 Q3 Item 7.4 RW Quality Update.

- **OFI-SWC-2024-12:** Use a single platform/process to track training and training requirements consistently across the business (Element 7).

2.2.3 Fluoridation Code (clause 4.3)

2.2.3.1 Fluoridation Code – Compliance with Requirements (sub-clause 4.3.1)

Sub-clause	Requirement	Compliance Grade
4.3.1	Sydney Water must comply with the Fluoridation Code and any requirements for fluoridation specified by NSW Health.	**Non-compliant (non-material)**

Risk if non-compliant

If Sydney Water does not fully comply with the requirements of the Fluoridation Code, there is a high risk that drinking water will not be correctly dosed with fluoride. There are two potential risks; firstly, if underdosed the dental health of the public may be compromised; and secondly, overdosing can have negative health effects on the public. Health limits on fluoride overdosing are set to prevent dental fluorosis after prolonged exposure; at higher levels skeletal fluorosis is a risk and at levels significantly higher concentrations than the health limit, acute health issues are possible.

Evidence sighted

Refer Appendix C (C.2.3).

Summary of audit findings/reasons for grade

A non-compliant (non-material) grade is assigned for the fact that the fluoride dosing pumps could be put into a manual mode indefinitely; the Code requires that any manual mode of this equipment automatically times out after 5 minutes. This led to an overdosing event at the Cascade WFP where a dosing pump in manual mode continued to operate while the WFP was not operational. However, Sydney Water has a number of other controls in place and in this event the WFP, including the clear water pumps, shutdown on high fluoride in the Clear Water Tank (CWT) and prevented water exceeding the health limit being supplied to customers. Therefore, although being non-compliant with the Code, it is considered to be non-material in relation to achieving the objectives of the *Operating Licence* and protecting public health. Although a required control failed, the provision of multiple barriers prevented out of specification drinking water reaching consumers.

The following points regarding day tank capacity, ventilation and using consistent procedures, were considered to be minor shortcomings.

The size of the day tank appears to be at least 500 L; a lesser size based on high- and low-level filling setpoints in SCADA appears to have been used when calculating capacity. Best practice is to use the physical capacity of the tank, from the outlet invert to the overflow invert. In addition, these setpoints are operator adjustable and not protected. It is possible for the operator to change the SCADA setpoints to the point that the day tank capacity is greater than that allowable under the Code. The day tank should not hold more than 36 hours of fluoride compound; this is to reduce the risk of an overdosing event by limiting the amount of chemical available.

The ventilation in the fluoride room appeared to be inadequate. The fan seemed undersized as well as not being acid resistant. There is no ventilation specification in the Code; however, the fan appears to be a domestic fan, which vents directly outside the building.

It was also noted that staff were not using a consistent Standard Operating Procedure (SOP) for the calibration of the metering pumps. A superseded process was being used, not

consistent with the current SOP. This contributed to the fluoride incident, as it was an outdated procedure that required the manual mode to be used, which did not time out. This has now been corrected, and operators have been trained in the current procedure.

Areas of good practice observed

Sydney Water has mostly been compliant with the Code and has been able to maintain a consistent dose of fluoride throughout the audit period. Fluoride has been dosed every day, except two days following the Cascade WFP incident.

Discussion and notes

The relevant sections of the New South Wales Code of Practice for Fluoridation of Public Water Supplies have been reviewed and the details are below.

4.1 New Applications to Fluoridate a Water Supply:

This section is concerned with the approval to fluoridate from NSW Health and notification of consumers. Approval was provided in April 1984; this area has been fluoridated for 40 years. The Instrument of Approval was provided as evidence.[275]

4.2 Fluoride Plant and Water Supply Upgrades:

4.2.1 Initial design risk control measures must not be degraded through subsequent modifications:

There were no modifications during the audit period.

4.2.2 Relevant staff of a water utility has an awareness of the key design risk control measures to prevent over and under dosing of fluoride:

The Instrument of Approval has been issued to Sydney Water.[276] It was observed to be displayed on the wall at the entrance of the Cascade WFP.

The Code of Practice is available online.

4.3 Permanent Cessation of Fluoridation of a Water Supply:

There have been no long-term stoppages of fluoridation, during the audit period.

5.1 General Design Criteria:

5.1.1 The design of the fluoridation plant shall ensure it can consistently achieve an overall accuracy of within ± 5% of the required fluoride target dose rate over the full water flow rate range approved by NSW Health:

Dosing is flow paced to the Clear Water Inlet Flow Rate (FTX5151) and is PID (Proportional-Integral-Derivative) controlled using feedback from the dosing flow meter (FTX7597) to control the pump speed.[277]

The target dose rate in the Instrument of Approval is 0.9 to 1.5 mg/L. Sydney Water targets approximately 1 mg/L. Sydney Water provided the daily fluoride monitoring and there were no results less than 0.9 mg/L or greater than 1.5 mg/L. In consideration of the data provided, the 5th percentile is 0.95 mg/L and the 95th percentile is 1.09 mg/L; this indicates that the results are consistently within the target in the Instrument of Approval. The results are slightly higher that 1.05 mg/L, which is 1.00 mg/L plus 5%. Sydney Water indicated that it runs the dosing slightly high to avoid going below the 0.9 mg/L limit. Although the range of results is slightly greater than the ± 5% desired regarding a single target dose, over a calendar year, Sydney Water complies with the operational range requirements detailed in section 10.1.1. of the Code.

[275] Fluoride Instrument of Approval.jpeg.
[276] Fluoride Instrument of Approval.jpeg.
[277] WT0041 Cascade Fluoride Dosing System FDS.pdf (Section 21.2.4).

Flow rate is determined by measuring the level of water in an open channel leading to the Clear Water Tank using an ultrasonic level sensor (FTX5151). This instrument, which is used to flow pace the dosing, has an accuracy of ± 2 mm.[278] During the site inspection, Sydney Water noted that it was going to replace the sensor due to potential inaccurate readings; this may help in achieving a more accurate dose.

OFI-SWC-2024-13: Reduce the range of the fluoride concentrations achieved in the drinking water to be ± 5% of 1.00 mg/L.

5.1.2 The design of the fluoridation plant shall ensure reliable automatic operation. That is, it must reliably stop and start with the water flow being dosed:

There are two interlocked flow measurement devices for fluoride dosing, the raw water flow meter (FTX2053) and the Clear Water Flow Meter (FTX5151). However, the Cascade Fluoride System Functional Design Specification (FDS)[277] states that "*Dosing starts only when both the "post dosing start/stop" signal and the "pre-dosing start/stop" from the main WFP startup/shutdown sequence are active. Dosing stops when either of these signals become inactive*". There is no detail in the FDS on these sequences. These meters are not included in FDS section 21.1 Equipment List or Section 21.8 Interlocks. The Clear Water Flow Meter (FTX5151) is only referenced in the FDS as being used for flow pacing. It is assumed that the "post dosing start/stop" signal and the "pre-dosing start/stop" are from the Raw Water Flow Meter (FTX2053) and Clear Water Flow Meter (FTX5151); this should be clear in the FDS.

OFI-SWC-2024-14: Clearly identify the source of the start/stop signals for the fluoride plant in the Functional Design Specification. The instruments should be in the Section 21.1 Equipment List and in Section 21.8 Interlocks.

Alarms and interlocks are in place for key equipment, sections 21.8 and 21.10 of the FDS[277] detail the interlocks and alarms respectively. The interlocks were also viewed on SCADA during the site inspection.

There is backflow prevention on the dilution water, as required by the Code. There are non-return valves (NRV7587 & NRV7591);[279] these were verified during the site inspection.

There was a CHAZOP (Control Hazard and Operability Study), which was undertaken when the fluoride plant was last upgraded in 2009.[280] This covers the Code requirement for a detailed risk assessment of the possible overdosing scenarios.

5.1.3 The design of the fluoridation plant shall minimise the risk of overdosing due to human error wherever possible:

The Code requires the capacity of the dosing equipment to be no greater than 110% of the prescribed dose at plant maximum flow rate. Sydney Water undertook an assessment of all plants and provided this to NSW Health in 2018. The calculation works out the percentage of the prescribed dose of 1.00 mg/L, although strictly compliant with the Code, it would be more risk adverse to calculate it on the operational dose. The operational setpoint for the Cascade WFP at the time of the plant inspection was 0.75 mg/L, not 1.00 mg/L. This is due to the contribution of background fluoride and dilution water being treated fluoridated water. Sydney Water's calculation states a maximum dose of 92.8%, however it would be 124% if the operation setpoint was used. This would seem to unnecessarily increase the risk of overdosing, especially considering the calculations use the WFP design capacity of 50 ML/day and the assessed capacity is 37 ML/day.[281]

[278] Endress-Hauser_Prosonic_S_FMU90_EN.pdf.
[279] WT0041 P7527-1.pdf.
[280] CHAZOP Report Fluoride Working Sheet.
[281] Cascade WFP - briefing paper - annual WFP risk assessment 2024.pdf.

OFI-SWC-2024-15: Calculate the maximum capacity of fluoride dosing at all plants using the operational setpoint rather than the prescribed dose. If any dosing systems have a capacity of greater than 110% of the operational target dose at maximum plant flowrate, consideration should be given to restricting capacity.

The Cascade WFP metering pumps (PMP7570 & PMP7571) are model PROMUS117BPVT706XO1EO,[282] which have a maximum capacity of 10.7 L/hr according to the pump tag.[283] The previous calculation is based on a maximum pump capacity of 10.2 L/hr. However, using the increased dose rate, the maximum dose still does not exceed 1.00 mg/L.

The Code requires that no component of the fluoride feeding or controlling equipment can be manually plugged into a standard power outlet. It was confirmed that this was not the case at the Cascade WFP.

Section 5.1.3.2 requires that equipment in the chemical feed system shall not be permitted to be put into permanent manual mode, operation requiring operation intervention, such as a spring-loaded switch. Manual modes via a PLC or SCADA should have a hardcoded limit of 5 minutes.

The incident that occurred at the Cascade WFP on 14 June 2024 was due to the fluoride plant being left in manual mode after calibration of the dosing pumps. The arcane arbiter function within SCADA allows pumps to be put into continuous operation. This includes the fluoride dosing pumps. The fluoride pump continued to operate in this instance even after the WFP had stopped, it also ignores all fluoride plant and WFP interlocks. The issue was only identified when the WFP shutdown on a high fluoride reading on the fluoride meter, which also sent an alarm to the operator.

Sydney Water confirmed that the arbiter manual mode function has since been disabled at Cascade WFP fluoride and will be removed at all plants for all chemical dosing pumps.

It was noted during the Cascade plant inspection that the fluoride meter on the Clear Water Tank can be placed into "SIM mode"[284] from SCADA for an hour. Although not part of the chemical feed equipment, it is only used for monitoring and alarming functionality.

Manual operation of the pumps is not available at the device level. Manual operation of the dosing sequence is available and has a 5-minute maximum timer. SIM mode is timed and times out after a period.

REC-SWC-2024-04: Ensure that fluoride dosing pumps cannot be left in manual operation for greater than 5 minutes. Check all fluoride dosing plants to ensure that the arbiter manual function has been disabled, other manual modes in SCADA/PLC time out after 5 minutes and that any manual mode at the device level requires continuous operator intervention to operate.

OFI-SWC-2024-16: Reduce fluoride online meter SIM mode timeout to 5 minutes at all plants. If a higher time period is required, this should be discussed with NSW Health.

5.1.4 The design of the fluoridation plant shall provide plant operational staff with all that is required to measure and control the fluoridation process (and equipment) accurately and consistently in a timely manner:

The dosed water flow is continuously measured/logged by the PLC/SCADA system; the treated water over 24 hours is calculated from this measurement at 8:00 am each day.[285]

The usage of fluoride is measured by load cells (WTX7560) on the day tank and Fluoride Dosing Flowmeter (FTX7597). The daily consumption of hydrofluorosilicic acid is recorded

[282] Fluoride dosing and flow metering.pdf.
[283] Pump capacity picture.pdf.
[284] Simulation mode under which a constant setting is locked in and simulated for an hour.
[285] Screenshot daily report from SCADA for 24 hour average dose.png.

using the flow meter (FTX7597) and is used to calculate the average 24 hour dose.[286] This is a magnetic flow meter and is considered to be accurate. It was mentioned on site that the meter's orifice is small and occasionally becomes blocked with acid crystals and requires cleaning.

The code requires that *all necessary local indicators shall be provided.* The following indicators were observed onsite:

- Bulk Storage Tank level;
- Bulk Storage Tank high level audible alarm and flashing light;
- Day Tank Level;
- Hydrofluorosilicic acid dosing flow rate;
- Hydrofluorosilicic acid dosing pressure;
- Carrier water pressure.

There also was no local Human Machine Interface (HMI) that could display readings of meters and the status of all equipment; provision of an HMI would be an improvement. During the site inspection, the operator indicated that SCADA is used to control and assess the status of the plant. Sydney Water has taken a decision to remove HMIs and use SCADA.

OFI-SWC-2024-17: Provide an HMI externally to the Fluoride Room, within sight of the plant.

5.1.5 The design of the fluoridation plant shall provide a safe working environment and facilitate safe working practices to protect both plant operations staff and the public:

Separate electrical control cubicles

The Cascade fluoridation plant is unusual in that there is no separate control room. Electrical equipment is within the Fluoride Room and the fluoride plant is controlled from the WFP Control Room using SCADA. The design would appear to be unusual, although access to the Fluoride Room is limited through the use of SCADA for control.

Another consideration is to reduce potential corrosion of equipment. Although not likely to reduce the performance of the fluoride plant or the safety of operators, it may reduce the reliability of the plant.

Physical layout of the equipment

The equipment appeared to be laid out in a way that provided clear access for operators. This was observed during the site visit.

Management of acid fumes

The Bulk Storage Tank and Day Tank both vent to the atmosphere.

The Bulk Storage Tank overflow is to the bund, no trap. The Day Tank overflow has a water trap with a float to top-up water.

The calibration tube vents to the Day Tank.

There is a small fan located in the Fluoride Room, directly opposite the door, that facilitates the removal of fumes. This fan operates continually; however, the fan appears to be a standard domestic extractor fan and not acid resistant. The fan would appear to be undercapacity to significantly manage fumes if there were a spill within the room. While there are no specifications for fan performance in the Code, Sydney Water is required to provide a safe working environment. In this instance, although there is ventilation in place, there is

[286] Screenshot SCADA snapshot 24 hours average dose.

insufficient evidence to determine if it is adequate. This includes appropriate ventilation and provision of PPE.

Furthermore, electrical control boxes located within the fluoride room may be susceptible to accelerated/undue deterioration if ventilation is inadequate.

REC-SWC-2024-05: Evaluate the fans installed in fluoride rooms and ensure they are acid resistant and have the capacity to protect equipment from fumes and provide a safe working environment.

OFI-SWC-2024-18: Remove electrical control boxes and equipment such as flow meter control boxes from inside fluoride rooms.

Easy Cleaning

No issues were identified in relation to the ability to clean and hose down lower walls.

Restricted Access

The Fluoride Room is locked, and only trained operators have access.

Safety Signage

Appropriate signage was observed during the site inspections in regard to the chemical being stored. It would be an improvement to include the PPE requirements for entry to the Fluoride Room at the entrance.

OFI-SWC-2024-19: Place a sign at the entrance to the Fluoride Rooms identifying the PPE required to enter.

Spills contained

Spills of fluoride material is captured in bunds and would be removed via waste contractor if required. Spills from the Chemical Room and Chemical Unloading Area (can also be pumped to the Washwater Tank directly) are captured in the Chemical Sump. The Chemical Sump can be manually pumped to the Washwater Tank or a truck depending on the situation.[287,288] Stormwater captured in bunds is released to the Stormwater Settling Basin and on to Middle Dam, this is closed during tanker unloading.

5.1.6 The design of the plant shall minimise the risk of fluoridating agents escaping to the environment:

There is adequate bunding of both the Bulk Storage Tank and Day Tank. There is a facility to pump out the bulk storage bund. The Day Tank bund drains directly to the tanker unloading area sump.

The dosing line is doubled sleeved to the dosing point.

The unloading area is concrete with a sump to manage any spills. This drains to the WFP Chemical Waste Tank, which discharges to the Cascade Middle Dam.

It was noted that areas in the Fluoride Room, walls and floors, as well are the tanker unloading area were exposed concrete or cement and brick. These would potentially corrode if they came into contact with a reasonable spill of acid.

OFI-SWC-2024-20: Epoxy coat any areas in the Fluoride Room that may be splashed with hydrofluosilicic acid and the tanker unloading area.

Spills and leaks are managed in accordance with the site-specific incident response.[289]

[287] Picture of Chemical Unloading Bay layout at Cascade WFP.pdf.
[288] WTCS5017 Cascade WFP- Discharging water to the environment.pdf.
[289] D0001222.28 Cascade WFP Incident Response Manual.pdf.

5.1.7 The fluoridation plant complies with all legislative requirements:

There were no issues identified during the site inspection. An assessment would have been completed during the design of the plant and any subsequent upgrades. It would be beneficial to keep these and have them accessible, ensuring ongoing compliance. Regulatory compliance is also covered under Operating Licence clause 4.1.3 in terms of drinking water quality management.

5.2.4 Hydrofluosilicic acid dosing systems:

Components of dosing system

The following components are required by the Code and were all identified during the site visit:

- bulk storage tank;
- day tank;
- weighing platform for the day tank;
- graduated calibration tube;
- metering pump with pressure relief diaphragm pressure gauge;
- backpressure / anti-siphon valve on the delivery side of the pump;
- potable or filtered dilution water source if dilution is needed.

Day tank requirements

The daily fluoride transfer is an operator initiated pumped system.

This involves starting the acid transfer pump (PMP7541) and opening the bulk tank outlet valve (VLV7545). When the level in the day tank reaches the transfer cut-out setpoint, the transfer pump is stopped, and the bulk storage tank outlet valve is closed automatically using a motorised valve.

If the day tank reaches the high-level switch during transfer, an alarm is raised and the transfer is terminated. The transfer is also terminated if it is not completed within a pre-set time (maximum time 20 minutes) as set by the operator and an alarm is raised.

The day tank (TKN7546) physical capacity is 500 L; it is noted in a response to NSW Health[290] that the operating capacity is stated as 300 L, and that this equates to 29-hour storage. Section 21.5 of the Functional Specification[291] states the Day Tank has a capacity of 500 L and the volumes presented by Sydney Water are based on operator adjustable setpoints for the high and low levels in the tank in SCADA. The tank capacity should be based on the volume contained in the tank from the outlet invert to the overflow invert. If this capacity were taken into consideration, the Day Tank will be well in excess of 36 hours of fluoride. This is considered a shortcoming as there is already a limit on capacity, although it is not resistant to human error. Also, this is one barrier to limit dosing capacity and overdosing; others, such as restricting pump dose rate, are also in place.

REC-SWC-2024-06: The capacity of fluoride day tanks should not exceed the volume of chemical required for 36 hours of fluoride dosing to the target dose at maximum plant flow. Ensure that the capacity of day tanks at all WFPs are not in excess of this volume and cannot be adjusted to exceed it.

It was noted that the day tank transfers are not adjusted based on WFP demand. The transfer amount provides 36 hours of fluoride dosing at maximum plant capacity. At the time of the inspection the WFP was only producing 8.5 ML/day of water, and the plant has a capacity of 50 ML/day. The Day Tank fill level is not an operator adjustable value, but if it were the amount transferred could be adjusted based on demand. This will further reduce the risk of an overdose.

OFI-SWC-2024-21: Adjust the amount of fluoride transferred to Day Tanks based on demand. This will reduce the risk of an overdose event.

Diaphragm pressure gauge and back pressure/anti siphon valve

Both were identified to be in place during the site visit, as well as a pulsation dampener.

There is a motorised valve (VLV7565) on the outlet of the Day Tank[292] that is interlocked with the dosing pumps.

Flush Points

Flush points are provided before and after the metering pumps.[293] This was validated onsite.

Venting

No indoor tanks vented within the Fluoride Room. Everything within the room vented back to the Day Tanks. The Day Tank itself is vented outside.

5.2.5 Fluoride Dosing Pipework:

All pipework is correctly coloured (Magenta P11 as per AS 2700S) and marked with the contents, hydrofluorosilicic acid and the direction of flow.

6.1.1 The water utility shall provide a safe working environment and safe working practices for both plant operators and untrained staff/public:

The Code specifies that a water utility should undertake the following to provide a safe workplace:

- A site-specific risk assessment on the design and operation of the fluoride plant:
  - A CHAZOP for the Cascade plant has been undertaken.[294]
- Control the access to the fluoride plant:
  - The Fluoride Room is locked and only accessible by trained operators.
- Standard Operating Procedures (SOP) are in place, and include safety requirements:
  - SOPs are in place and contain OH&S requirements and hazard identification and generic risk assessment.[295,296]
- Operators adequately trained and Material Safety Data Sheets (MSDS) are available:
  - The MSDS was observed in the Fluoride Room at the time of the inspection.
  - NSW Health training certificates were provided for five Production Officers.[297,298]
- Safe work atmosphere:
  - Ventilation and the fan were discussed above as being inadequate.
- Appropriate PPE in place:
  - SOPs identify the required PPE.
  - Operators have dedicated safety PPE including safety goggles and Calcium Gluconate Gel on site.

[290] CoP 5.2.4.2 WFP Fluoride Transfer system sent to NSW Health June 2018.pdf.
[291] WT0041 Cascade Fluoride Dosing System FDS.
[292] WT0041 P7527-1.
[293] WT0041 P7527-1.
[294] CHAZOP Report Fluoride Working Sheet.
[295] D0001375 Bulk Chemical Delivery WWH.
[296] D0001378 Calib Chem Dosing Pumps.
[297] Fluoride certificates David B, Yuva U , Bill W, Heath B.
[298] Fluoride certificates Jeffrey M.

- Monthly PPE safety check in place and weekly safety check on eyewash/shower.[299]

7.1.1 The environment is protected from impact due to the fluoridation plant:

The Code specifies a water utility should undertake the following to protect the environment:

- Site-specific environmental hazard risk assessment:
  - The Cascade environmental risk assessment includes chemical spills to the environment and controls.[300]
  - The CHAZOP also includes a review of the risk of spills.[301]
- Designed to manage spills:
  - All the fluoride equipment is within bunds and pipework outside of the bunds is double skinned.
  - The Incident Response Manual[302] includes chemical spill responses.
  - The loading area is paved and drains to the Chemical Waste Tank.
- Control the access to the fluoride plant:
  - The Fluoride Room is locked and only accessible by trained operators.
- Documental environmental waste plan:
  - There is no documented waste management plan for fluoridated waste.
  - The Incident Response Manual does not include any specific information on managing hydrofluorosilicic acid.
  - It was stated in the interviews that waste would be disposed of using a licenced waste management company.
- SOPs include environmental control requirements:
  - SOPs contain details on relevant environmental controls.[303,304]

8.1.1 Procurement of Fluoridating Agent:

Sydney Water has an approved list of chemicals[305] to use in the drinking water including Hydrofluosilicic Acid. Sydney Water developed detailed technical specifications for each chemical used in drinking water and requires the chemicals supplier to carry out independent laboratory analysis for all contaminants regularly and provide contaminant analysis reports to Sydney Water to ensure that the chemicals meet Sydney Water's technical specifications.[306]

There is a procedure for receiving bulk chemicals, including fluoride.[307]

8.2.1 Should not run out of fluoridating agent:

NSW Health has granted Sydney Water an exemption to this requirement. The chemical supplier stores a 3-month supply of fluoridating agent onsite at its factory. A letter was provided as evidence whereby Sydney Water requested the exemption.[308]

[299] WTCS5012.03 Cascade WFP Monthly Safety Inspection Checklist 18 April 24.pdf.
[300] Cascade Environmental Risk Assessment.
[301] CHAZOP Report Fluoride Working Sheet.
[302] D0001222.28 Cascade WFP Incident Response Manual.
[303] D0001375 Bulk Chemical Delivery WWH.
[304] D0001378 Calib Chem Dosing Pumps.
[305] D0000643 Approved List of Chemicals in Sydney Water and Change Management Process.
[306] Fluoride analysis report -NRA 4461 240724 FSA Sydney water IPL 4010331.
[307] WT5232 Quality Assurance for Receiving Bulk Chemicals Used in Drinking Water Treatment.
[308] 2018-BW011 Storage of fluoridating agent at Sydney Water Filtration Plants.

Sydney Water has an established contract with Incitec Pivot Limited (IPL)[309] and Axieo Operations Pty Limited (now DKSH).[310] As per contract, Schedule 2 GS-04, the supplier provides business continuity and an emergency response plan.

As per contract GS 04.1 Business Continuity Plan and GS 04.2 Security of supply, each supplier of fluoride chemical ensures the continuity and security of supply, so that there is no loss of supply of fluoride. Low level in SCADA on the bulk tank will trigger an alarm to reorder chemicals.[311]

In addition, Sydney Water maintains an independent contract with these two suppliers so that in the event of any unforeseen issue from one supplier, supply of fluoride chemicals to Water Filtration Plants will be maintained by the second supplier.

8.2.2 Appropriate storage:

Hydrofluorosilicic acid is stored appropriately and away from other chemicals.

9.1.1 A representative sample of treated water that directly reflects the real-time dosing performance of the fluoridation plant shall be available at all times:

There is an online fluoride meter (ATX7552) on the Clear Water Tank and a grab sample point at the same location. This does not seem to be ideal as the Clear Water Tank is a reasonable size and buffers the real-time dosing performance. Ideally, there would be a sample point prior to the Clear Water Tank; however, this is constrained and there does not appear to be a location where fluoride could be dosed, and a representative sample taken prior to the Clear Water Tank. Fluoride could be dosed after the Clear Water Tank; however, this would potentially increase the risk to customers that are supplied prior to the treated water reservoirs as there would be no buffering.

OFI-SWC-2024-22: Investigate if there is a possibility of moving the fluoride dosing point and/or monitoring point so that monitoring is representative of the real-time fluoride dosing performance and not buffered by the Clear Water Tank at Cascade WFP.

9.2.1 A reliable method for determining fluoride concentration in the treated water shall be provided at all times:

- Bench area:
  - The Cascade WFP has a dedicated laboratory for water testing.
- Ion Selective electrode analyser:
  - A benchtop ISE instrument used to check fluoride concentrations is used and calibrated daily.[312]
  - Online instrument is calibrated annually by an external service provider.[313]
  - A work instruction has been developed for monitoring fluoride.[314]

9.2.2 The calibration standards are accurate, the quality of the total ionic strength adjuster and electrode filling solutions and the operation of the fluoride meter are reliable:

- A benchtop ISE instrument used to check fluoride concentrations is used daily and calibrated daily.[315]
- Online instrument is calibrated annually by an external service provider.[316]

[309] Contract 28329 HFSA with Incitec Schedules F and G.pdf.
[310] Contract 28331 HFSA with DKSH Schedules F and G.pdf.
[311] Screenshot Fluoride low level setpoint to reorder.png.
[312] WTCS5012.01 Cascade daily lab records 4 December 2023 for Fluoride.pdf.
[313] External Fluoride Calibration – Fluoride_Monitor_Test_Report Cascade WFP 07082023.
[314] WT5127 IMS – Laboratory Determination of Fluoride using Orion 720Aplus and Dual Star pH/ISE Meters.
[315] WTCS5012.01 Cascade daily lab records 4 December 2023 for Fluoride.pdf.
[316] External Fluoride Calibration – Fluoride_Monitor_Test_Report Cascade WFP 07082023.

- Weekly duplicate samples from the WFP are tested onsite and also at the West Ryde laboratory and the results are compared.[317]
- Calibration standards and ionic strength buffer were reviewed in the Cascade WFP onsite laboratory.

9.2.3 All staff use the same calibration procedures:

- A benchtop ISE instrument used to check fluoride concentrations is used daily and calibrated daily.[318]
- Online instrument is calibrated annually by an external service provider.[319]
- The work instruction for operating the benchtop analyser includes the calibration procedure.[320]

9.2.4 Potential for incorrect results due to temperature difference between standards and the treated water sample:

The fluoride standards used for calibration are in a water bath containing a stream of treated water, ensuring they are at the same temperature as the treated water sample.

10.1.1 Consistent fluoride concentration in the distribution system:

The Code specifies a target of 1.00 mg/L and that 95% of samples are within a range of 0.90 and 1.50 mg/L. The average daily result at the plant was 1.01 mg/L and there were no instances where the concentration was outside of the 0.90 to 1.50 mg/L range.[321]
Sydney Water advised that it received an exemption from reporting on 16 and 17 June 2024 due to the fluoride incident. Fluoride was not operational on 16 June and only recommenced on 17 June and it is considered that fluoride would have been less than 0.90 mg/L on these days. However, even if these samples were considered, Sydney Water would still have achieved 95% compliance with the target.

Alarm setpoints (SCADA screenshot):[322]

- High level alarm setpoint – 1.2 mg/L.
- Low level alarm setpoint – 0.9 mg/L.

10.2.1 Routine operating requirements:

- Daily plant inspections:
  - The plant is inspected daily and observations are recorded.[323]
  - This was also observed during the inspection of the Cascade WFP.
- Daily records include the following:[324,325,326,327]
  - Volume of water treated.
  - Volume of fluoride used.
  - Average calculated dose of fluoride.
  - Daily grab samples at the plant and from the Blackheath and Katoomba Reservoirs, as well as a reading from the online instrument.

[317] Fluoride Comparison.
[318] WTCS5012.01 Cascade daily lab records 4 December 2023 for Fluoride.pdf.
[319] External Fluoride Calibration – Fluoride_Monitor_Test_Report Cascade WFP 07082023.
[320] WT5127 IMS – Laboratory Determination of Fluoride using Orion 720Aplus and Dual Star pH/ISE Meters.
[321] 2023 -24 Cascade Fluoride Compliance Grab and 8am result.
[322] Screenshot Fluoride alarm high and low level setpoint.png.
[323] Cascade Fluoride Daily Inspection Log – December 2023.pdf.
[324] Screenshot daily report from SCADA for 24 hours average dose.
[325] WTCS5012.01 Cascade Daily Lab Records 4 December 2023 for fluoride.
[326] Daily SCADA printout, daily run times and chemical consumption – 18/9/2024.
[327] 2023-24 Cascade Fluoride Compliance Grab and 8am results.

- Stock of fluoride in the Day Tank and Bulk Storage Tank.

- Reliably maintained:
  - The plant is inspected daily and observations are recorded.[328]
  - Maintenance on dosing pumps.[329]
  - Weekly drop tests on dosing pumps.[330]

10.2.2 Fluoride reaching consumers should match the target:

The Code requires that two weekly samples are collected and analysed in the reticulation that are well separated. Duplicate samples are sampled and tested by the Sydney Water Laboratory in the reticulation.[331]

The Code also requires a monthly duplicate to be sent to the NSW Forensic and Analytical Science Service for comparison. Weekly duplicate WFP treated water fluoride sample testing is completed to compare fluoride test results between the WFP's laboratory and Sydney Water's NATA certified West Ryde Laboratory, for both the WFP's bench top and online analyser. These results are then compared using SCADA Central.[332] It was discussed in the interview that approval with NSW Health not to send a comparison sample to the NSW Health Laboratory is only verbal. No written evidence of the exemption was available at the time of the audit.

OFI-SWC-2024-23: Gain written approval from NSW Health regarding sending a monthly duplicate to the NSW Forensic and Analytical Science Service for comparison.

10.2.3 Staff at the plant use the same procedures:

The fluoride incident at the Cascade WFP was due to an old SOP being followed for the calibration of the metering pumps. This old procedure used the functions in the pump arbiter. Even though this was a non-compliance with the ability to leave the pump in manual mode, it could potentially have also been avoided if operators were all using the most recent calibration procedure.

Evidence has been provided that operators have all been trained in the implementation of the new calibration procedure.[333] A training register has also been provided for the Bulk Chemical Delivery (D0001375) and Quality assurance for receiving bulk chemicals used in drinking water treatment (WT5232).[334]

No recommendation has been made in respect of this non-compliance, as it has already been rectified.

10.2.4 The fluoridation plant should be operated by qualified persons:

All operators are trained in accordance with the requirement of the Fluoride Code of Practice.[335] Sydney Water has provided certificates of training for five operators; the Code requires at least two.

The Fluoride Room is locked, and only trained operators have access.

10.3.1 Emergency response requirements:

Appendix 1 of the *Drinking Water Quality Event Management Plan* includes a generic flowchart to follow for all fluoride overdosing events. The Code discusses how planning and understanding

[328] Cascade Fluoride Daily Inspection Log – December 2023.pdf.
[329] 6b - Cascade - BM CM PM WO Report - FY 23-24.
[330] D0001378 Calib Chem Dosing Pumps and Drop test results Fluoride Cascade 23_24.xlsx.
[331] 2023-24 Cascade Fluoride Compliance Grab and 8am results.
[332] Fluoride Comparison.
[333] Calibration of Chemical Dosing (Drop Test) Training Attendance Aug 2024.
[334] Bulk Chemical Delivery Training Attendance Aug 2024.
[335] Fluoride certificates David B, Yuva U, Bill W, Heath B.pdf & Fluoride certificates Jeffrey M.

the distribution system and storages can help manage events regarding flushing and dilution. It would suggest that a more site-specific consideration should be given.

The DWQMP contains CCPs; fluoride is CCP 3 and has a critical limit of 1.5 mg/L and will shut the fluoride plant down.[336]

OFI-SWC-2024-24: Undertake a review of WFPs that fluoridate and plan how a fluoride overdose would be isolated and flushed or diluted to bring levels down to the target level. Include strategies for each plant in the *Drinking Water Quality Event Management Plan*.

11.1.1 Routine communication with NSW Health:

Effective communication was maintained with NSW Health during the audit period, as required under the Code.

There was one fluoride incident where the Fluoride CCP at the Cascade WFP was triggered by the detection of fluoride in excess of the health limit of 1.5 mg/L in the Clear Water Tank. This was supplied to the distribution system for approximately 45 minutes. Water was predominantly pumped to reservoirs in the distribution system where it was diluted, and no results were recorded over 1.5 mg/L. There are, however, some customers that receive water off the Catalina Reservoir Rising main. This was flushed and monitoring indicated that water was not supplied in excess of the health limit.[337]

Notification to NSW Health was undertaken in accordance with the requirements of the Code. Verbal notification was followed up with email, providing evidence that notification was made.[338] It was noted that there was no specific record of the notification in the SITREP or incident record.

OFI-SWC-2024-25: Make a record of contact with NSW Health of events and incidents. Consider recording who made the call, who was spoken to, the date and time and what was discussed.

11.1.2 Routine data provided to the NSW Health:

Sydney Water provides a monthly and quarterly report to NSW Health[339]

The Code requires that data is entered into the NSW Health Water Database of submitted in hardcopy on Form 4. The information is sent but not in the format specified in the Code.

OFI-SWC-2024-26: Enter monthly fluoride data reported to the NSW Health into the Water Database. Otherwise, seek an exemption to supply it electronically.

11.1.3 Exception reports:

In the Cascade WFP fluoride event, NSW Health received an email to follow up on the verbal notifications on the day the incident was identified.[340]

Details of incident were entered into the Sydney Water ECC profile, and this generated SITREPs that go out to external agencies, including NSW Health. However, the SITREPs for this incident are both blank in terms of the external agencies that were included on the distribution list.[341,342]

OFI-SWC-2024-27: Ensure the SITREP form includes all of the required information to notify and create a reliable record of the incident. This would include details of notifications to external agencies.

[336] IMS0152.01 - Drinking Water Product Specification.
[337] Cascade WFP Fluoride Overdose 150624_final.
[338] Email: Cascade WFP Fluoride Incident.
[339] Q4 2023 -24 Quarterly Drinking Water Quality Report to NSW Health Final2.pdf.
[340] Email: Cascade WFP Fluoride Incident.
[341] 15 Jun 2024 AEST_ - SITREP 0001.
[342] 15 Jun 2024 AEST_ - SITREP 0002.

12.1.1 Training Requirements:

All operators are trained in accordance with NSW Health requirements.[343,344]

13.1.1 Appropriate records are maintained:

From undertaking the audit, it was evident that Sydney Water had maintained appropriate records.

14.1.1 Audits:

Sydney Water undertakes detailed audits of the water fluoridation facilities. During the audit period, the following internal audits were undertaken:

- Illawarra WFP.[345]
- Nepean WFP.[346]
- Woronora WFP.[347]

Recommendations

The following recommendations are made in respect of this obligation:

- **REC-SWC-2024-04:** By 30 June 2025, ensure that fluoride dosing pumps cannot be left in manual operation for greater than 5 minutes. Check all fluoride dosing plants to ensure that the arbiter manual function has been disabled, other manual modes in SCADA/PLC time out after 5 minutes and that any manual mode at the device level requires continuous operator intervention to operate.
- **REC-SWC-2024-05:** By 30 June 2025, evaluate if the fans installed in fluoride rooms and ensure they are acid resistant and have the capacity to protect equipment from fumes and provide a safe working environment.
- **REC-SWC-2024-06:** The capacity of fluoride day tanks should not exceed the volume of chemical required for 36 hours of fluoride dosing to the target dose at maximum plant flow. By 30 June 2025, ensure that the capacity of day tanks at all WFPs are not in excess of this volume and cannot be adjusted to exceed it.

Opportunities for improvement

The following opportunities for improvement have been identified in respect of this obligation:

- **OFI-SWC-2024-13:** Reduce the range of the fluoride concentrations achieved in the drinking water to be ± 5% of 1.00 mg/L.
- **OFI-SWC-2024-14:** Clearly identify the source of the start/stop signals for the fluoride plant in the Functional Design Specification. The instruments should be in the Section 21.1 Equipment List and in Section 21.8 Interlocks.
- **OFI-SWC-2024-15:** Calculate the maximum capacity of fluoride dosing at all plants using the operational setpoint rather than the prescribed dose. If any dosing systems have a capacity of greater than 110% of the operational target dose at maximum plant flowrate, consideration should be given to restricting capacity.
- **OFI-SWC-2024-16:** Reduce fluoride online meter SIM mode timeout to 5 minutes at all plants. If a higher time period is required, this should be discussed with NSW Health.

[343] Fluoride certificates Jeffrey M.
[344] Fluoride certificates David B, Yuva U, Bill W, Heath B.
[345] SWC Illawarra WTP_Fluoride Audit_2023 V5.
[346] SWC Nepean WFP_Fluoride Audit_2023 V5.
[347] SWC Woronora WTP_Fluoride Audit_2023 V5.

- **OFI-SWC-2024-17:** Provide an HMI externally to the Fluoride Room, within sight of the plant.
- **OFI-SWC-2024-18:** Remove electrical control boxes and equipment such as flow meter control boxes from inside fluoride rooms.
- **OFI-SWC-2024-19:** Place a sign at the entrance to the Fluoride Rooms identifying the PPE required to enter.
- **OFI-SWC-2024-20:** Epoxy coat any areas in the Fluoride Room that may be splashed with hydrofluosilicic acid and the tanker unloading area.
- **OFI-SWC-2024-21:** Adjust the amount of fluoride transferred to Day Tanks based on demand. This will reduce the risk of an overdose event.
- **OFI-SWC-2024-22:** Investigate if there is a possibility of moving the fluoride dosing point and/or monitoring point so that monitoring is representative of the real-time fluoride dosing performance and not buffered by the Clear Water Tank at Cascade WFP.
- **OFI-SWC-2024-23:** Gain written approval from NSW Health regarding sending a monthly duplicate to the NSW Forensic and Analytical Science Service for comparison.
- **OFI-SWC-2024-24:** Undertake a review of WFPs that fluoridate and plan how a fluoride overdose would be isolated and flushed or diluted to bring levels down to the target level. Include strategies for each plant in the *Drinking Water Quality Event Management Plan*.
- **OFI-SWC-2024-25:** Make a record of contact with NSW Health of events and incidents. Consider recording who made the call, who was spoken to, the date and time and what was discussed.
- **OFI-SWC-2024-26:** Enter monthly fluoride data reported to the NSW Health into the Water Database. Otherwise, seek an exemption to supply it electronically.
- **OFI-SWC-2024-27:** Ensure the SITREP form includes all of the required information to notify and create a reliable record of the incident. This would include details of notifications to external agencies.

2.3 Performance Standards for Service Interruptions (Licence Part 5)

2.3.1 Water Continuity Standard (clause 5.1)

2.3.1.1 Water Continuity Standard – Compliance with Standard (sub-clause 5.1.1)

Sub-clause	Requirement	Compliance Grade
5.1.1	Sydney Water must ensure that, in each financial year, at least 9,800 Properties per 10,000 Properties (in respect of which Sydney Water provides a Drinking Water supply service) receive a Drinking Water supply service unaffected by an Unplanned Water Interruption (the **Water Continuity Standard**). ***Note:*** ***Unplanned Water Interruption*** *is an event where, in relation to a Property:* *a) the supply of Drinking Water at the first cold water tap of a Property is interrupted without the Customer or Consumer having received prior notice of that interruption from Sydney Water; and* *b) it takes more than five continuous hours for normal supply of Drinking Water to be restored to the Property.*	 **Compliant**

Risk if non-compliant

Failure to comply with Water Continuity Standard by adequately minimising the number of Unplanned Water Interruptions would indicate that Sydney Water has failed to maintain an adequate level of service, thereby presenting a potential high risk to public health.

Evidence sighted

Refer Appendix C (C.2.4).

Summary of audit findings/reasons for grade

Sydney Water complied with the Water Continuity Standard in that 9,827 (compared to the permitted 9,800) per 10,000 properties were unaffected by an Unplanned Water Interruption during the 2023/24 financial year. Sydney Water also demonstrated that it implements robust processes to capture and, to the extent necessary, analyse the relevant data in determining its performance against the Standard, consistent with the definitions and exclusions set out in the *Operating Licence*.

Accordingly, Sydney Water is assessed to have been compliant with this obligation.

Areas of good practice observed

Although action was initially taken in response to a recommendation (No: 2020-18) arising from the 2019/20 Operational Audit, Sydney Water has subsequently taken proactive action in response to larger water continuity incidents that occurred in the period from September to December 2022. As outlined in the discussion below, a review of the implementation of a Water Continuity Incident Action Plan, conducted during the current audit period, has led to the establishment of a Water Continuity Working Group (to implement recommendations) and a Water Continuity Heads of Business Focus Group to provide oversight.

In addition to the improvements arising from this proactive activity, the cross-business engagement at both Working Group and Focus Group levels is considered a positive approach (compared to an observed past tendency for operating in 'silos'), which is commended.

Discussion and notes

Sydney Water reported that during the 2023/24 financial year, 9,827 per 10,000 properties were unaffected by an Unplanned Water Interruption.[348] This compares favourably to the permitted maximum of 9,800 per 10,000 properties; on this basis, Sydney Water complied with the Water Continuity Standard during the audit period.

Sydney Water advised that:

> "*Properties are determined to have experienced an unplanned water interruption either automatically (utilising data received from the field) and/or by exception (after investigation). The total number of properties affected by an unplanned interruption is monitored daily in the Power BI platform to ensure situational awareness, with a monthly trend summary provided by the Operational Performance and Data Insights (OPDI) Team via a Power BI report.*"

In the majority of cases, the number of properties experiencing unplanned water interruptions is derived from data recorded by field crews when undertaking repair works. The affected section of water main and the time for which it was isolated are captured in work order records; the number of properties impacted are then automatically determined by Sydney Water's GIS, which is used to identify properties that have a service connection to the isolated section of main.

Identification of properties that have experienced an unplanned interruption 'by exception' may be prompted by (for example) a complaint, if field data was not collected, or to verify field recorded data; such properties may be indirectly affected (i.e. they lie outside the isolation zone but are impacted by the shutdown). In these cases, a desktop hydraulic assessment, which uses data available from IICATS (telemetry system), customer contacts and job history, is undertaken to identify affected properties; specific scenarios include:

- Main break depressurising the surrounding network (single and multiple interruptions periods reported).
- Main break on a main with a large downstream customer base.
- Temporary supply provided to customers.
- Multiple main breaks (various scenarios).

The processes used to identify the number of properties that have experienced unplanned interruptions of more than 5 hours duration are documented in procedures including:

- *Performance Indicator Sheet – Water Continuity Standard*[349] – which replicates the relevant *Operating Licence* definitions and outlines the process for extracting relevant data from Sydney Water's business systems (including data sources and query details).
- *Unplanned Water Discontinuity Rebate*[350] – which provides guidance for identifying properties affected by an unplanned water interruption where the affected properties haven't been identified/processed by the field crew.

[348] Sydney Water, *Operating Licence 2019-23; Performance Standards for Service Interruptions Report 2023-24*, undated.
[349] Sydney Water, *Performance Indicator Sheet; PS 1 - Water Continuity Standard OL 5.1.1 - Number of properties that experience an unplanned water interruption exceeding 5 hours* (Version 1), 1 August 2024 (file: *1. PS -1 Water Continuity Standard FY23-24.docx*).
[350] Sydney Water, *Work Instruction; Unplanned Water Discontinuity Rebate* (Version 1), 1 December 2022 (file: *8. D0002142.01 Unplanned Discontinuity Water Rebate.pdf*).

- *Assessing Water Service Interruptions*[351] – which provides guidance for undertaking desktop hydraulic assessments to determine the number of properties affected by an unplanned water outage.

Other supporting guidance is also available, including (for example):

- *Capture shutdown information on the shutdown task* (extract from the *Click Mobile Network Technician Work Instructions*)[352] – identifies the information to be captured, which includes proposed water off/on time, actual water off/on time, properties affected, and remedy code, and how this information is to be recorded.
- *IICATS Alarm Handling Workflow*[353] – provides guidance for validating alarm conditions and initiating a response.

As properties that experience an unplanned water interruption of more than 5 hours duration are entitled to a rebate, various process/guidance and example documents in relation to the assessment and application of rebates to customer accounts were provided by Sydney Water but are not further discussed for the purposes of this assessment.

As evidence of process implementation, Sydney Water provided examples of a work order where the impact of an unplanned interruption had been determined from data captured by a field crew, and work order that had been updated to reflect that the impact of an unplanned interruption as determined through a desktop assessment.

In support of the reported performance, Sydney Water provided a record of the data extracted from Maximo (work order/maintenance management system) and the BI (Business Intelligence) database.[354] This indicated that 37,312 properties had experienced an unplanned water interruption during the 2023/24 financial year. Given that there were 2,153,468 properties connected to water supply services, this equates to 173 per 10,000 properties affected by an unplanned interruption of more than 5 hours. Conversely, 9,827 per 10,000 properties were unaffected, as reported by Sydney Water.

In reviewing the above-referenced *Performance Indicator Sheet – Water Continuity Standard*, it appeared that the property types listed for exclusion were inconsistent with the *Operating Licence* requirement in respect of the inclusion of strata/multi-occupancy properties. In response to the auditor's enquiry, Sydney Water subsequently advised that a transcription error had been made when the documented procedure had been revised to reflect a change in data source; however, the correct enquiry code had still been applied as demonstrated by the above-referenced data extraction.[355] As a result, the *Performance Indicator Sheet – Water Continuity Standard*[356] was corrected and an additional added to the annual review process.

It is noted that, although the issue date of the updated *Performance Indicator Sheet – Water Continuity Standard* was recorded thereon, the version number was not revised.

OFI-SWC-2024-28: Take action to ensure that the version number, as well as issue date, is updated for each revision of a controlled document.

[351] Sydney Water, *Assessing Water Service Interruptions*, undated (file: *3. Assess Water Service Interruptions.pdf*).
[352] Document: *7. Work Instruction Field Crews.pdf.*
[353] Document: *9. IICATS Alarm Handling Workflow.pdf.*
[354] MS Excel workbook: *2023-2024 Unplanned greater than 5 Property Count.xlsx.*
[355] Document: *Water Continuity_exclusion strata type props-REVISED_26Sep24.pdf.*
[356] Sydney Water, *Performance Indicator Sheet; PS 1 - Water Continuity Standard OL 5.1.1 - Number of properties that experience an unplanned water interruption exceeding 5 hours* (Version 1), 24 September 2024 (file: *PS -1 Water Continuity Standard-REVISED_FY23-24.pdf*).

In response to the auditor's queries regarding analysis undertaken by Sydney Water to understand either failure to achieve/comply with the Water Continuity Standard or demonstrated improvement in performance, Sydney Water advised/provided evidence as follows:[357,358]

- Sydney Water undertakes analysis to understand performance including daily monitoring via the Power BI platform and monthly trend reporting[359] to internal stakeholders, including the Water Continuity Heads of Business (HoB) Focus Group (see below) at monthly meetings.
- Improvement recommendations identified in the *Lessons identified; Water continuity incidents in 2019-20* report,[360] prepared in response to performance failure in 2019/20, were completed by 30 June 2023 with the exception of one action related to the visibility of network valve status (completion expected in 2025).
- Actions taken in response to larger water continuity incidents that occurred during the period September to December 2022 have included:
  - Declaration of a Water Continuity Incident (March 2023);
  - Implementation of a *Water Continuity Impact Mitigation Plan*, with weekly situation reporting (March-July 2023);
  - Post Implementation Review Workshop (August 2023) with findings subsequently reported (October 2023);
  - Establishment of a Water Continuity Working Group to implement the review findings (November 2023); and
  - Establishment of a Water Continuity HoB Focus Group to provide leadership and oversee water continuity implementation activities of the Working Group (February 2024).

  Of the six recommendations arising from the Post Implementation Review Workshop, four had been completed by 30 June 2024 with the remaining two awaiting implementation of the 'Flow' field mobility platform (replacement for the current 'Click' platform) in March 2025.
- A Hot Debrief Analysis Project,[361] one of the recommendations arising from the Post Implementation Review Workshop, was conducted in respect of water continuity incidents affected more than 100 properties. With a focus on identifying 'quick wins', this exercise took the form of a mini root cause analysis; key findings related to frequency of occurrence (jobs on 100mm pipes are predominant), complexity of repair (a major impact on duration of outage) and time of break (also impacts time taken to repair). The analysis further revealed improvements that can be implemented in respect of valve management, network management, and process enhancement. A repeat analysis using a larger data set (5-10 years) is now proposed.

Terms of Reference have been developed for the Water Continuity HoB Focus Group, which demonstrates an ongoing commitment to this initiative. Objectives, and roles and responsibilities of the group are identified, together with the cross-business membership.

Collectively, these actions demonstrate a commitment to maintaining better situational awareness and identifying and responding to factors that impact water continuity performance.

[357] Sydney Water response to 2024 Audit Questionnaire (file: *2023-24 OL Audit Questionnaire.docx*).
[358] Document (PowerPoint presentation): *Presentation - Water Continuity_for Fail and Improvement questions.pdf.*
[359] Document (PowerPoint presentation): *12. Presentation_HoB Meeting_Water Continuity Trends Update_20March2024.pdf.*
[360] Document: *11. Lessons Identified - Water Continuity Incidents 2019-20 Report - December 2021.pdf.*
[361] Document (PowerPoint presentation): *16. Presentation_HoB Meeting_Hot Debrief Analysis Outcomes_20March2024.pdf.*

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

The following opportunity for improvement has been identified from the assessment in respect of this obligation:

- **OFI-SWC-2024-28:** Take action to ensure that the version number, as well as issue date, is updated for each revision of a controlled document (for example, for the *Performance Indicator Sheet – Water Continuity Standard* updated on 24 September 2024).

2.3.1.2 Water Continuity Standard – Data Integrity (sub-clause 5.1.4)

Sub-clause	Requirement	Compliance Grade
5.1.4	Sydney Water must use the best available data (taking account of water pressure data, where available) to determine whether a Property has experienced an Unplanned Water Interruption.	 **Compliant**

Risk if non-compliant

Failure to use the best available data to determine whether a Property has experienced an Unplanned Water Interruption may result in Sydney Water being less than fully aware of level of service deficiencies. This presents a potential high risk to public health.

Evidence sighted

Refer Appendix C (C.2.4).

Summary of audit findings/reasons for grade

Sydney Water demonstrated that it implements robust processes to capture and analyse the best available data to determine whether a property has experienced an Unplanned Water Interruption. Data is captured from enterprise management systems including (for example) the Maximo maintenance management system and Hydra geographical information system and subsequently drawn for monitoring and reporting purposes using Power BI generated reports. Comprehensive analysis is undertaken for cases identified by exception, or when deemed necessary to validate performance records.

On this basis, Sydney Water is assessed to have demonstrated compliance with this obligation.

Areas of good practice observed

Sydney Water has demonstrated compliance with this obligation. No specific areas of good practice have been identified.

Discussion and notes

The processes for determining whether a property has experienced an Unplanned Water Interruption, and the data used to do so, are discussed in **section 2.3.1.1** (in relation to sub-clause 5.1.1).

As reported, data is sourced primarily from work order records, which identify the section of water main impacted by an outage and the period that it was isolated (time water off/on). The number of properties impacted is then determined from Sydney Water's GIS, which identifies properties that have a service connection to the isolated section of main.

As also reported, records derived from the Maximo work order/maintenance management system and Hydra GIS are augmented, when required, by a desktop hydraulic assessment undertaken in accordance with the *Assessing Water Service Interruptions* procedure.[362] This procedure provides guidance for undertaking assessments to determine the number of properties affected by an unplanned water outage under various scenarios.

In respect of "best available data", the procedure identifies specific data sources, which include (in order of data quality):

[362] Sydney Water, *Assessing Water Service Interruptions*, undated (file: *3. Assess Water Service Interruptions.pdf*).

- IICATS (telemetry) data from pressure gauges, flowmeters, etc. located across the water supply network – this is considered a high-quality data source and may override data from other sources.
- NWNN (No water, no notice) calls to Sydney Water's customer call centre, which involves speaking to a Sydney Water Customer Experience Representative, who is trained and has access to online guidance[363] to obtain accurate information.
- NWF (No water form) submissions made on the Sydney Water website, which is considered low-quality data as a submission can be made without any verification taking place.

Reference is also made to the need to undertake hydraulic modelling if an assessment is complex, including (for example) if isolation of the main takes more than 5 hours, there are many indirectly impacted properties, or if there is minimal telemetry data available.

The detailed guidance provided ensures that the best available data is used to determine whether a property has experienced an unplanned water interruption.

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this obligation.

[363] Document: *10. Screenshot -No Water_from SW web_accessed26August2024.docx.*

2.3.2 Water Pressure Standard (clause 5.2)

2.3.2.1 Water Pressure Standard (sub-clause 5.2.1)

Sub-clause	Requirement	Compliance Grade
5.2.1	Sydney Water must ensure that, in each financial year, at least 9,999 Properties per 10,000 Properties (in respect of which Sydney Water provides a Drinking Water supply service) receive a Drinking Water supply service affected by fewer than 12 Water Pressure Failures (the **Water Pressure Standard**). ***Note:*** ***Water Pressure Failure*** *means a situation in which a Property experiences a pressure of less than15 metres head of pressure for a continuous period of one hour or more, such head of pressure measured at the point of connection (usually the main tap) of the Property to Sydney Water's Drinking Water supply system.*	 **Compliant**

Risk if non-compliant

Failure to comply with the Water Pressure Standard by adequately limiting the number of Water Pressure Failures would indicate that Sydney Water has failed to maintain an adequate level of service, thereby presenting a potential high risk to public health.

Evidence sighted

Refer Appendix C (C.2.5).

Summary of audit findings/reasons for grade

Sydney Water complied with the Water Pressure Standard in that 9,999 (compared to the permitted 9,999) per 10,000 properties were affected by fewer than 12 Water Pressure Failures during the audit period (actually, closer to 10,000 per 10,000). Sydney Water also demonstrated that it implements robust processes to capture and, to the extent necessary, analyse the relevant data in determining its performance against the Standard, consistent with the definitions and exclusions set out in the *Operating Licence*.

Accordingly, Sydney Water is assessed to have been compliant with this obligation.

Areas of good practice observed

Sydney Water has demonstrated compliance with this obligation. No specific areas of good practice have been identified.

Discussion and notes

Sydney Water reported that during the 2023/24 financial year, 9,999 per 10,000 properties received a Drinking Water supply service affected by fewer than 12 Water Pressure Failures.[364] This equates to the permitted maximum of 9,999 per 10,000 properties; on this basis, Sydney Water complied with the Water Pressure Standard during the audit period.

Sydney Water has documented procedures for determining the number of properties that have experienced a water pressure failure, including:

[364] Sydney Water, *Operating Licence 2019-23; Performance Standards for Service Interruptions Report 2023-24*, undated.

- *Performance Indicator Sheet – Water Pressure Standard*[365] – which replicates the relevant *Operating Licence* definitions and outlines the process for extracting relevant data from Sydney Water's business systems (including data sources and query details).
- *Water Pressure Failure Analysis Procedure*[366] – which details the procedure for determining the number of properties that have received inadequate water pressure at their point of connection.
- *Compiling & Assessing Pressure Failure Events Work Instruction*[367] – which provides a step-by-step guide on how to compile the Water Pressure Report (identifies potential water pressure failure on the basis of pressure monitoring data) and undertake the analysis required to confirm if a pressure failure has occurred in the network.
- *Low Water Pressure Rebates Work Instruction*[368] – sets out a detailed process for determining properties impacted by a low-pressure event.

There are two mechanisms through which water pressure failures can be identified:

- Online pressure gauge monitoring data compiled through the IICATS/SCADA system; and
- Desktop assessment undertaken by Operations Performance and Data Insights (OPDI) team in response to customer reporting of a pressure fault (complaint) via the Customer Call Centre.

Water pressure failure analysis is based principally on pressures recorded by approximately 1000 gauges located across the network, typically at (or close to) local high points. These are generally logged every 15 minutes via IICATS, with online alarming for some installations.

Data collected by the pressure gauges is automatically transferred to the IICATS BI (Business Intelligence) platform, from which weekly reports are generated to identify if and where pressure failures have occurred. Pressure failures are investigated to ensure compliance with the Water Pressure Standard and processed to record the number of properties affected as required by the *Operating Licence*.

Pressure failures identified through customer enquiry or complaint are managed in accordance with the *Water pressure customer complaint management process*,[369] under which analysis is undertaken in accordance with the above-mentioned procedures/work instructions, as appropriate.

In support of the reported performance, Sydney Water provided a record of the data extracted from Maximo (work order/maintenance management system) and the BI (Business Intelligence) database.[370] This indicated that 66 properties had experienced 12 or more water pressure failures during the 2023/24 financial year. Given that there were 2,153,468 properties connected to water supply services, this equates to 0.3 per 10,000 properties affected by 12 or more water pressure failures. Conversely, 9,999.7 per 10,000 properties were unaffected, which is consistent with the 9,999 properties (rounded figure) reported by Sydney Water.

Sydney Water advised that, in order to maintain and/or improve its performance against the Water Pressure Standard, it:

[365] Sydney Water, *Performance Indicator Sheet; PS 2 - Water Pressure Standard OL 5.2.1 - Number of properties that experience 12 or more water pressure failure events* (Version 1), 1 August 2023 (file: *6. PS 2 - Water Pressure Standard - OL 5.2.1 - 2023-24-rev.docx*).
[366] Sydney Water, *Procedure; Water Pressure Failure Analysis* (Version 4), 6 February 2023 (file: *1. DOC0333-Water pressure failure analysis.docx*).
[367] Sydney Water, *Work Instruction; Compiling & Assessing Pressure Failure Events* (Version 4), 21 August 2023 (file: *2. DOC0333.01 -V04- Compiling & Assessing Pressure Failure Events.docx*).
[368] Sydney Water, *Work Instruction; Low Water Pressure Rebates* (Version 1), 1 December 2022 (file: *3. D0002142.03 - Low Water Pressure Rebates.pdf*).
[369] Document: *4. DOC0333.03 Water Pressure Customer Complaint Management Process.pdf*.
[370] MS Excel workbook: *5. Water Pressure Standard PS 2 - Property Pressure Failure Compliance report.xlsx*.

- Tracks performance on a monthly basis and provides a forecast of annual figure based on monthly performance (which identifies the potential need for preventative action in advance).
- Investigates all pressure failures recorded by pressure gauges to understand the reasons and take corrective action. Such action is undertaken in conjunction with field staff.
- Assessment of opportunities for improving pressure in low pressure areas/identified clusters, including analysis of issues such as customer willingness to pay.

In reviewing the various procedural documents provided in respect of this obligation, it appears that there is a degree of overlap. Whilst it is acknowledged that guidance may, in part, be required for different end purposes (e.g. performance reporting and assignment of rebates), and there is likely a need to be consistent with the corporate document hierarchy, there may be some opportunity for rationalisation.

OFI-SWC-2024-29: Review and, if deemed beneficial, rationalise procedural documentation related to the Water Pressure Standard (may also be considered for other performance standard procedural documentation).

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

The following opportunity for improvement has been identified in respect of this obligation:

- **OFI-SWC-2024-29:** Review and, if deemed beneficial, rationalise procedural documentation related to the Water Pressure Standard (may also be considered for other performance standard procedural documentation).

2.3.3 Dry Weather Wastewater Overflow (clause 5.3)

2.3.3.1 Dry Weather Wastewater Overflow Standard (sub-clause 5.3.1)

Sub-clause	Requirement	Compliance Grade
5.3.1	Sydney Water must ensure that, in each financial year, at least: a) 9,928 Properties per 10,000 Properties (in respect of which Sydney Water provides a sewerage service but excluding Public Properties) receive a sewerage service unaffected by an Uncontrolled Wastewater Overflow; and b) 9,999 Properties per 10,000 Properties (in respect of which Sydney Water provides a sewerage service but excluding Public Properties) receive a sewerage service affected by fewer than three Uncontrolled Wastewater Overflows, (the **Dry Weather Wastewater Overflow Standard**). ***Note:*** ***Wastewater Overflow*** *is the discharge of untreated or partially treated sewage from:* *a) any part of Sydney Water's Wastewater system; or* *b) any part of a Customer's Wastewater system where the cause of the discharge is a problem with Sydney Water's Wastewater system.* ***Uncontrolled Wastewater Overflow*** *is a Wastewater Overflow occurring in dry weather that is not a Controlled Wastewater Overflow.* ***Controlled Wastewater Overflow*** *is a sewage overflow that is directed by Sydney Water via a designed structure to a predetermined location such as a Stormwater Drainage System or waterway in order to prevent overloaded or blocked sewers from discharging at sensitive locations, on private property or within buildings (thus endangering public health or causing a public nuisance).*	 **Compliant**

Risk if non-compliant

Failure to comply with the Dry Weather Wastewater Overflow Standard by adequately limiting the number of Dry Weather Wastewater Overflows would indicate that Sydney Water has failed to maintain an adequate level of service, thereby presenting a potential high risk to public health and the environment and/or causing public nuisance.

Evidence sighted

Refer Appendix C (C.2.5).

Summary of audit findings/reasons for grade

Sydney Water complied with both elements of the Dry Weather Wastewater Overflow Standard during the audit period, as follows:[371]

- 9,982 (compared to the permitted 9,928) per 10,000 properties were unaffected by a dry weather overflow; and
- 9,999 (compared to the permitted 9,999) per 10,000 properties were affected by fewer than three dry weather overflows (actually, closer to 10,000 per 10,000).

Sydney Water also demonstrated that it implements robust processes to capture and, to the extent necessary, analyse the relevant data in determining its performance against the Standard, consistent with the definitions and exclusions set out in the *Operating Licence*.

Accordingly, Sydney Water is assessed to have been compliant with this obligation.

Areas of good practice observed

Sydney Water has demonstrated compliance with this obligation. No specific areas of good practice have been identified; however, it is noted that Sydney Water does undertake detailed analysis to understand the factors (such as deep soil moisture) that impact on performance in respect of wastewater overflows.

Discussion and notes

Sydney Water reported that during the 2023/24 financial year:

- 9,982 per 10,000 properties (excluding Public Properties) received a sewerage service unaffected by an Uncontrolled Wastewater Overflow; this compares favourably with the permitted maximum of 9,928 per 10,000 properties; and
- 9,999 per 10,000 properties (excluding Public Properties) received a sewerage service affected by fewer than three Uncontrolled Wastewater Overflows; this equates to the permitted maximum of 9,999 per properties.

On this basis, Sydney Water complied with the Dry Weather Wastewater Overflow Standard during the audit period.

It is noted that an Uncontrolled Wastewater Overflow is one that occurs in dry weather. For the purposes of reporting against this obligation, Sydney Water identifies an overflow that occurs due to a full or partial blockage in the pipe in its sewerage system (e.g. tree root intrusion) or a system failure (e.g. pumping station failure) as an Uncontrolled Wastewater Overflow.

There are two mechanisms through which uncontrolled wastewater overflows can be identified:

- Work order records prepared by field crews when undertaking maintenance/repair works; and
- Desktop assessment undertaken by Operations Performance and Data Insights (OPDI) team in response to a customer contact (complaint) via the Customer Call Centre.

In the majority of cases, the number of properties experiencing uncontrolled wastewater overflows is derived from field recorded data. When attending the site in response to an overflow, any properties affected by the overflow from a Sydney Water sewer are identified and recorded in the relevant work order fields.[372]

[371] Sydney Water, *Operating Licence 2019-23; Performance Standards for Service Interruptions Report 2023-24*, undated.
[372] Document: *6. EXAMPLE 1 WO 89310133.docx*.

Identification of properties that have experienced an uncontrolled wastewater overflow 'by exception' may be prompted by (for example) a complaint, if field data was not collected, or to verify field recorded data. In these cases, a desktop assessment, which uses data available from Maximo (work order/maintenance management system) and Hydra (GIS); work orders are updated to capture the affected property information.[373]

Sydney Water has documented procedures for determining the number of properties that are affected by uncontrolled wastewater overflows, including:

- *Performance Indicator Sheet – Dry Weather Wastewater Overflow Standards*[374] – which replicates the relevant *Operating Licence* definitions and outlines the process for extracting relevant data from Sydney Water's business systems (including data sources and query details).
- *Wastewater Desktop Property Affected Rebate Assessment Work Instruction*[375] – which details the desktop assessment process for determining properties affected by an uncontrolled overflow when not identified by the field crew.
- *Unplanned Sewer Discontinuity Rebate Work Instruction*[376] – which also details the process for assessing affected properties drawing on data from Maximo and Hydra.

Other supporting guidance is also available, including (for example):

- *Recording Problem, Cause and Remedy (BM tasks only)/Recording Taks Results/Recording Additional Field Operations* (extract from the *Click Mobile Network Technician Work Instructions*)[377] – identifies the information to be captured and how this information is to be recorded.
- *Completing a reactive wastewater job with surcharge* (extract from the *Click Mobile Network Technician Work Instructions*)[378] – details how affected properties are to be identified and recorded in the GIS component of Click mobile (Tensing).
- *Key information for wastewater rebate*[379] – provides guidance for ensuring that any sewer overflow/spill on customer property caused by a Sydney Water fault is correctly captured in Tensing.

As properties that experience an uncontrolled wastewater overflow are entitled to a rebate, various process/guidance and example documents in relation to the assessment and application of rebates to customer accounts were provided by Sydney Water but are not further discussed for the purposes of this assessment.

In support of the reported performance, Sydney Water provided a record of the data extracted from Maximo (work order/maintenance management system) and the BI (Business Intelligence) database.[380] This indicated that:

- 3,722 properties had been affected by a wastewater overflow during the 2023/24 financial year. Given that there were 2,102,705 properties connected to wastewater services, this equates to 18 per 10,000 properties affected by an uncontrolled wastewater overflow. Conversely, 9,982 per 10,000 properties were unaffected, as reported by Sydney Water.

[373] Document: *7. EXAMPLE 2 WO 91521037.docx.*
[374] Sydney Water, *Performance Indicator Sheet; PS 3 – Dry Weather Wastewater Overflow Standards OL 5.3.1 (a) and (b)* … (Version 1), 1 August 2024 (file: *9. PS 3 - Wastewater Overflow Standard FY23-24.docx*).
[375] Sydney Water, *Work Instruction; Wastewater desktop property affected rebate assessment* (Version 1), 1 July 2022 (file: *3. Wastewater desktop assessment and rebate process.docx*).
[376] Sydney Water, *Work Instruction; Unplanned Sewer Discontinuity Rebate* (Version 1), 1 December 2022 (file: *4. D0002142.04 Unplanned Sewer Discontinuity Rebate.pdf*).
[377] Document: *1. D0001274 – excerpt.pdf.*
[378] Document: *1. Processing Affected Props - excerpt.pdf.*
[379] Document: *2. Key information for wastewater rebate.pdf.*
[380] MS Excel workbook: *8. Dry Weather WWO Standard - property compliance.xlsx.*

- 17 properties had been affected by three or more wastewater overflows during the 2023/24 financial year. Again, given that there were 2,102,705 properties connected to wastewater services, this equates to 0.1 per 10,000 properties affected by three or more wastewater overflows. Conversely, 9,999.9 per 10,000 properties were unaffected, which is consistent with the 9,999 properties (rounded down figure) reported by Sydney Water.

Sydney Water advised that, in order to maintain and/or improve its performance against the Dry Weather Wastewater Overflow Standard, it:

- Carries out regular work instruction reviews.
- Conducts short training sessions[381] with the frontline/field workforce which includes the provision of data analysis and root cause analysis information to raise awareness and encourage better practices to improve data capture for uncontrolled wastewater overflows.[382]
- Undertakes analysis to understand the demonstrated improvement in performance, particularly the role of weather and climate and its influence on soil moisture and chokes which can lead to uncontrolled wastewater overflows. This analysis shows a very strong correlation between measured deep soil moisture and the number of blockages causing overflows.[383]

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this obligation.

[381] Documents: *11. Email - training to frontline team – 1.pdf* and *12. Email - training to frontline team – 2.pdf.*
[382] PowerPoint presentation: *13. Sewer overflow on private presentation 160524 (Ryde Depot).pptx.*
[383] Sydney Water, *Operating Licence 2019-23; Performance Standards for Service Interruptions Report 2023-24*, undated, figure 11.

2.3.4 Asset management (clause 5.5)

2.3.4.1 Asset management – Implementation of the AMS (sub-clause 5.5.2)

Sub-clause	Requirement	Compliance Grade
5.5.2	Sydney Water must ensure that the Asset Management System is fully implemented and that all relevant activities are carried out in accordance with the Asset Management System.	**Compliant**

Risk if non-compliant

Failure to fully implement its Asset Management System presents a high level of operational risk that Sydney Water may not be able to effectively manage the safe and reliable performance of its assets as required to meet its business objectives. Failure to effectively manage the assets may result in a failure to meet service performance standards and increased operational costs.

Evidence sighted

Refer Appendix C (C.2.7).

Summary of audit findings/reasons for grade

Sydney Water demonstrated that it had continued to fully and effectively implement its Asset Management System during the audit period. This is evidenced in part by it continuing to maintain accreditation of the Asset Management System as being consistent with the Australian Standard AS ISO 55001 *Asset management – Management system – Requirements*.

More specifically, Sydney Water demonstrated that it has managed its asset portfolio in accordance with the Asset Management System through the provision of example documentation and records related to the strategy and planning; asset creation; maintenance; and asset renewal phases of the asset lifecycle. Evidence of ongoing asset management related training and internal assurance audits was also provided.

Sydney Water explained and demonstrated ongoing improvements, including the timely delivery of all but one of twenty-two planned deliverables under the *Service Excellence Road Map*. Specific improvements made during the audit period include (for example):

- development of the *Performance Cost and Risk (PCaR) Framework*, which is aimed at driving asset performance;
- further development of an Asset Performance Tool, which is used to monitor and provide performance 'real time' visibility, including by monitoring metrics such as maintenance completion;
- design of a Business-Critical Projects Assessment Tree which provides a clear risk hierarchy to inform prioritisation decision making; and
- adopting a more integrated approach to managing the asset lifecycle through the development of 'Infrastructure Strategies', which will replace the 'Asset Class Plans' previously used as the basis of asset management from a tactical perspective.

It is evident that the benefits of these and other improvements are now being realised.

On the basis of the observations made, Sydney Water is assessed to have demonstrated full compliance with this obligation.

Areas of good practice observed

Sydney Water has demonstrated full compliance with this obligation. The extensive body of work that has been implemented under the *Service Excellence Framework/Improvement Program* (as reflected in the *Service Excellence Roadmap*) and other initiatives to improve the Asset Management System is again commended.

An increase in cross-business engagement/integration was observed during the audit of this and other obligations; this was further reflected in the enthusiasm of the staff who presented at the audit. Such interaction will no doubt lead to improved service performance.

The adoption of a more integrated approach to managing the asset lifecycle through the development of 'Infrastructure Strategies' is also considered a positive initiative.

Discussion and notes

Overview:

Assessment of compliance in respect of this obligation has involved review of Sydney Water's management of its assets under its AS ISO 55001 certified Asset Management System (AMS). This has included review of the system documentation and records of implementation (both at system level and in the field), and more detailed assessment of some aspects based on field observations.

It is noted that Sydney Water has continued to implement ongoing improvements in accordance with the *Service Excellence Road Map*, details of which are also discussed in the following.

Asset Management System Overview:

The *Asset Management Policy*, *Strategic Asset Management Plan* and a series of Asset Class Plans (including Asset Management Plans for treatment plants operated under BOOT contract arrangements) are the key governance and guidance documents for Sydney Water's AMS.

The *Asset Management Policy*,[384] which was last reviewed/updated in February 2023, sets out Sydney Water's commitment to manage its assets to achieve the strategic outcomes detailed in its Corporate Strategy, which are aimed at achieving the vision to "*create a better life with world class services*". The principles that guide sustainable management of Sydney Water's infrastructure to provide water services are identified.

The *Strategic Asset Management Plan* (SAMP)[385] is the central document to Sydney Water's AMS. The purpose of the SAMP is: "*…clarify intentions, priorities, and practices to be adopted. It takes a long-term view and considers the combination of organisation needs, stakeholder expectations and the realities of existing assets and asset management capabilities*". It embraces the principles of asset management (as outlined in the *Asset Management Policy*) and identifies Asset Management Objectives that align with the Corporate strategic outcomes. The SAMP was last updated in August 2023 (i.e. during the audit period) following a major rewrite in March 2023.

Prior to and during the audit period, Sydney Water had been migrating from its previous 'Master Plans' to a series of 'Asset Class Plans' as the mechanism through which it outlines its tactical approach to the management of its asset portfolio. In conjunction with the improvement initiatives being implemented under the Service Excellence Program, however, it has now adopted and is implementing a series of 'Infrastructure Strategies', which are further discussed below (in respect of Improvement Initiatives). Notwithstanding, the Asset Class Plans remained in place during/for the majority of the audit period.

[384] Sydney Water, *Policy; Asset Management Policy* (Version 5), February 2023 (file: *1a. AMQ0033_Asset Management Policy.pdf*).
[385] Sydney Water, *Strategic Asset Management Plan* (Version 7), August 2023 (file: *1b. D0000876_Strategic Asset Mgmt. Plan.pdf*).

Review of examples of Asset Class Plans, including the *Wastewater Treatment Plants Asset Class Plan*,[386] the *Water Network Facilities Asset Class Plan*,[387] the *Water Filtration Plant Asset Class Plan*,[388] and the *Reservoir Asset Class Plan*,[389] confirms that these plans detail the tactical approach to management of the specific asset class. They provide an overview of the assets (including details of the assets, condition, criticality and risk profile); identify performance requirements (levels of service and future demands); detail the approach to asset lifecycle management; detail how a risk management approach is implemented in respect of the asset class; provide a summary of operation/maintenance and capital expenditure requirements; and the arrangements for continuous improvement (which includes annual risk, issue and opportunity (RIO) assessments) and identified emerging opportunities.

Further review of the *Reservoir Asset Class Plan* reveals that it includes additional focussed information in appendices including (for example) the standard Reservoir asset hierarchy (as adopted in Maximo); a listing of reservoirs that are heritage listed; a list of candidates for future renewal (identified from Level 1 inspections; Level 2 inspections are undertaken to refine the list); a list of data sources, i.e. systems in which asset class data is retained; asset class stakeholders; links to relevant plans and standards; inspection types and frequencies; and current levels of risk. Other *Asset Class Plans* also include this and other focussed information as applicable; the *Wastewater Treatment Plants Asset Class Plan* (for example) includes information in respect of compliance with discharge licences.

Under the BOO (Build Own Operate) contractual arrangements in respect of (for example) the Prospect Water Filtration Plant (WFP), the Illawarra and Woronora WFPs (Wyuna Contract) and Macarthur WFP, the operators (SUEZ, Veolia and TRILITY respectively) each have in place facility focussed Asset Management Plans[390,391,392] These documents detail the operators' commitment to the management of assets for which it is responsible and the arrangements for managing operation and management of the facility.

System Implementation:

General:

Sydney Water provided sample documentation to demonstrate ongoing implementation of asset management practices as they relate to various aspects of the asset management lifecycle, consistent with its AMS. A review of some of the practices /documentation is set out in the following.

Asset Planning and Creation:

The asset planning and creation process is summarised in the *Approve Project Investments – Process Overview* flow diagram as presented in the Helix management platform.[393] As with other elements of asset management practice, the asset creation process is governed through the submission and approval of business cases at each stage of development; this process is detailed in the *Business Case Guideline*, [394] which details the purpose of and requirements for each

[386] Sydney Water, *Asset Class Plan; Wastewater Treatment Plants (WWTP)* (Version 1), 1 July 2022 (file: *1d. D0002159 Wastewater Treatment Plant Asset Class Plan 2022.pdf*).
[387] Sydney Water, *Asset Class Plan; Water Network Facilities* (Version 1), 25 November 2022 (file: *1d. D0002194 Water Network Facilities - Asset Class Plan.pdf*).
[388] Sydney Water, *Asset Class Plan; Water Filtration Plants*, undated (file: *1d. AMQ0123 Water Filtration Plants Asset Class Plan.docx*).
[389] Sydney Water, *Asset Class Plan 2022; Reservoirs* (Version 6), 2 September 2022 (file: *1d. AMQ0120 Reservoir Asset Class Plan.docx*).
[390] SUEZ, *Strategic Asset Management Plan; Prospect Water Filtration Plant O&M* (Version 3), 2 August 2022 (file: *AM-P-001 PWFP SAMP. V3.pdf*).
[391] Veolia, *Strategic and Tactical Asset Management Plan; Wyuna Contract; Illawarra and Woronora Water Filtration Plants* (Revision 6), 9 April 2021 (file: *1d. Wyuna STAMP 3 - MAN-5450 - Wyuna - Strategic and Tactical Asset Management.pdf*).
[392] TRILITY, *Asset Management Plan; Macarthur Water Filtration Plant* (Revision 13), 31 March 2023 (file: *1d. Macarthur WFP AMP MAC-PLN-003 AMP Rev 13 Complete.pdf*).
[393] Document: *5a. Helix extract - Approve Project Investments - Process Overview.png.*
[394] Sydney Water, *Business Case Guideline* (Version 3), 1 July 2023 (file: *3e. 2936429 Business Case Guideline.docx*).

approval stage (Project Initiation, Needs Approval, Option Approval, Delivery Approval, and Variation Approval; a Small Project Approval can be used for projects less than $5 million).

The asset planning process is undertaken in accordance with *System and Asset Planning Framework*[395] and the *Planning Decision Framework*.[396] The *System and Asset Planning Framework* provides a framework or approach that is followed in planning systems, products and infrastructure as required to implement the high-level strategies set out by Government in conjunction with Sydney Water. The *Planning Decision Framework* details the processes to be implemented for selecting a preferred option during an infrastructure-based planning activity, identifying economics, risk and customer experience as key drivers of the process.

These planning frameworks are implemented through more detailed guidance presented in (for example) the *Water System Planning Guideline*,[397] the *Wastewater Planning Guidelines*,[398] and the *Wastewater Treatment Planning Guidelines*.[399]

Key documents that capture/record the outcomes of the planning process include regional master plans, which set directions for asset classes that deliver the services to customers in each region, and system plans, which outline the changes to the asset base in a diagrammatic format (plan). Collectively, the outcomes presented in these documents assure a continued level of service within the legislation and licence conditions. The above referenced *Asset Class Plans* are also ultimately informed by the planning process.

Examples of planning outcomes include (for example) the Leppington[400] and Leppington North[401] Wastewater Local Area Scheme Plans, which show the existing wastewater networks and proposed augmentations, and the *Penrith Wastewater System Plan*, which presents a detailed assessment of existing and future wastewater servicing requirements in the region, together with short and long-term investment requirements.

At a more detailed level, advice that draws on information developed through the planning process is provided in response to servicing enquiries from developers or other customers. This may result in the provision of formal planning advice, for example the response to an enquiry seeking water and wastewater services to a proposed multi-storey residential development in Penrith.[402]

Given its reliance on professional engineering services to create, maintain and operate its assets, Sydney Water uses guidance presented in the *Engineering Competency Standard*[403] to assess a person's competence to carry out specific engineering tasks for design and protection of Sydney Water's infrastructure assets and associated works. The *Standard* details the required competencies by role/responsibility level and by engineering discipline. Application of the standard, such as an example assessment, was not sighted for the purposes of the audit; however, the embodied principle of ensuring that work is undertaken by appropriately skilled and experienced personnel is supported by the auditors.

Records provided as evidence of implementation of the asset creation process related to the proposed augmentation works at the Cascade WFP and the "Quakers Hill and St Marys WRP

[395] Sydney Water, Policy; *System and Asset Planning Framework* (Version 1), 5 December 2022 (file: *3a 3005317 System and Asset Planning Framework.pdf*).
[396] Sydney Water, *Framework: Planning Decision Framework* (Version 4), 19 July 2023 (file: *3a. D0000732- Planning Decision Framework.pdf*).
[397] Sydney Water, *Water System Planning Guideline* (Version 1), September 2014 (file: *3a AMQ0562 Water System Planning Guideline.pdf*.)
[398] Sydney Water, *Wastewater Network Planning Guideline* (Version 2), 11 March 2021 (file: *3a D0000666 Wastewater Planning Guideline.pdf*).
[399] Sydney Water, *Guideline; Wastewater Treatment Planning Guidelines* (Version 1.0), 2 July 2021 (file: *3a. D0001891 Wastewater Treatment Planning Guidelines.docx*).
[400] Document: *5a. Leppington WW Scheme Plan.pdf.*
[401] Document: *5a. Leppington_North Scheme Plan.pdf.*
[402] Document: *5b. Assessment_CN186532_Customer Inquiry_final advice.pdf.*
[403] Sydney Water, *Engineering Competency Standard* (Version 4), 19 February 2021 (file: *3c. D0000833 Engineering Competency Standard.pdf*).

Treatment Process and Reliability Renewal (PARR)" project being delivered via Delivery Partner under management of the Sydney Water Major Projects team. A brief overview of the projects with reference to sample records is as follows:

- Cascade Water Filtration Plant (WFP):

  Sydney Water has faced an extended period of poor raw water quality conditions and the step change in raw water quality puts increasing risk to meet demand for compliant with the *Australian Drinking Water Guidelines*. A 'Needs Approval Business Case'[404] been approved to build a pre-treatment process to reduce the impacts of poor raw water quality and minimise public health risks.

  As the treatment upgrade is required, Sydney Water and WaterNSW has undertaken joint planning through a Multi Criteria Analysis (MCA) to determine the best raw water supply options to supply the proposed new pre-treatment (MCA assessment notes provided).[405] The joint MCA has been used to justify the investment for the WaterNSW IPART submission, and to finalise the scope of the proposed Sydney Water upgrade works.

- Quakers Hill Water Resource Recovery Facility (WRRF):

  Quakers Hill WRRF is undergoing major capacity and capability upgrades as part of the Lower South Creek Treatment Program of works consisting of multiple projects addressing asset reliability, growth servicing capacity and capability improvements to align with mandatory standards and enable customer aligned outcomes. The majority of the construction works are complete and in commissioning/proving phase following a decade of planning, design and delivery. Examples of major associated business cases and interface meetings provided as evidence include the following:

  - Delivery Approval Business Case.[406]
  - Variation Business Case, which was sought for "… *escalation, latent conditions and additional scope arising from detail design*".[407]
  - Variation Business Case, which was sought to "… *negotiate up to the $11.8 million for provisional sum to cover potential expenditure specifically related to contractual disputes, impacts of Covid-19 and industrial relations*".[408]
  - *Weekly Interface Meeting – Quakers Hill*,[409] which documents the meetings between Sydney Water operational personnel and the Delivery Partners team.

Operation:

Sydney Water advised that operations at its sites are undertaken in accordance with the relevant management plans, operation and maintenance manuals and work instructions. Examples of these are referenced in **sections 2.2.1.1** and **2.2.2.1** (in respect of the implementation of the Drinking and Recycled Water Quality Management Systems, respectively), including discussion in respect of annual operational risk assessments undertaken in accordance with the *Operational Risk Assessment Workshop SOP*.[410]

Process flow diagrams for *Cascade Water Filtration Plant*[411] and *Quakers Hill Water Resource Recovery Facility*[412] provide an overview of the componentry and therefore underpin the operational arrangements/requirements for each facility.

[404] Document: *6a - IN.P0000711 WT 41 Cascade WFP Pre-treatment NABC_23 Feb 24 AT - Approved LB.pdf.*
[405] Document: *6a Cascade Raw Water Options MCA Workshop 2_Options Summary_240305_Final.docx.*
[406] Document: *6a - 20031056 - 20031057 - Quakers Hill and St Marys PARR DABC and PS_20 September 2017.pdf.*
[407] Document: *6a - 20031056 - 20031057 - Quakers Hill- St Marys PARR VBC for Kevin J sign off.pdf.*
[408] Document: *6a - 20031056 - 20031057 - Reference - Quakers Hill- St Marys PARR VBC_Ver 4.0.pdf.*
[409] Document: *6a - Weekly interface Meeting Agenda - Quakers Hill 2024-02-13.docx.*
[410] Sydney Water, *Procedure; Operational Risk Assessment Workshop SOP for Drinking Water* (Version 6.0), 12 May 2023 (file: *3c D0000799 Operational Risk Assessment Workshop Procedure.docx*).
[411] Document: *6b - D0000890 Cascade WFP Process Flow Diagram (PFD).pdf.*
[412] Document: *6b - D0002375 Quakers Hill WRRF Process Flow Diagram (PFD).pdf.*

Daily plant checklists such as the *Cascade WFP Rounds Sheet*[413] and *Quakers Hill Process and Equipment Monitoring Log sheet*[414] are used to prompt and record operator review and interactions across the plant and product streams in each case.

Maintenance:

Asset maintenance is undertaken in accordance with the principles and guidance provided in a collection of documents, including (for example):

- *Asset Maintenance Policy*,[415] which outlines the guiding principles and elements of asset maintenance management as implemented by Sydney Water (previously sighted).
- *Maintenance Strategy*,[416] defines the six maintenance strategies/approaches that are implemented by Sydney Water, including (for example) Failure Based Maintenance and Periodic Scheduled Maintenance (previously sighted).
- *Maintenance Management Framework*,[417] which identifies standards, definitions and methodologies used by Sydney Water to determine the maintenance requirements for assets.

Maintenance management is further supported by standards/guidance in respect of Condition Assessment, Major Periodic Maintenance and Investment Plan Reviews, which are further discussed below in respect of renewals.

Implementation of maintenance practices is demonstrated by:

- For Cascade WFP:
  - *Process Flow Diagram* (PFD),[418] which provides a consolidated schematic representation of the plant, including process steps, chemical dosing locations and control arrangements (specifically CCPs are identified).
  - A listing of work orders scheduled and completed during the audit period.[419] This includes programmed/preventative (PM), corrective (CM) and breakdown (BM) maintenance work orders. A total of 621 work orders were listed, including 491 PM, 98 CM, 23 BM and 9 others; these were as would typically be expected.
  - A completed/approved *MPM Deferral Form* in respect of Pump WP0330PMP5208 was provided; this indicated that refurbishment of this pump had been deferred until after the expected arrival of a spare pump and motor in January 2025 due to the high operational risk of proceeding under a duty/standby (instead of duty/duty/standby) arrangement.
  - The *Briefing Paper*[420] for the annual plant risk assessment review provided information in respect of operational performance and risks (including current issues, emerging issues, incidents, NSW Health notification, breakdowns and critical assets).

  Maintenance activities at the Cascade WFP are further discussed in the "Field Implementation" section below.

[413] Document: *Cascade Rounds Sheet.pdf*.
[414] Document: *6b - Quakers Hill Check sheet June24.pdf*.
[415] Sydney Water, Policy; *Asset Maintenance Policy* (Version 2), 21 November 0218 (file: *AMQ0002 - Asset Maintenance Policy.docx*).
[416] Sydney Water, *Standard; Maintenance Strategy* (Version 3), December 2022 (file: *D0000654 Maintenance Strategy.docx*).
[417] Sydney Water, *Framework; Maintenance Management Framework* (Version 2), 25 August 2023 (file: *3d. D0001854 Maintenance Management Framework.docx*).
[418] Document: *6b - D0000890 Cascade WFP Process Flow Diagram (PFD).pdf*.
[419] MS Excel workbook: *6b - Cascade - BM CM PM WO Report - FY 23-24.xlsx*.
[420] Sydney Water, *Cascade WFP; Briefing Paper; Annual risk assessment 2023-24*, May 2024 (file: *6b Cascade WFP - briefing paper - annual risk assessment 2024.pdf*).

- For Faulconbridge Reservoir and Pumping Station:
  - Listings of work orders scheduled and completed during the audit period for both the reservoir[421] and pumping station.[422] Activities were again typically as would be expected; CM work orders for the reservoir included (for example) mechanical /electrical related maintenance to an inlet control valve whilst BM work orders related to flooding of a valve pit.
  - *AIS Reservoir Inspection Reports* indicated that inspections undertaken on 18 October 2023[423] and 11 April 2024.[424] The October 2023 report indicated that there were some tree branches overhanging the reservoir, with a small amount of debris not causing water quality issues. The April 2024 report indicated that the inspector had removed debris from the ring drainage (ground level) and roof; minor corrosion of aboveground pipework and moderate to heavy corrosion of internal (roof support structure) beams was also noted.
  - A *L1 Inspection Report*[425] for an inspection undertaken on 27 June 2023 (just prior to the audit period) confirmed that the abovementioned corrosion had been assessed and rated Condition 3 (i.e. not requiring immediate attention).
  - As noted in the **Appendix B.3**, some discolouration of the external coating on the tank walls was observed. Notes headed *Faulconbridge WS0382 Site Visit/Scope development*[426] are evidence of initial planning/scoping work to address the Condition 4 rating assigned in respect of the "Condition of External Wall" and "Condition of Base Plate" in the above-referenced *L1 Inspection Report*. The notes indicate (in part) "*Corrosion at dosing point, external wall, outlet, overflow, side access hatch and valve. leaf litter on roof. Repair at external coating*" and "*Seal seems to be cracking and lifting in spots*" respectively.
- For Quakers Hill WRRF:
  - A listing of work orders scheduled and completed during the audit period.[427]
  - *Process Flow Diagram* (PFD),[428] which provides a consolidated schematic representation of the plant.
  - Minutes of monthly Wianamatta Hub Maintenance Meeting (which includes Quakers Hill and St Marys WRRPs).[429]
  - Records in respect of MPM performed on pumpset PMP7004 (SEPS Pump No: 4), including a completed/approved *MPM Approval Form* (October 2023),[430] the project *MPM Job Plan* (November 2023)[431] and a Condition Assessment Report (July 2024).[432]
  - A completed/approved *MPM Deferral Form* in respect of Screen ST0018SCN2521.[433] This step screen will not be required for operation once a change to sludge management arrangements is implemented.
- Minutes of a meeting between Sydney Water, WaterNSW, Sydney Water's BOO plant operators, and the Sydney Desalination Plant to discuss (plan and review) the joint annual maintenance program.[434] This forum ensures that each of these entities, which are collectively responsible for maintaining Sydney's water supply, manage their major maintenance activities in a manner that ensures supply is maintained throughout the network.
- Example work order records, including:
  - Breakdown maintenance – repair broken 100mm stop valve in Dural, October 2023.[435]
  - Corrective maintenance – replace broken valve on a 100mm CICL water main at Arncliffe, October 2023.[436]

- Planned/preventative maintenance – inspect/evaluate trunk main fittings and valves (100mm stop valve) in Lane Cove West, July 2023.[437]

- Condition assessment report, undertaken prior to completing MPM on Archimedes Screw Pump PMP5005 at Glenfield WRP.[438] The report detailed the assessment that was undertaken and recommended the scope of works required for reconditioning.

Further examples of maintenance implementation are provided in the discussion in respect of "Field Implementation" (see below).

Renewals:

Renewal planning and implementation is undertaken in accordance with the principles and guidance provided in a collection of documents, including (for example):

- *Asset Renewals Planning Standard*,[439] which sets the requirements to ensure that the asset renewal process is managed effectively by undertaking timely and consistent asset assessments; maintaining accessible records of assessment data; identifying objective asset renewal triggers; and initiating renewals in a timely manner. This will ensure that: "… *the right assets are renewed at the right time to maintain acceptable asset risk profiles at lowest lifecycle cost and limit unplanned work*" (previously sighted).
- *Facility Assets Renewal, Reliability and Business Efficiency Decision Framework*,[440] sets out the requirements for the selection, evaluation and approval of facility assets for renewal.
- *Procedure for Production's treatment plant facilities: 5 Year Investment Plan (5YIP) Review*,[441] which provides guidance for identifying short to mid-term investment needs for treatment plants.
- *Consequence of Failure Standard*,[442] which sets out the requirements for assessing and assigning a Consequence of Failure (CoF) score for all assets, processes and subprocesses.
- *Condition Assessment Framework*,[443] which details the strategic framework that guides the condition assessment process.

[421] MS Excel workbook: *6b - WS0382 - BM CM PM WO Report - FY 23-24.xlsx.*
[422] MS Excel workbook: *6b - WP0268- BM CM PM WO Report - FY 23-24.xlsx.*
[423] Document: *AISReservoirInspectionPassword-18038504.pdf.*
[424] Document: *6b. AISReservoirInspection - WS0382 Faulconbridge.pdf.*
[425] Document: *6b. WS0382 Faulconbridge L1 condition report.pdf.*
[426] Document: *6b. Faulconbridge WS0382 Painting Scope.docx.*
[427] MS Excel workbook: *6b - Quakers Hill- BM CM PM WO Report - FY 23-24.xlsx.*
[428] Document: *6b - D0002375 Quakers Hill WRRF Process Flow Diagram (PFD).pdf.*
[429] Document: *6b - Quakers Hill Monthly Maintenance Meeting minutes July 2024.pdf.*
[430] Document: *6b - MPMApprovalForm-ST0018PMP7004_AGSS.pdf.*
[431] Document: *6b - 20037938MPMJobPlanST0018PMP7004.pdf.*
[432] Document: *6b - 143434-SydneyWater-QuakersHill-VTP (CA).pdf.*
[433] Document: *6b - ST0018SCN2521MPMDeferralFormFY23-24SS.pdf.*
[434] Document: *5c - JAM Minutes 27 06 2024.pdf.*
[435] Document: *5d. BMWorkOrder89973184WR1VwithSGAN1756471.pdf.*
[436] Document: *5d. CMWorkOrder89800686withSGAN2770597.pdf.*
[437] Document: *5d. PMWorkOrder89114421withSGAN1764834.pdf.*
[438] West Region Delivery Team, *Technical Report; Glenfield WRP; Maintenance Program PMP5005 Archimedes Pump* (Rev 0), 3 July 2023 (file: *5e - CA report from Atlas.pdf*).
[439] Sydney Water, *Standard; Renewals Planning Standard* (Version 6), 21 April 2021 (file: *3a - DOC0520 Asset Renewals Planning Standard.docx*).
[440] Sydney Water, *Facility Assets Renewal, Reliability & Business Efficiency Decision Framework* (Version 5), undated (file: *3e. AMQ0116 Facility Assets Renewal Reliability and Business Efficiency Decision Framework.docx*).
[441] Sydney Water, *Procedure for Production's treatment plant facilities: 5 Year Investment Plan (5YIP) Review* (Version 3), 2 November 2018 (file: *3e - D0000365-Procedure-5YIP Review-Oct18.docx*).
[442] Sydney Water, *Standard: Consequence of Failure* (Version 8), 30 August 2023 (file: *3e - DOC0297 Consequence of Failure Standard.docx*).
[443] Sydney Water, *Framework; Condition Assessment* (Version 2), August 2022 (file: *3e - D0002013 Condition Assessment Framework.docx*).

- *Condition Assessment Standard*,[444] which details the purpose of and process for undertaking asset condition assessments and assigning Condition Assessment Grades (CAGs) to Sydney Water's assets, based on the risk and consequence of failure.
- *Mechanical and Electrical Like for Like Field-based Decision Framework*,[445] which provides a practical tool for use in support of repair or replacement of mechanical and electrical assets.
- *Reservoir Major Periodic Maintenance Decision Framework*,[446] which provides the rules and criteria for deciding the timing and scope of MPM on drinking and recycled water reservoirs. MPM can include the replacement or refurbishment of internal lining and roof elements.
- *Business Case Guideline*,[447] which provides general guidance in respect of business case preparation for various funding purposes (is applicable across the Sydney Water business).

From a practical/implementation perspective, the following were provided:

- Cascade WFP – approved seed funding request forms for "CT1713 – WT41 Cascade WFP Renew Non-Ionic Polymer".[448] Replacement of the Non-Ionic Polymer system is required for reasons including system past service life, degradation of pipework, environmental risk of polymer discharge to the environment, unknown condition of some pipework, lack of redundancy, and an improvement opportunity for the filter backwash system. Risk of deferral was assessed as High 2 for compliance and High 3 for Public Health and Environment.
- Quakers Hill – a completed and approved "Repair versus Replace – Decision Sheet" in respect of like for like replacement of Asset No: 11707445, Location: ST0018PMP8107 (Pump – CCTScour Pump, TNK8104) which had burnt out windings.[449]

AMS Training:

Sydney Water advised that two training courses have been rolled out to relevant asset management staff/personnel during the audit period. Records of attendance indicate that 157 completed the instructor-led "Finance for Non-Finance Managers"[450] and 53 completed the "Lead Others in an Asset Management Environment",[451] which was also instructor-led.

Sydney Water has also developed and implemented both formal and informal training in respect of its various improvement initiatives. As outlined in more detail in **section 3.2.3.1** (in respect of previous recommendation 2023-10), training has been implemented in respect of:

- How to use the Asset Performance Tool (APT) – training based on the *How to use AP Tool Procedure*.[452]
- *Maintenance Assurance Procedure* – communicated to ROMP (Reliability, Operations, Maintenance and Process) team members, with a focus on utilising and testing the new procedure).
- *Treatment Asset Management Awareness* – a training module presented to the Reliability Engineer (RE) Team (for example).

[444] Sydney Water, *Standard; Condition Assessment Standard* (Version 1), February 2022 (file: *3e - D0002014 Condition Assessment Standard.docx*).
[445] MS Excel workbook: *3e - DOC0328 Mechanical and Electrical Like for Like field based decision framework form.xlsx*.
[446] Sydney Water, *Decision Framework; Reservoir Major Periodic Maintenance* (Version 6), 18 August 2021 (file: *3e. AMQ0552 Reservoir Major maintenance Decision Framework.docx*).
[447] Sydney Water, *Business Case Guideline* (Version 3), 1 July 2023 (file: *3e. 2936429 Business Case Guideline.docx*).
[448] Document: *6c - CT1713 - WT41 Renew Non-Ionic Polymer - Seed Funding - APPROVED.pdf*.
[449] Document: *6c - L4L pmp8107.pdf*.
[450] MS Excel workbook: *4. Compass Report- Attendance for Finance for Non-Finance Managers Training.xlsx*.
[451] MS Excel workbook: *4. Compass Report- Attendance for Lead Others in an Asset Management Environment (NAT10976002).xlsx*.
[452] Sydney Water, *Procedure; How to use AP Tool* (Version 1), 9 February 2024 (file: *4 - How to use AP Tool.docx*).

- *Operational Service Planning* (OSP) – this new planning approach is being shared with /communicated to Heads of Business, ETS maintenance and renewals teams and the Facility Programs team within the Reliability and Maintenance improvement team (for example).

Some of this training has been implemented subsequent to the audit but nonetheless demonstrates an ongoing commitment to continuous improvement.

Monitoring and Review:

Sydney Water demonstrated that its Asset Management System continues to be consistent with ISO 55001:2014 by providing evidence of continuing certification by an external body. The current *Certificate of Registration*[453] has an expiry date of 11 June 2025. The report on the most recent surveillance audit,[454] which was conducted in March 2024, identified no nonconformities or opportunities for improvement in respect of the Asset Management System.

As also reported in **section 3.2.3.1** (in respect of previous recommendation 2023-10), Sydney Water has developed a *Maintenance Assurance Procedure*[455] and increased the number of assurance audits being undertaken. Furthermore, it noted that a review of asset management system implementation is now being incorporated as part of drinking water and recycled water management systems audits.[456] As examples, Assurance Summary reports in respect of the following were provided:

- Assurance audit in respect of "Air Valve (asset # 8694593)/SP0797 Port Kembla Rising Main" to ensure that Regional Delivery Consortia "*Contractors are undertaking preventative maintenance activities as per Job Plan: Z-GEN017-V1*" – audit undertaken on 13 July 2023; no non-conformances, but improvement opportunities and observations recorded.[457]
- Assurance audit in respect of "SP0900- Sewage Pumping Station – Regentville" to provide "*Independent site validation of SW owned poles and any other assets that can fall and harm people*". The audit assessed whether poles and other assets that can potentially fall are correctly documented in Maximo with an effective maintenance strategy. Two major non-conformances were recorded; a vent shaft was not recorded in Maximo (or Hydra) and there were no documented maintenance/inspection requirements; and there were no documented maintenance/inspection requirements for a LV (low voltage) pole at the site.[458]
- Assurance audit in respect of "Orchard Hills and Warragamba Hub maintenance and renewal processes", the objective of which was to "*Assess compliance with the Asset Management maintenance and renewals processes in place and measure its effectiveness of risk controls with respect to Sydney Water's Enterprise risks – to protect public health*". Three minor non-conformances were recorded (in relation to capital investment decision making, records in respect of statutory equipment maintenance, and maintenance tags) and eight opportunities for improvement were identified.[459]
- Assurance audit in respect of the Macarthur WFP (operated under a BOOT arrangement), the objective of which was to "*To verify contract compliance of Macarthur WFP build owned operated transfer (BOOT) operations against the contract terms and conditions relating to the execution of the TRILITY Asset Management Plan coming up to the 5 year Transfer period of the contract; Testing of the compliance to the previously approved, TRILITY Asset Management Policy presented to SWC, which specified that TRILITY align their Asset Management practices to ISO55001*". No

[453] BSI, *Certificate of Registration; Asset Management System – ISO 55001:2014* (file: *2b. AMS Certificates 2022-2025.pdf*).
[454] BSI, *Assessment Report; Sydney Water Corporation*, 4 March 2024 to 20 March 2024 (file: *2b. STD2401-00 BSI March 2024 audit report 2024 audit report.pdf*).
[455] Sydney Water, *Procedure; Maintenance Assurance Procedure* (Version 1), 4 September 2024 (file: *D0002385.docx*).
[456] Sydney Water response to 2024 Audit Questionnaire (file: *2023-24 OL Audit Questionnaire.docx*).
[457] Document: *AV8694593 – Audit.docx*.
[458] Document: *SP0900 - Audit 20240719.docx*.
[459] Document: *10 Orchard Hills and Warragamba WFP AM Audit Report 23_24.docx*.

non-conformances or improvement opportunities were identified. It is noted that such audits are an important component of managing partners engaged under such contractual arrangements.

Both internal and external audits are essential to monitoring the effectiveness of Sydney Water's Asset Management System and its implementation.

State of the Assets:

Further to the above comment, another important measure of the effectiveness of the Asset Management System is the annual *State of the Assets* report,[460] which provides an assessment of asset condition and performance across the whole of the asset portfolio. As summarised in the report:

> "*The performance of water and wastewater treatment facilities and networks remained stable with minor improvements in FY24 compared to previous years. The forecast for FY25 is an improvement in performance supported by an increase in investment in poorer performing areas.*"

This report provides an overview of the asset management approach as implemented during the year; an assessment of performance, asset condition and system health; a review of the recent past and short-term future investment profile; and an assessment of the current risk position. It provides a robust assessment from both product and asset class perspectives.

Infrastructure Performance in National Parks:

In feedback provided to IPART in respect of the scope of this audit, DCCEEW (Department of Climate Change, Energy, the Environment and Water) raised concerns regarding the impact of Sydney Water infrastructure, particularly sewerage infrastructure, on the National Park estate. It suggested that sewerage infrastructure requires upgrade and repair to avoid the impact of sewage leaks and overflows.

Sydney Water provided an extensive portfolio of documentation (not specifically referenced for the purposes of this report) and outlined during the audit interviews the actions it takes in respect of infrastructure located in National Parks. The following points are noted:

- Sydney Water has more than 400 online wastewater monitoring points located within National Parks.
- Sydney Water has strict Notification Protocols that include major agency notification of incidents that have the potential to impact National Parks or other areas of environmental value; it also has processes and procedures that are implemented in response to an incident.
- Sydney Water inspects critical infrastructure, including infrastructure within National Parks. Small pipes that could impact on waterways are proactively inspected; data from the abovementioned monitoring informs inspection programming.
- All infrastructure and associated work orders are mapped on Sydney Water's GIS, which includes overlays that identify areas of environmental/ecological value including national parks. The Choke Management Program is implementing a risk informed prioritisation of Sewer Catchments Area Management Plans (SCAMPs) that uses National Parks layer with a high weighted value to prioritise preventative maintenance in National Parks in accordance with the probability of failure (choke).
- To address access constraints, Sydney Water is trialling the use of continuous relining when intervention (sewer renewal) is required in National Parks. A trial conducted in Garigal National Park has been used as a case study to inform future decision making in respect of proactive asset replacement versus reactive maintenance in areas of restricted access.

[460] Sydney Water, *State of the Assets Report FY2024* (Version 1), 12 May 2024.

In summary, Sydney Water has in place mechanisms to monitor and proactively inspect wastewater assets located in National Parks. Preventative maintenance and, where required, replacement is prioritised using a weighted value assessment.

Summary:

In summary, Sydney Water continues to have appropriate guidance in place for each phase of the asset management lifecycle. Evidence provided, together with the field verification observations, confirms that management of the assets is undertaken generally in accordance with the documented procedures.

Improvement Initiatives

General:

Sydney Water continued to implement a series of improvement initiatives during the audit period, with a focus on those being implemented under the *Service Excellence Framework*. These improvements have further evolved in conjunction with an organisation-wide realignment designed to create a more integrated, accountable, and customer-focused approach to product and asset management, which has been implemented during the audit period.

As explained by Sydney Water during the audit, there has been a realignment of the asset management framework and controls; Asset Management Objectives have been realigned to new Sydney Water objectives with a focus on service delivery to customers based on their priorities; the Service and Asset Value Chain has been enhanced to improve the ways of working; and a new set of Infrastructure Strategies that reflect the integrated lifecycle, its products and associated assets has been developed.

Targeted improvements such as finalising update of the reservoir inspection procedures, and others mentioned briefly throughout this report or discussed during the audit interviews, have also been implemented.

Service Excellence Framework:

The *Service Excellence Framework* and its objectives were explained and reported in some detail as part of the 2023 Operational Audit. The *Service Excellence Road Map* outlined a program of improvement themes and associated activities to be implemented over a three phase/three-year timeline, with completion aimed at June 2024.

These *Service Excellence* improvements were delivered in five workstreams. In the *Final Progress Report on IPART Deliverables*,[461] Sydney Water reported that it delivered 21 of the 22 planned deliverables. The final deliverable, full implementation of an assurance process for maintenance and renewals, has been delayed with completion expected by 30 June 2025.

Some of the specific improvements made during the audit period include (for example):[462]

- Development and implementation of the *Performance Cost and Risk (PCaR) Framework*,[463] which is aimed at driving asset performance with a particular focus on decision making to meet customer outcomes
- Further development and implementation of the Asset Performance Tool (APT), which is used to monitor and provide performance visibility, including by monitoring metrics such as maintenance completion (see below for further discussion).
- Design of a Business-Critical Projects Assessment Tree which provides a clear risk hierarchy to inform internal stakeholders of the impact of significantly important projects in prioritisation decision making.

[461] Sydney Water, *Asset Service Excellence; Final Progress Report on IPART Deliverables*, August 2024.
[462] Document (PowerPoint presentation): *AMS 2024 IPART OL Audit.pdf*.
[463] Sydney Water, *Performance Cost and Risk (PCaR) Framework*, 29 May 2024.

- Reshaping of maintenance and renewal planning processes through the Operational Service Planning Improvement Project (refer **section 3.2.3.1** for further details).
- Development of a *Maintenance Assurance Procedure*[464] (refer **section 3.2.3.1** for further details).

It is evident that the benefits of these and other improvements are now being realised, as demonstrated by the North Head Maintenance Optimisation case study presented during the audit interviews.[465] The enthusiasm of the staff who presented at the audit further attests to this assessment.

Infrastructure Strategies:

As previously reported, Sydney Water has now adopted and is implementing a series 'Infrastructure Strategies' which will replace the current 'Asset Class Plans'. This initiative is aimed at a more integrated approach to managing the asset lifecycle, as opposed to a tendency toward a silo attitude under a regime focussed on classes of assets.

A structure comprising eight strategies, each of which encompass several of the previous 'asset classes', has been developed. These include:

- *Water Production Infrastructure* – which encompasses Water Filtration Plants and Desalination Plants;
- *Water Delivery Infrastructure* – Pumping Stations, Transfer Mains and Reservoirs;
- *Water Distribution Infrastructure* – Distribution, Pressure Management and Customer Connection;
- *Wastewater Collection Infrastructure* – Wastewater Connection, Gravity System and Pressure System;
- *Wastewater Transfer Infrastructure* – Wastewater Pumping Stations, Pressure Mains and Truck Sewers (including storage);
- *Resource Recovery Infrastructure* – Water Resource Recovery Facility, Effluent Discharge and Solids Removal;
- *Stormwater Drainage Infrastructure* – SQUID, Pumping Stations, Channels, Naturalised and Storage; and
- *Recycled Water Infrastructure* – Purified Recycled Water Treatment Plant, Advanced Recycled Water Treatment Plant, Pumping Stations, Reservoirs and Distribution.

Review of the *Water Production Infrastructure Strategy*[466] (for example) reveals that it is in part reflective of the information contained in the *Asset Class Plans*, but with a greater focus on the wholistic/integrated management of the asset portfolio to meet objectives than on specific assets/asset classes. It also reflects engagement of the more recently developed/improved approach to asset management (i.e. initiatives implemented under the service excellence program) such as Performance, Cost and Risk (PCaR) assessment and Consequence of Failure (CoF) analysis. The strategy has been developed with an improved understanding of:

- The role of the infrastructure grouping (in this case the water production infrastructure from a broader service context).
- The asset types that are included (water filtration plants, raw water chlorination, raw water pumping stations and other ancillary facilities).

[464] Sydney Water, *Procedure; Maintenance Assurance Procedure* (Version 1), 4 September 2024 (file: *D0002385.docx*).
[465] PowerPoint presentation: *2a. North Head Maintenance Optimisation Comms Overview-v0.2.pptx*.
[466] Sydney Water, *Water Production Infrastructure Strategy* (Version A), 14 September 2024 (file: *Water Production Infrastructure Strategy.pdf*).

- Levels of service, with clear identification of the relevant drivers.
- Growth profile and projection.
- Asset Performance and Health.
- Key Issues and Risks.
- Investment Requirements.

Explanation provided by Sydney Water reinforces the 'whole of system' benefits to be realised through adoption of a more integrated approach, which is strongly supported.

Asset Performance Tool:

The Asset Performance Tool (APT), which is used to monitor and provide performance visibility, including by monitoring metrics such as maintenance completion, was further developed during this audit period. Furthermore, as previously reported, a *How to use AP Tool* procedure has been developed and training delivered.

A series of screenshots showing records of breakdown maintenance related to the sites visited during the audit were provided as examples. The total number of BM work orders by process unit is shown, together an indicator of failure rates (still subject to validation).[467]

Based on observations to date, the online based APT is proving to be a valuable mechanism for 'live' monitoring asset performance.

Updated Reservoir Roof Inspection Procedure:

As reported in respect of the 2023 Operational Audit, Sydney Water demonstrated that it had recently reviewed its Level 0 reservoir inspection process/checklist to give more specific guidance for undertaking inspections and the actions to be taken take if issues are identified (including raising work orders and the priorities to be assigned). The updated process had been documented in a new *Level 0 Reservoir Inspection Process*, which included an *Inspection Process Map*, that clearly outlines the inspection and follow-up process.

As discussed in **section 3.2.1.1** (in respect of previous Recommendation 2022-03), the procedure and associated reporting arrangements have now been finalised in conjunction with NSW Health and are being implemented (note previous commentary in respect of maintenance implementation at Faulconbridge Reservoir).

Field Implementation:

General:

Field verification visits were undertaken to four sites/facilities to verify how effectively Sydney Water is implementing the requirements of its AMS in practice. The notes presented in **Appendix B** provide an overview of the observations made during the site inspections; the following discussions provide further detail in respect of some specific issues/aspects of implementation.

It is also noted that, although not specifically reported, additional documentation provided by Sydney Water in response to the auditor's requests has been viewed and taken into account in considering the overall assessment of compliance with this obligation.

Cascade Water Filtration Plant (WS 0476):

Filter Refurbishment (MPM)

As reported in **Appendix B.2**, Filter No 6 was removed from service for refurbishment under the Major Periodic Maintenance program, with Filter No 1 having been completed during the audit period. Review of the MPM program shows that refurbishment is being carried out

[467] Document: *API Tool Audit Screen Shots.pdf.*

broadly as programmed, albeit with some delay; Filter No 5 is scheduled for refurbishment during 2024/25. Maximo work order records (W/O 86969423, 86969414 & 89440976 respectively) for these projects were provided on request.[468]

MPM work order records for the Katoomba No 1 treated water pump WP0330PMP5201 (W/O 84009823) and Catalina No 2 treated water pump (W/O 84009879) were also provided.[469]

Renewal/Upgrade Projects

A sample of records associated with the upcoming program of five projects aimed at renewal/upgrade of the facility have been discussed previously in respect of "Asset Creation".

Fluoridation Related Equipment

To inform the assessment of compliance with the requirements of the Fluoridation Code (refer **section 2.2.3.1**), asset records in respect of the flowmeter upon which dosing is based and the fluoride dosing pump were sought. Records provided included the following:

- Flowmeter:
  - *WF0527_2024-Twin Weir MRS Maximo Record*[470] – record of maintenance work order completed on 1 May 2024. The "Parameters Task" section indicates that parameters (presumably calibration settings) match setup parameters.
  - *Clearwater Tank Transducer Arrangement*[471] – a drawing illustrating the location /arrangement of the 'in channel' flow transmitter was sought to enable an assessment of accuracy for flow paced dosing. The drawing shows that the transmitter records level in a baffled vertical tube/monitoring chamber. Although there was a question about the impact of channel draw down as the flow drops into clear water tank, a 6570mm long 'feeder tube' arrangement that lies upstream of the monitoring point should ensure that the recorded depth of flow (and therefore flow rate) is reflective of "normal flow depth'.
- Dosing Pump:
  - *WT0041PMP7571 Model*[472] – this appears to be a screenshot from Maximo. Note the detail at the top: "*Pump – Dosing – Duel Head, 3.32 G/h, 10.7 L/h, 232psi*", which provides some indication of capacity; however, the flow rates (G/h v's L/h) don't align (see comment below) (note US gallons). The model number is also provided.
  - *WT0041PMP7571 - Technical data sheet*[473] – provides technical details for full range of pumps, which includes the unit installed at the Cascade WFP.
  - *ProMusO&M_12_7_05.pdf*[474] – an operating manual that again provides technical information for the full range of pumps. This includes a description of the '*Stroke* Adjuster Component' and commentary in respect of 'Pump Accuracy', both of which were of interest in assessing pump suitability for the fluoride dosing installation.

Chemical Storage Area

During the site inspection, it was noted that the bunded chemical storage areas are not roofed and are therefore open to rainfall. In response to the auditor's enquiry regarding draining of these areas, Sydney Water advised as follows:

[468] Document: *Cascade WFP MPM Workorder MAXIMO.pdf.*
[469] Document: *Cascade WFP MPM Workorder MAXIMO.pdf.*
[470] Document: *WF0527_2024-Twin weir MRS.pdf.*
[471] Document: *Clearwater Tank Transducer Arrangement.pdf.*
[472] Document: *WT0041PMP7571 Model.png.*
[473] Document: *WT0041PMP7571 - Technical data sheet.pdf.*
[474] Document: *ProMusO&M_12_7_05.pdf.*

- Chemical bund checks are part of the daily operational inspections, as evidenced by the *Cascade WFP Rounds Sheet.*[475]
- Water in the bund is pH tested prior to discharge, which is managed in accordance with the *Cascade WFP; Discharging Water to the Environment Work Instruction.*[476]
- Weather forecasts are checked daily, so rainfall is predictable.
- Covering of the outdoor chemical area is not identified as a requirement.

Summary

On the basis of the above and previous (in this report) observations, it is apparent that asset management practices are being appropriately implemented at the Cascade WFP.

Quakers Hill Water Resource Recovery Facility:

As reported in **Appendix B.4**, a detailed review of the Maximo maintenance management system as it applies to the Quakers Hill WRRF. This revealed a well-structured hierarchy that covered the full scope of the facility. The following examples provide evidence that the assets are being appropriately maintained:

- Records in respect of calibration of CCP Turbidity instrument ATU7260 were viewed online, including:
  - PM 10065286 for annual calibration and maintenance of filter effluent turbidity instrument by external service provider.
  - PM 10046630 for monthly inhouse calibration. Records indicated that this had been completed nominally monthly.
- As evidence that statutory inspection and maintenance is carried out, Sydney Water provided:
  - A photograph showing a Certificate of Inspection affixed to a pressure vessel.[477]
  - Certificates of Inspection for Hydropneumatic Vessel - Plant No. TNK 7534; Vertical Air Receiver - Plant No. VSL 4801 - Blower House; Vertical Air Receiver - Plant No. VSL 4802 - Blower House; Hydropneumatic Vessel - Chlorination Area; Horizontal Air Receiver - Plant No. CPR9001 – Dewatering; and Horizontal Air Receiver - Plant No. CPR9400 – Dewatering.[478] In all cases, the inspection was undertaken on 19 July 2023 and the certificates are valid for a two-year period.
- In response to the auditor's request, details of the alarm condition that resulted in corrective work order CM W/O 91792759 was provided. An email message indicating that "*I raised WO-91792759 for Out loading Bay 3- slide gate VLV -SLG 903C is not working in Auto. It was tripped in the morning and it tripes/e CFG sequence many time. Need to be rectify at earliest*", and which included a SCADA screenshot showing the valve location, was provided.[479] The work order record indicated "Stripped air cylinder and slide gate adjusted and lubricants to air cylinder now working correctly" as the work completed; details of the failure (problem, cause, remedy) were also recorded.
- A package of maintenance records in respect of filter cleaning of Tertiary Filter ST0018-FLT, which is undertaken every four months. Records indicate that the work was completed in April 2023, was deferred in October 2023 and again in February 2024 due to "*Filter channel leak rectification project in progress, unable to provide required isolation for the PM*", and

[475] Document: *Cascade Rounds Sheet.pdf.*
[476] Document: *WTCS 5017.docx.*
[477] Document: *QH Photo Pressure Vessel with certificate.jfif.*
[478] Document: *QH Pressure Vessel Inspection Cert - Jul 23.pdf.*
[479] Document: *SCADA Alarm - CM WO -91792759.msg.*

completed in August 2024.[480] W/O 92074624 provided the record of the last instance; Safe Work Method Statements and Confined Space Entry Permit were appended.[481]

Summary:

The field verification site visits revealed that the infrastructure (asset portfolio) is generally well operated and maintained from an asset management perspective. Field personnel demonstrated a high level of competency, understanding and knowledge of the assets that they operate and maintain.

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this obligation.

[480] MS Excel workbook: *Filter clean out PM WO List - FY 23-24.xlsx*.
[481] Document: *Filter Clean PM WO 92074624.pdf*.

2.4 Information and Services for Competitors (Licence Part 8)

2.4.1 Negotiations with WIC Act licensees and Potential Competitors (clause 8.1)

2.4.1.1 Negotiations with WIC Act licensees and Potential Competitors (sub-clause 8.1.1)

Sub-clause	Requirement	Compliance Grade
8.1.1	Sydney Water must negotiate the provision of Services to WIC Act licensees and Potential Competitors in Good Faith.	 **Compliant**

Risk if non-compliant

Failure to comply with the requirements of this obligation presents a high risk that services may not be provided to properties that require them where the services are to be provided by a WIC Act Licensee or Potential Competitor. Ultimately, this may present a risk to public health or the environment.

Evidence sighted

Refer Appendix C (C.2.8).

Summary of audit findings/reasons for grade

Sydney Water advised that, during the audit period, it had received requests to negotiate services and requests for information regarding seven different existing and potential future schemes that are or might in the future be operated by WIC Act licensees or Potential Competitors. These requests related to three existing schemes, two of which are currently licensed under the WIC Act, and four potential schemes.

On the basis of the evidence provided, it appears that Sydney Water has responded to and, to the extent required, negotiated in good faith in response to these requests.

On this basis, Sydney Water is assessed to have demonstrated compliance with this obligation.

Areas of good practice observed

Sydney Water demonstrated an ongoing commitment to supporting alternative water and wastewater servicing schemes to the extent compatible with its own servicing obligations. It is also committed to ensuring that arrangements for the supply of water from the Sydney Desalination Plant remain appropriate to the evolving water servicing strategy for Greater Sydney. Its ongoing commitment is considered reflective of good practice.

Discussion and notes

This clause requires Sydney Water to negotiate the provision of services with WIC Act Licensees and other competitors in good faith, where requested.

Sydney Water advised that it had "*received requests to negotiate services and requests for information regarding seven different existing and potential future schemes that are or might in the future be operated by WIC Act licensees or Potential Competitors*" during the audit period. It also received a request for general information that was no longer publicly available, specifically copies of draft reports that had been replaced on its website with the final versions.[482]

[482] Sydney Water response to 2024 Audit Questionnaire (file: *2023-24 OL Audit Questionnaire.docx*).

Sydney Water further advised that:

- "*For three of the existing schemes, dialog between the scheme's proponents, related Government representatives and Sydney Water is ongoing and began before the audit period.*"
- "*Requests for information and negotiation for the four new schemes were initiated during the audit period, with the exception of the Besmaw development in Cronulla, where the developer submitted a feasibility application in March 2023.*"

Details of Sydney Water's interactions with WIC Act Licensees and Potential Competitors are provided in its annual *WIC Act licensees and potential competitors relationships report.*[483] Much of the information provided therein is drawn from the *WIC Act licensees and potential competitors relationships evidence summary 23-24*,[484] which provides a chronological record of interactions (correspondence and meetings) in respect of each existing and potential scheme.

Negotiations for the provision of services and other arrangements was undertaken in respect of:

- Rosehill Camelia recycled water scheme (existing scheme) – various discussions regarding options to improve value derived from the scheme, including, extension of the existing recycled water agreement;[485] long-term secondary effluent supply;[486] and a sewer mining agreement.[487]
- Sydney Olympic Park Authority (SOPA) (existing scheme) – discussions regarding potential transfer of the SOPA Water Reclamation and Management Scheme (WRAMS) to Sydney Water;[488] and participation in an Expression of Interest (EOI) process for the supply of potable top-up water.[489,490]
- Sydney Desalination Plant (existing scheme) – ongoing meetings/negotiations in respect of policy and contractual arrangements to facilitate operational flexibility consistent with the Greater Sydney Water Strategy;[491] and negotiations in respect of expansion of the Sydney Desalination Plant.[492]

[483] Sydney Water, *WIC Act licensees and potential competitors relationships report*, undated (file: *7. WIC Act Licensees and Competitor Relationships Report 2023-24.pdf*).
[484] Document: *Competitor relationships evidence summary 23-24.docx.*
[485] Documents: *Email -_External_ RE_ Conexa _ SW catch-up (Key principles shared) – 110923.msg*; *Email -RE_ _External_ RE_ Conexa _ SW catch-up (Commercial principles on extension) - 110723.msg*; and *Email -Feedback on Aquanet Contract Reset (Feedback on commercial principles) - 260923.msg.*
[486] Documents: *Email - Feedback on Aquanet Contract Reset (Secondary effluent supply) – 260923.msg*; *Email -RE_ _External_ RE_ Aquanet _ SW catch-up (SW feedback on secondary effluent supply terms) – 191223.msg*; *Email - RE_ _External_ RE_ Aquanet _ SW catch-up (Conexa feeback on SW terms) – 150124.msg*; *Email - RE_ _External_ RE_ Aquanet _ SW catch-up (SW feedback post 15 Jan) – 200224.msg*; *Email - RE_ _External_ RE_ Aquanet _ SW catch-up (Conexa seeking arbitration) – 010324.msg*; *and Email - RE_ _External_ RE_ AqauNet - Extending sewer mining arrangement beyond 2031 (PLACEHOLDER) – 190324.msg.*
[487] Documents: *Email - RE_ _External_ AquaNet - Extending sewer mining arrangement beyond 2031(SWC sent sewer mining agreement) – 270324.msg*; and *Email - RE_ _External_ AquaNet - Continuation of sewer mining (Conexa response to sewer mining agreement) – 210624.msg.*
[488] Documents: *Email - Direction from the Board (Indicate to SOPA not to go ahead with WRAMS Transfer) – 11102023.msg*; and *Email - RE_ Direction from the Board (EOI notification) – 281123.msg.*
[489] Documents: *Email - RE_ Direction from the Board (EOI notification) – 281123.msg*; *Email - RE_ _External_ Update_ SOPA Recycled Water EOI – 23042024.msg.*
[490] Sydney Water, *Expression of interest for recycled water supply at SOPA - TRSOPA23593*, February 2024 (file: *Doc0001-Sydney Water SOPA EOI response_Final_010224.pdf*).
[491] Document: *External CommercialFinancial Weekly Meeting with Sydney Desalination Plant.msg.*
[492] Documents: *SDP Expansion - Risk and opportunities discussion (DPESWCNSWTSDP).msg*; and *External OFFICIAL Sensitive NSW Government_ SDP PEP Assessment.msg.*

- Wholesale wastewater Services at Glossodia (Altogether Pty Ltd) – discussions regarding a connection for the temporary disposal of effluent from a proposed scheme. Sydney Water's network at the proposed connection location is operating at capacity.[493]
- Wholesale water and wastewater services at Appin (Conexa) – negotiation of terms and conditions (including pricing) for the transport, treatment and disposal of excess recycled water associated with a new development.
- Sewer mining or recycled water supply at Quakers Hill (Conexa) – request for preliminary information in respect of sewer mining or the supply of recycled water.[494]
- Planning Proposal notification for Besmaw in Cronulla (Sutherland Council) – response to Council request to connect a proposed development to wholesale water services.[495,496]

Sydney Water noted that, in assessing proposals it had taken long-term planning into consideration, including factors such as (for example):

- Its inability to commit to long term supply of secondary effluent beyond 2031 (relates to the Rosehill Camelia scheme) or sewer mining.
- Impact and cost effectiveness of proposals when considering whole of Sydney servicing.
- Long-term interest of customers from both servicing and financial perspectives.
- Consistency with Sydney Water's corporate risk parameters.

Sydney Water's reporting indicated that, although it had engaged in negotiations in respect of the provision of services, no new agreements for the provision of services to WIC Act Licensees or Potential Competitors were established/entered into during the audit period.[497]

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this obligation.

[493] Documents: *Email-FW_ _External_ Re_ Glossodia - 161023 and 241023.msg*; *Email-RE_ _External_ Re_ Glossodia – 061223.msg*; *Email-Re_ _External_ Re_ Glossodia – 111223.msg*; *Email-RE_ _External_ Re_ Glossodia – 210324.msg*; *Email-RE_ _External_ Re_ Glossodia – 080424.msg*; *Email-Re_ _External_ Re_ Glossodia – 250524.msg*; *Email-Fwd_ _External_ Re_ Glossodia 190724.msg*; *AG letter to SWC 31Jul24.pdf*; *215522 103 Spinks Rd, Glossodia - Feasibility Application.msg*; and *215522 103 Spinks Rd, Glossodia - Feasibility Application URGENT 02_08_24.msg*.
[494] Documents: *Email- _External_ FW_ Request for Recycled Water Supply or Sewer Mining at Quakers Hill STP 010724.msg*; and *Email - RE_ External_ Re_ Request for Recycled Water Supply or Sewer Mining at Quakers Hill STP 230724.msg*.
[495] Document: *Besmaw - Altogether Utilities Servicing Strategy.pdf*.
[496] Document: *3 April 2024 Sydney Water response - 251, 260R, 278, and 280-282 Captain Cook Drive, KurnellV signed.pdf*.
[497] Sydney Water, *WIC Act licensees and potential competitors relationships report*, undated (file: *7. WIC Act Licensees and Competitor Relationships Report 2023-24.pdf*).

2.4.2 Code of Conduct (clause 8.3)

2.4.2.1 Code of Conduct (sub-clause 8.3.1)

Sub-clause	Requirement	Compliance Grade
8.3.1	Sydney Water must use its best endeavours to cooperate with each WIC Act licensee to establish a code of conduct required by a WIC Act licence where Sydney Water has received a written request from the WIC Act licensee to establish such a code.	 **No Requirement**

Risk if non-compliant

Failure to comply with the requirements of this obligation presents a high risk that services may not be provided to properties that require them where these services are provided by a WIC Act Licensee. Ultimately, this may present a risk to public health or the environment.

Evidence sighted

Refer Appendix C (C.2.9).

Summary of audit findings/reasons for grade

Sydney Water advised that no WIC Act Licensees had sought to establish a code of conduct during the audit period, and there was no indication to the contrary. Accordingly, it is assessed that there was no requirement for compliance with this obligation during the audit period.

Areas of good practice observed

There was no requirement to comply with this obligation during the audit period. Accordingly, there was no opportunity to assess Sydney Water's related practices.

Discussion and notes

This clause requires Sydney Water to use its best endeavours to establish a code of conduct, as required by a WIC Act licence, if requested by a WIC Act licensee.

Sydney Water indicated that it had received no such requests during the audit period.[498],[499] Review of the evidence provided in respect of sub-clause 8.1.1 (refer **section 2.4.1.1**) did not suggest anything to the contrary; nor did a review of the list of WIC Act Licence applications and variations currently published on IPART's website.

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this obligation.

[498] Sydney Water response to 2024 Audit Questionnaire (file: *2023-24 OL Audit Questionnaire.docx*).
[499] Sydney Water, *WIC Act licensees and potential competitors relationships report*, undated (file: *7. WIC Act Licensees and Competitor Relationships Report 2023-24.pdf*).

2.5 Performance Monitoring and Reporting (Licence Part 10)

2.5.1 Reporting (clause 10.2)

2.5.1.1 Reporting – Compliance with Reporting Manual (sub-clause 10.2.2)

Sub-clause	Requirement	Compliance Grade
10.2.2	Sydney Water must comply with all of its reporting and auditing obligations set out in the Reporting Manual, including in relation to: a) water conservation and planning; b) performance standards for water quality c) performance standards for service interruptions; d) Customers and Consumers; e) information and services for competitors; f) critical infrastructure security; and g) performance monitoring and reporting. ***Note:*** *Paragraphs 10.2.2(a) to (e) only to be audited; IPART will check paragraphs (f) and (g).*	 **Compliant**

Risk if non-compliant

Failure to comply with the reporting and auditing obligations set out in the Reporting Manual presents a low operational risk. Failure to report has no direct impact on operational performance; however, compliant reporting enables independent monitoring by relevant regulators and promotes public confidence.

Evidence sighted

Refer Appendix C (C.2.10).

Summary of audit findings/reasons for grade

Review of an extensive portfolio of reports together with evidence of submission (typically email correspondence) provided by Sydney Water and inspection of the Sydney Water website revealed that, based on the information provided, Sydney Water complied with its reporting obligations during the audit period.

Accordingly, Sydney Water is assessed to have demonstrated compliance with this obligation.

Areas of good practice observed

Sydney Water has demonstrated compliance with this obligation. No specific areas of good practice have been identified; however, it appears that Sydney Water has robust mechanisms in place to ensure that reporting is prepared in accordance with both the contextual and timing requirements.

Discussion and notes

The *Reporting Manual*[500] requires reporting in respect of a range of matters, which are consistent with the matters identified under this obligation. Such reporting includes both 'periodic' reporting and 'as required' reporting pursuant to specific Licence obligations.

Sydney Water provided an extensive portfolio of reports together with evidence of submission (typically email correspondence) as evidence of compliance with this obligation. Considering reporting in respect of each of the matters identified for audit, this evidence included (for example):

- Water Conservation and Planning:
  - Periodic reporting – the annual *Water Conservation Report*[501] was submitted to both IPART[502] and DPE on 1 November 2023.[503]
  - As required reporting – there was no requirement to change the *Current Economic Method* during the audit period; accordingly, no reporting of any such change was required.
  - Publicly available documents – copies of the annual *Water Conservation Report*, the *Current Economic Method*, a 'plain English' summary of the *Current Economic Method*, and the economic level of water conservation were all available via link on Sydney Water's website ("Water Conservation" section of "Operating Licence – Setting out our responsibilities" page).[504]
- Performance Standards for Water Quality:
  - Periodic reporting:
    - *Quarterly Water Quality Monitoring Reports* for each supply zone/distribution area are available on Sydney Water's website (select "Water quality report" on the "Water analysis" page and enter address for which the relevant report is required).[505] Reports for the last four quarters are available.
    - *Quarterly Exception Reporting to NSW Health* for both Drinking Water and Recycled Water (for example for Q2 Drinking Water Report 2023/24)[506] were submitted to NSW Health via a shared Dropbox portal.[507]
    - *Monthly Reporting on Fluoride Monitoring to NSW Health* (for example for April 2024)[508] was submitted to NSW Health via a shared Dropbox portal.[507]
    - *Annual Compliance and Performance reporting* – both the *Annual Drinking Water Quality Compliance and Performance Report*[509] and *Annual Recycled Water Quality Compliance and Performance Report*[510] were submitted to both IPART[511] and NSW Health (via Dropbox portal) on 1 September 2023.
  - As required reporting:
    - *Incident and Emergency Reporting to NSW Health* – records from Sydney Water's Noggin incident management platform indicate that (for example):
      - *E.coli* detected at drinking water compliance site 14A Owen Street North Bondi was verbally notified to NSW Health at 10:30 AEDT on 28 December 2023;[512] and
      - *E.coli* positive in WS0470 Reservoir Nattai (0329-2023) was verbally notified to NSW Health at 10:30 AEDT on 28 December 2023.[513]

      An incident debrief in respect of a Cascade WFP Fluoride Overdose of 15 June 2024 indicates that NSW Health was notified at 10:45am and kept regularly updated during the day.[514] Notification was subsequently confirmed via email, with reference to earlier discussions, at 2:34pm on 15 June 2024.[515]

Sydney Water advised that (in respect of recycled water): "*There were no incidents and emergency notifications made to external stakeholders (NSW Health).*" during the audit period.[516]

- *Significant changes to Water Quality Management Systems* – there was no significant changes to either the *Drinking Water Quality Management System* or *Recycled Water Quality Management System* during the audit period; accordingly, no reporting of any such change was required.

- Publicly available documents – as reported above, copies of the *Quarterly Water Quality Monitoring Reports* are available on Sydney Water's website.

- Performance Standards for Service Interruptions:
  - Periodic reporting – the annual *Performance Standards for Service Interruptions Report* for 2022/23,[517] which reports on Sydney Water's performance against the Water Continuity Standard, Water Pressure Standard and Dry Weather Wastewater Overflow Standard, was submitted to IPART on 1 September 2023.[518]
  - As required reporting – no 'as required' reporting was due or otherwise required in respect of service standards for service interruptions during the audit period.
  - Publicly available documents – there are no public reporting requirements in respect of performance standards for service interruptions.

- Customers and Consumers:
  - Periodic reporting – there are no periodic reporting requirements in respect of customers and consumers.
  - As required reporting – no 'as required' reporting was due or otherwise required in respect of customers and consumers during the audit period.
  - Publicly available documents – required information/documents including the *Customer Contract*; communications that explain the *Customer Contract*; an explanation of Assistance Options for Payment Difficulties and Actions for Non-Payment; information concerning internal Complaints handling; and communications that list the external dispute resolution services available are available on Sydney Water's website.[519]

[500] IPART, *Manual; Sydney Water Reporting Manual* (Issue No: D), 20 April 2022.
[501] Sydney Water, *Annual Water Conservation Report; 2022-23*, undated.
[502] Document: *Email - Transmittal to IPART - Water Conservation Report 2022-23 and updated NWI Indicators Report 2022-23 - 1 Nov 2023.pdf.*
[503] Document: *Water Conservation Report 2022-23_transmittal email to DPE.msg* (including attachments).
[504] https://www.sydneywater.com.au/about-us/our-organisation/what-we-do/operating-licence.html.
[505] https://www.sydneywater.com.au/water-the-environment/how-we-manage-sydneys-water/safe-drinking-water/water-analysis.html.
[506] Sydney Water, *Quarterly Drinking Water Quality Monitoring Report to NSW Health; Second Quarter 2023-24; 1 October 2023 to 31 December 2023* (Final), 11 February 2024 (file: *Q2 2023-24 Quarterly Drinking Water Quality report to NSW Health Final.pdf*).
[507] Document: *Screenshot - WQ reports to NSW Health dropbox.docx.*
[508] MS Excel workbook: *Monthly Fluoride Report to NSW Health April 2024.xlsx.*
[509] Sydney Water, *Annual Drinking Water Quality Compliance and Performance Report 2023-24*, undated.
[510] Sydney Water, *Annual Recycled Water Quality Compliance and Performance Report 2023-24*, undated.
[511] Document: *Email - Transmittal to IPART - SW OL Reports 2022-23 (1 September reports) - 1 Sept 2023.pdf.*
[512] Document: *E.coli detected at drinking water compliance site 14A Owen Street North Bondi-08-Oct-2024.pdf.*
[513] Document: *E.coli positive in WS0470 Reservoir Nattai -08-Oct-2024.pdf.*
[514] Document: *Cascade WFP Fluoride Overdose Incident Debrief Report_Final 230824_DA.pdf.*
[515] Document: *Cascade WFP Fluoride Incident.msg.*
[516] Sydney Water response to 2024 Audit Questionnaire (file: *2023-24 OL Audit Questionnaire.docx*).
[517] Sydney Water, *Operating Licence 2019–23; Performance Standards for Service Interruptions Report 2022–23*, undated.
[518] Document: *Email - Transmittal to IPART - SW OL Reports 2022-23 (1 September reports) - 1 Sept 2023.pdf.*
[519] Individual references are not provided; however, availability of the required information/documents on Sydney Water's website has been confirmed by the auditor.

- Information and Services for Competitors:
  - Periodic reporting – the annual *Report on information and provision of services to WIC Act licensees and potential competitors* for 2022/23[520] was submitted to IPART on 1 September 2023.[521]
  - As required reporting – no 'as required' reporting was due or otherwise required in respect of information and services for competitors during the audit period.
  - Publicly available documents – the annual *Report on information and provision of services to WIC Act licensees and potential competitors* is available via link on Sydney Water's website ("Information and services to competitors" section of "Operating Licence – Setting out our responsibilities" page).[522]

Although not all reporting was assessed in detail, it appears that Sydney Water has adequately and appropriately addressed the requirements as set out in the *Reporting Manual*.

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this obligation.

[520] Document: *Report on information and provision of services to WIC Act licensees and potential competitors 2022-23.pdf*.
[521] Document: *Email - Transmittal to IPART - SW OL Reports 2022-23 (1 September reports) - 1 Sept 2023.pdf*.
[522] https://www.sydneywater.com.au/about-us/our-organisation/what-we-do/operating-licence.html.

2.5.1.2 Reporting – Environment Performance Indicators (sub-clause 10.2.3)

Sub-clause	Requirement	Compliance Grade
10.2.3	Sydney Water must: a) compile indicators of the direct impact on the environment of Sydney Water's activities (the **Environment Performance Indicators**). The Environment Performance Indicators must be consistent with the performance indicators specified in the Reporting Manual with an indicator number starting with 'E'; b) monitor and compile data on the Environment Performance Indicators, including data that allows a year to year comparison of the Environment Performance Indicators; and c) report on the Environment Performance Indicators in accordance with the Reporting Manual.	 **Compliant**

Risk if non-compliant

Failure to compile, monitor and report on an appropriate set of Environmental Performance Indicators presents a potential high risk to the environment. If the impact of Sydney Water's activities on the environment is not monitored the effectiveness of environmental controls cannot be determined and their adequacy assessed.

Evidence sighted

Refer Appendix C (C.2.10).

Summary of audit findings/reasons for grade

Sydney Water demonstrated that it compiles data and reports against Environment Performance Indicators including the IPART Environment Indicators (identified in the *Reporting Manual*) and the National Performance Report (NPR) Environment Indicators. It also demonstrated that it has suitable guidance and mechanisms in place to capture and compile the relevant data.

Accordingly, Sydney Water is assessed to have demonstrated compliance with this obligation.

Areas of good practice observed

Sydney Water has demonstrated compliance with this obligation. No specific areas of good practice have been identified; however, it is noted that Sydney Water publishes an *Annual Environmental Performance Report* as required pursuant to the *Sydney Water Act*; reports to the EPA as required in respect of its Environment Protection Licences; and voluntarily participates in the UN Global compact reporting. Collectively, this reflects an extensive portfolio of environmental reporting.

Discussion and notes

Sydney Water compiles data and reports against Environment Performance Indicators including the IPART Environment Indicators (identified in the *Reporting Manual*) as required under this obligation, and the NPR (National Performance Reporting) Environment Indicators. Performance against these indicators is reported to IPART annually in the *Environmental Performance Indicators Report*; the report for the 2022/23 reporting period[523] was submitted on 26 September 2023.[524]

Review of the *Environmental Performance Indicators Report* confirms that it reports against each of the IPART Indicators E1-E10 and the currently reportable NPR/NWI Environmental Indicators.[525] Indicators are grouped into six categories: Wastewater treatment and system discharges; Greenhouse gas emissions; Energy; Biosolids; Waste; and Native vegetation.

Indicator values for the current and previous four (4) reporting periods are provided, thereby enabling year-on-year comparison, as required. Commentary provides an overview of performance in each category, together with a discussion of factors that underlie identified performance changes.

It is noted that the *Environmental Performance Indicators Report* is included as an appendix to Sydney Water's *Annual Environmental Performance Report*,[526] which is published on Sydney Water's website (select link to report from the "Our environmental performance" section of the "Environmental protection" page).[527]

Evidence of the guidance and records used to compile the relevant data includes (for example) the following:

- All environmental indicators – the *Environmental Management Monitoring and Measurement Plan*[528] provides overall guidance in respect of data collection/compilation and calculation/determination of indicators.
- IPART Energy indicators E1 and E2 – data provided by Sydney Water's gas/electricity provider (BidEnergy) is captured and analysed in a series of spreadsheet models.[529]
- IPART Wastewater related indicators E3 and E4:
  - Compiled in accordance with guidance presented in the *Wastewater Overflows System Discharges PI Sheet*.[530]
  - Data is extracted from Sydney Water's Noggin incident management platform and analysed in a spreadsheet model.[531]
- IPART Biosolids indicator E5:
  - Compiled in accordance with *Biosolids Annual Procedure; Standard Operating Procedure*.[532]
  - Data captured from weighbridge and delivery dockets and analysed in a spreadsheet model.[533]
- IPART Waste indicators E6 and E7:
  - Waste generated and recycled data is sourced from various businesses across the organisation using a bespoke spreadsheet template.[534]
  - Data is compiled and analysed, and graphical representation prepared for inclusion in the relevant performance reports.[535]
- IPART Native vegetation indicators, E8, E9 and E10:
  - Waste generated and recycled data is sourced from various businesses across the organisation using a bespoke spreadsheet template.[536]
  - Data is compiled and analysed, and graphical representation prepared for inclusion in the relevant performance reports.[537]

Compilation of the NPR/NWI Environment Indicators has been assessed in detail in a separate *NPR Indictors Audit Report.*[538] All indicators were found to have been appropriately determined and reported

Sydney Water also complies with/participates in other environmental reporting regimes including:

- To the EPA as required in respect of its Environment Protection Licences (EPLs) for wastewater systems.
- Quarterly determination of an 'Environmental Impact Index' for internal reporting purposes and in support of the *Annual Environmental Performance Report* in which it reports against special objectives, as required pursuant to the *Sydney Water Act 1994*.
- Voluntary participation in the UN Global compact reporting.

These reporting regimes are not assessed for the purposes of this audit.

Recommendations

There are no recommendations in respect of this obligation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this obligation.

[523] Sydney Water, *Environmental Performance Indicators Report 2022-23*, undated.
[524] Document: *Email - Transmittal to IPART Environmental Performance Indicators Report 2022-23 (1 October report) - 26 Sept 2023.pdf.*
[525] Currently reportable NPR/NWI Indicators include IE1, E1, IE2, E2, IE3, E3, E8, IE9, E9, IE10, E10, IE11, E11, IE12, E12.
[526] Sydney Water, *Annual Environmental Performance Report 2022-23; Incorporating our Special Objectives Statement*, undated.
[527] https://www.sydneywater.com.au/water-the-environment/what-we-are-doing/environmental-protection.html.
[528] Sydney Water, Plan; *Environmental Management Monitoring and Measurement Plan* (Ref: SWEMS0010, Version 21), 26 August 2024.
[529] MS Excel workbooks: *01 - Energy Reporting Master - 2023-24_V01.1.xlsx*; *02a - Electricity usage and spend.xlsx*; and *02b - Gas usage and spend.xlsx*.
[530] Sydney Water, *Operating Licence – Environment Indicator Report – PI Sheet; Wastewater overflows system discharges* (Version 1), 13 August 2020.
[531] MS Excel workbook: *E3 E4_FY23-24 - Noggin - MH Network Incidents.xlsx*.
[532] Sydney Water, *Biosolids Annual Procedure; Standard Operating Procedure* (Ref: RSMG0029, Version 06), 13 May 2022.
[533] MS Excel workbook: *E5 E8_FY23-24 biosolids.xlsx*.
[534] MS Excel workbook: *SWEMS0015.27.xlsx* (Sydney Water Resource Use and Recovery Report).
[535] PowerPoint slide: *Report Waste E6 E7 2023-24.pptx*.
[536] MS Excel workbook: *SWEMS0015.26.xlsx* (Sydney Water Native Vegetation Clearing and Rehabilitation Report).
[537] PowerPoint slide: *Report Native Vegetation E8 E9 E10 2023-24.pptx*.
[538] Cobbitty Consulting, *Independent Assurance Practitioner's Audit Report* (Version 2.0), 20 January 2025 (file: *#20047.002 – Sydney Water 2024 NPR Audit Report (Version 2.0).pdf*).

3. Previous Recommendations

3.1 Overview

This section sets out the detailed findings in respect of the status of previous recommendations. In each case the following is provided:

- the reference number for the previous recommendation;
- the previous recommendation;
- the assessed status (Complete, Ongoing or No action taken);
- a summary of the reason for the assessed status;
- a list of the evidence reviewed in assessing the status;
- discussion of the evidence reviewed and how it demonstrates the assessed status;
- any further recommendations; and
- any identified opportunities for improvement.

3.2 Detailed Assessment of Status

3.2.1 Drinking Water (clause 4.1)

3.2.1.1 Previous Recommendation 2022-03

Reference	Requirement	Status
2022-03	*Drinking Water (clause 4.1.3):* By 30 June 2023, develop a procedure to track and respond to exceptions to the reservoir roof inspection program, including a process to prioritise delayed inspections and provide alternate inspection arrangements if reservoir roof access is unsafe. Appropriate alternative inspection arrangements and timeframes for implementation should be included in the procedure and agreed to by NSW Health. Performance reporting to NSW Health is to be reviewed as part of this action, including reporting against the Drinking Water Quality Specification reservoir inspection target (90% of six monthly and three yearly inspections being completed annually) and in addition reservoirs that have not been inspected for over 12 months should also be reported.	**Completed**

Anticipated completion date

Not applicable – recommendation has been addressed.

Evidence sighted

Refer Appendix C (C.3.1).

Summary of findings/reasons for assessed status

Sydney Water has addressed this recommendation. A procedure to track and respond to exceptions to the reservoir roof inspection program has been developed. Alternative inspection arrangements are mentioned in the procedure. The procedure and exceptions reporting arrangements have been agreed with NSW Health.

Discussion and notes

Sydney Water undertook a review of the reservoir inspection process as part of the Service Excellence Accelerated Process Improvement (SEAPI) reservoir project, which was finalised in November 2023.

The recommendations of this project have been implemented, including updates to the inspection process, the tracking of inspections and alternative inspection processes. The updated inspection process (procedure),[539] including alternative inspection arrangements, were provided to NSW Health and discussed at the Q4 Health JOG held in November 2023.[540]

[539] D0002277 – Level 0 Reservoir Inspection Process.docx.
[540] JOG 2024 Q1 Item 2.1 2023 Q4 JOG Minutes – 13 November 2023.pdf.

Sydney Water has updated the *IMS502.01 - Drinking Water Product Specification*, with the six-monthly inspection clarified as the roof integrity process relevant to drinking water quality - routine reservoir inspection program. NSW Health has reviewed the updates to the *Product Specification*. Sydney Water has advised NSW Health that the JOG quarterly water quality updates will include exception reporting for the reservoir roof inspection program, as a part of the water quality hazard reporting processes.[541]

A record of the L0 reservoir inspections completed during the audit period was provided.[542] All reservoirs were inspected twice during the audit period as recommended in the L0 Reservoir Inspection Process guidelines; Level 0 inspections comprise of an external assessment of reservoir condition and integrity. The roof reservoir workplan from Maximo was provided.[543]

Further recommendations

There are no further recommendations arising in respect of this previous recommendation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this previous recommendation.

[541] Email-RE_External_RE JOG Action Item Reservoir Roof OL recommendation-260824.msg.
[542] AIS Reservoir Inspection 2023-24 YTD.xlsx.
[543] 23-24 Workplan-Program Breakdown (Asset).

3.2.1.2 Previous Recommendation 2023-01

Reference	Requirement	Status
2023-01	*Drinking Water (clause 4.1.3):* By 31 December 2024, Sydney Water is to ensure that there is a process in place to provide contractors performing network repairs with adequate training to undertake works to the specified hygienic requirements and protect water quality (e.g. hygienic storage and repairs, adequate flushing, testing etc). In addition, a process must be in place to verify that these practices are being implemented by contractors (relates to Element 3).	**Completed**

Anticipated completion date

Not applicable – recommendation has been addressed.

Evidence sighted

Refer Appendix C (C.3.1).

Summary of findings/reasons for assessed status

Sydney Water has addressed this recommendation. Training for the two contractors has been delivered, and ongoing training needs have been entered into Camms.

Audits (2 per year) have been undertaken and are planned to continue. These have also been scheduled using Camms.

Discussion and notes

Contractor awareness training has been implemented in March and April 2024 by the Water Quality Scientists. Training was provided to Linbeck[544] and Water Brothers[545] contractors. Additional training has been scheduled twice a year for each contractor until 2027 using Camms.[546]

The contractor audit criteria have been updated with input from Water Quality scientists to ensure training requirements are maintained ongoing. Two audits are planned per year; these have also been scheduled in Camms until 2027.[546]

Sydney Water advised that if an issue is identified during the audits, the corrective actions will be entered into Maximo.

Records of completed contractor audits for both Linbeck[547] (30 April 2024) and Water Brothers[548] (12 February 2024) contractors were provided.

It was noted from the evidence that Linbeck has included the training as part of its own internal induction program.[544]

[544] Email-FW External RE Water Quality presenting at Linbeck Contractors March Toolbox Talk-240724.
[545] Email-External RE Water Quality presentation-080824.
[546] Email-OL Audit Recommendations REC 2023-01 & REC 2023-09.
[547] Email-External Civil Contracts - Site Inspection Form Result #18804839-290424.
[548] Email-RE External Civil Contracts - Site Inspection Form Result #18514675-210424.

Further recommendations

There are no further recommendations arising in respect of this previous recommendation.

Opportunities for improvement

Two opportunities for improvement have been identified in respect of this previous recommendation; these are presented, together with the above discussion, in **section 2.2.1.1** (in relation to sub-clause 4.1.3, Element 7).

3.2.1.3 Previous Recommendation 2023-02

Reference	Requirement	Status
2023-02	*Drinking Water (clause 4.1.3):* By 31 December 2024, review implementation of the process for closing incidents and undertaking incident debriefs (internal and multi-agency) as per Sydney Water's Incident Management Procedure and Incident Debrief and Investigation Procedure and undertake an awareness session with all relevant staff to enable the procedures to be fully implemented (Element 6).	**Completed**

Anticipated completion date

Not applicable – recommendation has been addressed.

Evidence sighted

Refer Appendix C (C.3.1).

Summary of findings/reasons for assessed status

Sydney Water demonstrated that, by the time of final audit reporting, it had fully addressed this recommendation. The *Incident Debrief Procedure* and *Investigations Procedure*, which replace the *Incident Debrief and Investigation Procedure* have both been reviewed and updated. NSW Health has reviewed both procedures and its comments have been taken into consideration in the final versions.

Awareness sessions on the updated procedures have been undertaken with relevant staff.

Discussion and notes

Sydney Water has split the former *Incident Debrief and Investigation Procedure* into two separate procedures. The updated *Incident Debrief Procedure*[549] and *Investigations Procedure*[550] have been reviewed by NSW Health and its comments taken into consideration in developing the final versions.

The *Incident Debrief Procedure* was used for the fluoride incident at Cascade WFP on 15 June 2024. The debrief was conducted on 5 July 2024, within the stipulated timelines as per the procedure.

Awareness sessions outlining the provisions of the updated procedures (principally the *Incident Debrief Procedure*) were undertaken with all relevant staff on 23 October 2024, 30 October 2024, 4 November 2024 and 4 December 2024 (i.e. prior to this audit report being finalised).[551]

Further recommendations

There are no further recommendations arising in respect of this previous recommendation.

[549] 3060582 – Incident Debrief Procedure.docx.
[550] 3066049 Incident Investigation Procedure.
[551] Email dated 22 January 2025 from Sydney Water to Cobbitty Consulting (re: *REC 2023-02 - evidence of staff awareness session roll out*).

Opportunities for improvement

No opportunities for improvement have been identified in respect of this previous recommendation.

3.2.2 Recycled Water (clause 4.2)

3.2.2.1 Previous Recommendation 2023-03--

Reference	Requirement	Status
2023-03	*Recycled Water (clause 4.2.1):* a) By 31 December 2024, Sydney Water must amend its existing process for connecting properties to the recycled water network to ensure that avoidable cross-connections are eliminated. b) By 31 December 2024, Sydney Water should also quantify the public health risk of existing properties and put appropriate controls in place, which may include the auditing of existing connections. This review must be undertaken in collaboration with NSW Health and the Department of Fair Trading. (Relates to Element 3).	 **Ongoing**

Anticipated completion date

Part a) has been addressed.

It is anticipated that part b) will be completed by June 2025. This part of the recommendation requires additional time due to the time taken to liaise with stakeholders.

Evidence sighted

Refer Appendix C (C.3.2).

Summary of findings/reasons for assessed status

In respect of Part a), Sydney Water has reviewed its procedures and processes to manage the risk of avoidable cross-connections in new installations. A new manual, which includes requirements for the testing of new main to meter connections, has been prepared.

There has been some good progress on part b), which to date includes an audit of approximately 50 high risk properties for cross-connections; no cross-connections were found. A report has been prepared and sent to NSW Health and the Building Commission NSW regarding the risk assessment and current controls. Ongoing controls are to be agreed by all parties before this part of the recommendation can be closed out.

Discussion and notes

Part a):

Sydney Water's Change & Business Process team undertook a process mapping exercise to ensure that Sydney Water understands the end-to-end process of connections in recycled water areas, responsibilities and assurance checks.[552] The work was presented to NSW Health and Building Commission NSW[553] for consultation.

Sydney Water details the ownership and maintenance requirements for recycled water connections in the Customer Contract.[554] This indicates that the ownership and maintenance requirements of the property owner extend to the mains connection. The Building Commission is the plumbing regulator in New South Wales, and it states in documentation that it inspects plumbing from the property boundary.[555] Neither entity was taking responsibility for the mains to meter connections.

Sydney Water has implemented some additional controls to help manage the risk; these include:

- requiring its field test work instructions to include a checklist to confirm pipework for recycled water is colour coded;
- requiring its flow testers to spray paint the visible section of pipework that the meter connects with (risers) during inspection as a failsafe against plumbers mistaking which pipe to connect the meters to; and
- testing both recycled water and potable water pipes during flow testing.

Sydney Water has reviewed its procedures that relate to the connection of recycled water services and consolidating them into a manual, *Recycled Water Main to Meter Connection, Inspection and Investigation*.[556] This details the process for testing main to meter connections for cross-connections, through either main isolation or measuring conductivity, in Section 4. In addition, the manual will help to coordinate activities in-house between sections of the organisation and reduce the risk of errors.

It is noted that in February 2024, Sydney Water met with IPART and the Building Commission NSW to discuss regulatory responsibility. IPART subsequently wrote to the Minister in May 2024 noting a potential gap in responsibility for the main to meter property service.

Part b):

An audit of high risk recycled water properties has been undertaken for potential cross-connections. Criteria for connections with high public risk was set based on the size of the connection (>50 mm diameter), type of connections (schools, hospital, aged care homes and other vulnerable customers) and properties retrofitted with recycled water.[557,558]

Current controls include mains to meter check on installation, and coloured pipes for recycled water main.

A draft report has been prepared and is under review. The report includes high public risk properties of existing recycled water connections and controls in the Rouse Hill system. It was presented to NSW Health and the Building Commission NSW at an August meeting. This part will be closed out when the controls for existing schemes have been agreed. It is anticipated that this will be completed by 30 June 2025.

Further recommendations

There are no further recommendations arising in respect of this previous recommendation.

[552] Process Model Aris Report.
[553] Cross Connection NSW Health Presentation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this previous recommendation.

554 sydney-water-customer-contract-2024-28.pdf.
555 Local-pumbing-regulators-in-NSW.pdf.
556 WR5184 - Recycled Water Main to Meter Connection, Inspection, and Investigation.
557 RW cross conn. proc mapping memo -Sept 2024.
558 RW cross conn. risk assessment Sept 2024.

3.2.2.2 Previous Recommendation 2023-04

Reference	Requirement	Status
2023-04	*Recycled Water (clause 4.2.3):* By 30 June 2024, ensure stakeholder meetings are held at the required frequencies, especially those where an MoU has been developed (relates to Element 1).	**Completed**

Anticipated completion date

Not applicable – recommendation has been addressed.

Evidence sighted

Refer Appendix C (C.3.2).

Summary of findings/reasons for assessed status

Sydney Water demonstrated that stakeholder meetings are being held as required. Accordingly, this previous recommendation is considered to have been addressed.

Discussion and notes

Meetings were held with the Building Commission NSW (in accordance with the suggested frequency under the MOU). To ensure meetings are held on a quarterly basis, the chairing of meetings alternates between Sydney Water and Building Commission NSW, with an action on the upcoming chair to set the date for the next meeting. Meeting minutes were provided as evidence of the completion of meetings.[559]

As per the MOU, NSW Health was invited to and attended one meeting within the year; a representative attended the April 2024 meeting.

Further recommendations

There are no further recommendations arising in respect of this previous recommendation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this previous recommendation.

[559] Meeting Minutes – MOU Building Commission NSW 030424; Meeting Minutes – MOU Building Commission NSW 061223; Meeting Minutes – MOU Building Commission NSW 160124; Meeting Minutes – MOU Building Commission NSW 190923; Meeting Minutes – MOU Building Commission NSW 220823; Meeting Minutes – MOU Building Commission NSW 241023.

3.2.2.3 Previous Recommendation 2023-05

Reference	Requirement	Status
2023-05	*Recycled Water (clause 4.2.3):* By 30 June 2024, revise the risk assessment process to include a requirement to review the potential risk of overruns in the four yearly major risk assessment reviews. Overruns should be minimised, but where they are unavoidable the reasons for the delay should be documented, as well as the potential risk to Sydney Water in not thoroughly assessing the scheme within the four-year period and an estimated date that the risk assessment will be undertaken (Element 2).	**Completed**

Anticipated completion date

Not applicable – recommendation has been addressed.

Evidence sighted

Refer Appendix C (C.3.2).

Summary of findings/reasons for assessed status

Sydney Water demonstrated that it has improved the risk assessment process to reduce the potential for overruns. It has also included a requirement for Sydney Water to document the reason for a risk assessment being delayed.

Accordingly, this previous recommendation is considered to have been addressed.

Discussion and notes

A 3-year risk assessment cycle has been developed, as well as the implementation of a risk review for each scheme (between risk assessments as part of the WRRF risk reviews). The schedule is an appendix in the *Recycled Water Risk Assessment Workshop Procedure.*[560] This is a positive step; risk assessments are scheduled rather than trying to wait for an opportune moment.

A reference has been added to the schedule noting that Sydney Water will document any delay to the risk assessments, including reasons for the delay. There was an oversight, and the procedure does not request that the risk of the delay be assessed. This would consider things such as process or procedural change; if there had been a number of changes, there may be a higher risk to the delay than if activities are consistent with the last time the risk assessment was undertaken.

Further recommendations

There are no further recommendations arising in respect of this previous recommendation.

[560] D0001681 – Recycled Water Risk Assessment Workshop Procedure.

Opportunities for improvement

The following opportunity for improvement has been identified in respect of this previous recommendation:

- **OFI-SWC-2024-30:** In the *Recycled Water Risk Assessment Workshop Procedure* state that the risk of delays to the risk assessment schedule must be documented. This should consider things such as process or procedural change; if there had been a number of changes, there may be a higher risk to the delay than if activities are consistent with the last time the risk assessment was undertaken.

3.2.2.4 Previous Recommendation 2023-06

Reference	Requirement	Status
2023-06	*Recycled Water (clause 4.2.3):* By 30 June 2024, ensure that the Recycled Water Risk Assessment Workshop Procedure is followed, and risk assessment briefing papers include the review of data for problems using trends and charts (Element 2).	**Completed**

Anticipated completion date

Not applicable – recommendation has been addressed.

Evidence sighted

Refer Appendix C (C.3.2).

Summary of findings/reasons for assessed status

Sydney Water demonstrated that the risk assessment process has been updated to ensure that briefing papers include water quality trending as required by the AGWR. Accordingly, this previous recommendation is considered to have been addressed.

Discussion and notes

The *Recycled Water Risk Assessment Workshop Procedure*[561] has been revised to specify the requirements during a risk assessment workshop, including the analysis of water quality trends. As supporting evidence, a briefing paper for Gerringong-Gerroa[562] now includes trends and graphs for both key and irregular analytes in influent and effluent data. Risk assessment workshops for Gerringong were completed on 28 June 2024.

Further recommendations

There are no further recommendations arising in respect of this previous recommendation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this previous recommendation.

[561] D0001681 – Recycled Water Risk Assessment Workshop Procedure.
[562] D0000257.01 - Gerringong-Gerroa Briefing Paper.

3.2.2.5 Previous Recommendation 2023-07

Reference	Requirement	Status
2023-07	*Recycled Water (clause 4.2.3):* By 31 December 2024, remove the vegetation from the St Marys WRRF CCT. Review the maintenance planning process and prioritise maintenance for CCPs; ensure that the reason for any delays is recorded and assess the potential impacts on treatment performance (Element 3).	**Completed**

Anticipated completion date

Not applicable – recommendation has been addressed.

Evidence sighted

Refer Appendix C (C.3.2).

Summary of findings/reasons for assessed status

Sydney Water has removed the vegetation from the CCT at the St Marys WRRF. There has also been a change to the maintenance process to allow CCP activities to be prioritised.

Accordingly, this previous recommendation is considered to have been addressed.

Discussion and notes

The vegetation in the CCT at St Marys WRRF was removed on 30 May 2024; photographs of the cleaned CCT were provided as evidence.[563]

Critical Control Point (CCP) related assets have been reviewed[564] by the Reliability Operations Maintenance Program (ROMP) team. It can be seen that all WRRFs have been reviewed and action taken as required where vegetation is potentially causing issues.

CCP related assets have been tagged in MAXIMO so that they are easily identifiable. The Asset Performance Tool is being updated to include CCP maintenance monitoring. This will allow Sydney Water to easily see performance of maintenance activities and to prioritise and manage these activities proactively. This was reviewed during the audit interviews.

Further recommendations

There are no further recommendations arising in respect of this previous recommendation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this previous recommendation.

[563] St Marys WRRF – CCT 1.jpg: St Marys WRRF – CCT 2.jpg.
[564] Process Vegetation Inspection Summary 2024.xlsx.

3.2.2.6 Previous Recommendation 2023-08

Reference	Requirement	Status
2023-08	*Recycled Water (clause 4.2.3):* By 30 June 2024, ensure that all monitoring instruments, including handheld, are calibrated as required and appropriate records are maintained (Element 4).	**Completed**

Anticipated completion date

Not applicable – recommendation has been addressed.

Evidence sighted

Refer Appendix C (C.3.2).

Summary of findings/reasons for assessed status

Sydney Water demonstrated that the calibration of monitoring instruments has been improved, and calibration records are being maintained. Accordingly, this previous recommendation is considered to have been addressed.

Discussion and notes

The calibration procedures for plant handheld instruments and laboratory equipment are documented in BMIS document.[565]

A calibration action tracking progress report has been developed across the sites to track progress against required activities.[566]

Monitoring instruments, including handheld, are being calibrated as required, since completion of this recommendation. There were some omissions noted during the audit period at Quakers Hill WRRF; however, that was prior to the new process being implemented. Records for chlorine analyser 10459399 were provided as evidence.[567]

Further recommendations

There are no further recommendations arising in respect of this previous recommendation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this previous recommendation.

[565] D0001344 - Water Resource Recovery Common Laboratory Methods and Analysis Manual.
[566] Quakers Hill WRRF - Calibration of Field Equipment Schedule 2024-25.
[567] ACL8120 PM for FY 23-24 to present.xlsx.

3.2.2.7 Previous Recommendation 2023-09

Reference	Requirement	Status
2023-09	*Recycled Water (clause 4.2.3):* By 30 June 2024, ensure that the management of incidents, including the completion of thorough investigations, is undertaken in a timely manner. Review incident management documentation with NSW Health to ensure a balance is struck between timelines and practicality, whilst managing risks to public health appropriately. In doing so, ensure that the agreed timelines are met for the notification, reporting and investigation of recycled water incidents (Element 6).	**Completed**

Anticipated completion date

Not applicable – recommendation has been addressed.

Evidence sighted

Refer Appendix C (C.3.2).

Summary of findings/reasons for assessed status

Sydney Water demonstrated that this recommendation has been addressed.

The *Incident Debrief Procedure* and *Investigations Procedure* have both been reviewed and updated. NSW Health has reviewed both procedures and comments have been taken into consideration in the final versions.

Discussion and notes

The relevant incident management documentation was reviewed, and the *Incident Debrief Procedure*[568] and *Incident Investigation Procedure*[569] have been revised. Comments on these procedures were received from NSW Health and taken into consideration in developing the final versions.[570]

These procedures have both now been published on the Sydney Water Document Management System (SWIM).[571]

The *Incident Debrief Procedure* was used for the fluoride incident at Cascade WFP on 15 June 2024. The debrief was conducted on 5 July 2024, within the stipulated timelines as per the procedure, which states the requirement for debriefs and the required timing in section 3.1.

Further recommendations

There are no further recommendations arising in respect of this previous recommendation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this previous recommendation.

[568] SWIM 3060582 - Incident Debrief Procedure.docx.
[569] 3066049 Incident Investigation Procedure.
[570] Email: FW: Water Quality: Post incident Debriefs and Investigation.
[571] Email: FW: OL Audit Recommendation 2023-09 (Investigation Procedure)

3.2.2.8 Previous Recommendation 2023-12

Reference	Requirement	Status
2023-12	*Recycled Water (clause 4.2.3):* By 30 June 2024, move the St Marys Water Resource Recovery Facility (WRRF) filtration CCP turbidity meter to the outlet of the filters (replaces Rec 2022-07).	**Completed**

Anticipated completion date

Not applicable – recommendation has been addressed.

Evidence sighted

Refer Appendix C (C.3.2).

Summary of findings/reasons for assessed status

Sydney Water demonstrated that the turbidity meter for CCP 2 at the St Marys WRRF has been moved to the tertiary filter combined effluent. Accordingly, this previous recommendation is considered to have been addressed.

Discussion and notes

The filtration CCP turbidity meter at St Marys WRRF was moved to the outlet of the filter on 3 July 2024.[572] The change management form for the work was provided as evidence.[573]

Since the 2022/23 Operational Audit, a check has been undertaken on all sites, which identified that the same issue exists at two other sites (West Camden and Penrith). There is a task (RW150.0) in the 2024-25 Recycled Water Quality Improvement Plan[574] and waiting for the funding approval to install new turbidity meters on combined effluent at those plants. There was also an action (RW138.0) in the improvement plan to move the turbidity meter at Richmond WRRF; work was completed on 31 December 2023. This was due to a recommendation arising from the 2022 Operational Audit.

Further recommendations

There are no further recommendations arising in respect of this previous recommendation.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this previous recommendation.

[572] St Marys WRRF - CCP SCADA and Photos.pptx.
[573] St Marys WRRF – Change Management Form – CCP Turbidity meter.
[574] 2024-25 Recycled Water Quality Improvement Plan Q3 August 2024.xlsx.

3.2.3 Asset management (clause 5.5)

3.2.3.1 Previous Recommendation 2023-10

Reference	Requirement	Status
2023-10	*Asset management (clause 5.5.2):* By 31 December 2024, Sydney Water must take action to ensure that its maintenance management processes, including the management of associated records, are fully embedded (understood and implemented) across the organisation. This should be demonstrated by (for example): evidence that focused training of relevant personnel has been undertaken; and/or records of internal audits across a representative sample of facilities and maintenance groups.	**Completed**

Anticipated completion date

Not applicable – recommendation has been addressed.

Evidence sighted

Refer Appendix C (C.3.3).

Summary of findings/reasons for assessed status

Sydney Water demonstrated that, through the ongoing implementation of its Service Excellence improvement initiative, its maintenance management processes have been further developed. The responsibilities and objectives of the ROMP (Reliability Operations Maintenance and Process/Planning) teams have been clearly defined in the *ROMP Terms of Reference*, and maintenance and renewal processes have been reshaped through the Operational Service Planning Improvement project.

Importantly, there is evidence that Sydney Water has 'rolled out' these improvements across various levels of the organisation, principally through regular team meetings and focussed presentation sessions. Furthermore, through the implementation of a newly developed *Maintenance Assurance Procedure*, internal audits are being undertaken to assess whether asset management, including maintenance, processes are being fully and correctly implemented.

Process/practice improvements will continue to evolve and need to be embedded across the organisation as part of the continuous improvement process; however, for the purposes of this assessment, this previous recommendation is considered to have been addressed.

Discussion and notes

Sydney Water has addressed this recommendation through the ongoing implementation of its Service Excellence improvement initiative. Action taken in respect of maintenance management includes:

- The role of the ROMP groups has been developed and is being implemented;
- Arrangements for Operational Service Planning have been improved;
- An assurance procedure, aimed at ensuring that maintenance practices are properly implemented, has been developed and is being implemented; and

- Information sessions/training in respect of the various initiatives have been rolled out across relevant sections of the organisation.

The role of the ROMP (Reliability, Operations, Maintenance and Process) groups has been developed and is detailed in the *Terms of Reference; ROMP Construct*.[575] ROMP groups are aimed at facilitating collaboration between key stakeholders to ensure alignment of purpose to provide optimal, balanced and informed asset management decision making; in essence, they provide an overview role in respect of asset management field operations. The terms of reference clearly define the roles and responsibilities, membership, and operational logistics for each of the Treatment ROMP, Network Linear Assets ROMP and Network Facilities Mechanical Electrical ROM.

The Operational Service Planning Improvement Project has involved a review and reshaping of maintenance and renewal planning processes. A detailed process roadmap, which comprises some 32 process steps grouped into the following six phases has been developed:[576]

- Develop infrastructure strategies;
- Conduct reliability, Availability, Maintainability and Safety risked based infrastructure analysis;
- Develop a bottom-up investment plan (renewals and maintenance);
- Investment prioritisation;
- Determine integrated works plan for 24 months; and
- Determine work force and resource plan.

Process diagrams for each step identify the relevant inputs (including performance requirements, controls and constraints) and outputs. Data derived using the Asset Performance Tool (APT) (refer **section 2.3.4.1** in respect of sub-clause 5.5.2 for further discussion this initiative).

Sydney Water advised that it has developed a *Maintenance Assurance Procedure*[577] and increased the number of assurance audits being undertaken. Furthermore, it noted that a review of asset management system implementation is now being incorporated as part of drinking water and recycled water management systems audits.[578] As examples, Assurance Summary reports in respect of the following were provided:

- Assurance audit in respect of "Air Valve (asset # 8694593)/SP0797 Port Kembla Rising Main" to ensure that Regional Delivery Consortia "*Contractors are undertaking preventative maintenance activities as per Job Plan: Z-GEN017-V1*" – audit undertaken on 13 July 2023; no non-conformances identified, but improvement opportunities and observations recorded.[579]
- Assurance audit in respect of "SP0900- Sewage Pumping Station – Regentville" to provide "*Independent site validation of SW owned poles and any other assets that can fall and harm people*". The audit assessed whether poles and other assets that can potentially fall are correctly documented in Maximo with an effective maintenance strategy. Two major non-conformances were identified; a vent shaft was not recorded in Maximo (or Hydra) and there were no documented maintenance/inspection requirements for the vent shaft, and there were no documented maintenance/inspection requirements for a LV (low voltage) pole at the site.[580]

[575] Sydney Water, *Terms of Reference; ROMP Construct* (v2023), undated (file: *D0002291 ROMP Guideline.docx*).
[576] PowerPoint presentation*: Final Draft version_OSP_07May24.pptx*.
[577] Sydney Water, *Procedure; Maintenance Assurance Procedure* (Version 1), 4 September 2024 (file: *D0002385.docx*).
[578] Sydney Water response to 2024 Audit Questionnaire (file: *2023-24 OL Audit Questionnaire.docx*).
[579] Document: *AV8694593 – Audit.docx*.
[580] Document: *SP0900 - Audit 20240719.docx*.

- Assurance audits in respect of Orchard Hills and Warragamba Hub maintenance and renewal processes[581] and Macarthur Water Filtration Plant;[582] these are discussed in **section 2.3.4.1**.

As evidence that its maintenance management processes have been appropriately "rolled out" across the organisation, Sydney Water advised and provided invite/attendance records in respect of:[583]

- *AP Tool Training Sessions Summary* – AP (Asset Performance) Tool training sessions for ROMP Teams conducted across Water and Wastewater Treatment hubs (multiple sessions).[584]
- *D0002385- Maintenance Assurance Procedure* – communicated to ROMP team members. There has been a focus on utilising and testing the procedure with ROMP teams (i.e. training on the job).
- *Treatment Asset Management Awareness*[585] – a training module presented to the Reliability Engineer (RE) Team Meeting on the 25 July 2024 is an example of an asset management and maintenance management continuous improvement and awareness activity. Other examples are different APT (Asset Performance Tool) insight sessions, for example "Underperforming assets".
- *Operational Service Planning (OSP)* (which now being transitioned to the Maintenance and Renewal Value Chain):
  - High Level OSP model and process being shared, communicated and refined by Heads of Business (HoB).
  - OSP model and process being shared, communicated to all team members in the ETS Maintenance and renewals teams. Details of the OSP process were presented[586] to the teams on 4 July 2024 as part of the consultation process. Follow-up information was provided via email.[587]
  - OSP model and process being shared, communicated to all team members in the Facility Programs team within the Reliability and Maintenance improvement team (for example). Details of the OSP process were presented to the teams on 3 July 2024 as part of the consultation process.

On this basis, it is apparent that details of Sydney Water's maintenance management processes, and particularly improvements thereto, have continued to be rolled out across the organisation. Furthermore, assurance (audit) processes have been further developed and implemented to ensure compliance with required practices.

Improvements to Sydney Water's asset management practices will continue to be ongoing through both the Service Excellence program and other improvement initiatives; however, given that no material maintenance shortfalls have been identified during the conduct of this audit, the intent of this recommendation is considered to have been addressed.

Further recommendations

There are no further recommendations arising in respect of this previous recommendation.

[581] Document: *10 Orchard Hills and Warragamba WFP AM Audit Report 23_24.docx*.
[582] Document: *10 STD2490-00 Macarthur AM Audit Report 23-24.docx*.
[583] Email dated 10 October 2024 from Sydney Water to Cobbitty Consulting (re: *REC 2023-10 follow-up*).
[584] Document: *AP Tool Training Sessions Summary.docx*.
[585] PowerPoint presentation: *Asset Management Awareness Jul-24.pptx*.
[586] PowerPoint presentation*: Final Draft version_OSP_07May24.pptx*.
[587] Email (Sydney Water internal) dated 9 July 2024 (re: *Change Consultation for Rel & Operations Improvement and Operational Program teams*).

Opportunities for improvement

No opportunities for improvement have been identified in respect of this previous recommendation.

3.2.4 Memorandum of Understanding with FRNSW (clause 7.2)

3.2.4.1 Previous Recommendation 2023-11

Reference	Requirement	Status
2023-11	*Memorandum of Understanding with FRNSW (clause 7.2.2):* It is recommended that Sydney Water takes action to: (a) Complete hydraulic model rebuilds and provide hydrant pressure information to FRNSW for at least six supply zones, as indicated in the 2023 24 - Water Network Model Rebuild (BAU) & FRNSW Model Pressure/Flows program, by 30 June 2024. (b) Complete hydraulic model rebuilds and provide hydrant pressure information to FRNSW for at least another six supply zones by 30 June 2025. (c) Agree with FRNSW, a timeline for provision of the remaining pressure information to FRNSW by 30 June 2025 (or other date agreed by IPART).	 **Completed**

Anticipated completion date

Not applicable – recommendation has been addressed.

Evidence sighted

Refer Appendix C (C.3.4).

Summary of findings/reasons for assessed status

Sydney Water demonstrated that it has taken significant action in addressing this recommendation, with a first tranche of hydrant information delivered by 30 June 2024 and action taken (including budget approval) to obtain and engage additional modelling resources. The additional resources should ensure that the second tranche of information is delivered on time (i.e. by 30 June 2025). Furthermore, a timeline for delivery of the remaining hydrant information has been developed based on FRNSW nominated priorities and has been agreed to by FRNSW. On this basis, it is considered that parts (a) and (c) of the recommendation have been addressed.

It is noted that parts (b) and (c) of the recommendation have now been effectively superseded by the provisions of the *Sydney Water Operating Licence 2024-2028*. On that basis, and given the progress made to date, this recommendation is considered to have been addressed.

Discussion and notes

Sydney Water has made significant progress in addressing this recommendation, as follows:[588]

- Water Network Model Rebuild Project – Budget Approval:

  As noted at the time of the 2023 Operational Audit, Sydney Water had:

  - scoped the work required in order to update its portfolio of models to a state that will enable it to provide the information sought by FRNSW; and
  - submitted an internal seed funding request for development of a business case in support of the proposed hydraulic model upgrade program.

  Sydney Water advised that a Delivery Approval Business Case (DABC) for the Water Network Model Rebuild Project was approved in July 2024. It further advised that:

  > "*The DABC allows funding for the required specialist resources to rebuild all of the hydraulic models to meet both the first and second milestones in IPART's requirement (12 supply zones in total). The planning phase of the project has started and a project manager has now been assigned to the project. 2 additional modellers have been recruited and have been assigned 3 models each. A tender is being prepared to outsource 15 model rebuilds to accelerate the program. A recruitment process has also started to hire 7 additional modelling specialist resources for the project.*"

  This approval is a key step in enabling Sydney Water to fully address the recommendation.

- Water Network Model Rebuild Project – Initial Steps:

  Sydney Water advised that initial steps taken in implementing the Water Network Model Rebuild Project included the following:

  - A project manager has been assigned and delivery plan[589] developed.
  - Modellers are working on two (2) model rebuilds, with completion expected in December 2024.
  - Recruitment has commenced for an additional seven (7) project modellers, which will provide the capacity to work on an additional 70 models. It was noted that two (2) positions were under offer at the time of the audit interviews.
  - An internal request for approval to advertise a RFQ (Request for Quote) to engage external service providers to work on 15 models was being progressed at the time of the audit interviews. Approval has subsequently been granted.[590]

- Progress update:

  Sydney Water's *Fire Hydrant Handover Tracking Sheet*[591] indicates that a total of four (4) batches of hydrant data has been submitted to FRNSW to date. The data relates to some 89,900 hydrants, i.e. 29% of the approximately 310,000 hydrants total (an increase from 25% over the last 12 months). In terms of model rebuilds, this equates to approximately 21% of the required 110 models.

  Review of the most recent update of the Project Program[592] indicates that:

  - There has been some re-prioritisation of the model builds; and
  - Not all the six models identified in the *2023 24 - Water Network Model Rebuild (BAU) & FRNSW Model Pressure/Flows program* have yet been completed; two have been completed, two are in progress, and two are yet to be commenced. Nonetheless, significant progress towards the 30 June 2024 target has been made.

[588] Document (PowerPoint presentation): *Eng Mod-Water Network Model Rebuilds-IPART Audit Sep24.pdf.*
[589] Document: *1 Water Network Model Rebuild (Project) - 2024_28.pdf.*
[590] Documents: *Email 1-15 Model RFQ Purchase Request 19July24a.pdf*; and *Email 2-15 Model RFQ Purchase Request 19July24b.pdf.*
[591] MS Excel workbook: *1 Fire Hydrant Handover Tracking Sheet - May24 - V3.xlsx.*
[592] Document: *Water Network Model Rebuild (Project) - 2024_28 - 25Sep24c.pdf.*

The updated Project Program shows a further 21 model rebuilds per year are scheduled through to completion by 30 June 2028. Hydrant data is to be passed on the FRNSW as it becomes available.

- Liaison with FRNSW:

  Sydney Water continues to liaise with FRNSW, both informally and through the Fire Fighting Working Group (FFWG). Minutes of a FFWG meeting held on 7 August 2024[593] reveal that topics discussed included: "Model Rebuild Project Progress Update & Program Overview" and "Hydrant Pressure/Flow Data Handover Progress Update", amongst others.

  A further update on progress, including details of recruitment and model rebuild outsourcing (as outlined above) was provided to FRNSW on 26 September 2024.[594] This communication included the updates Project Program and FRNSW LGA Priority Listing[595] for review and confirmation; FRNSW subsequently confirmed that the current order of works meets FRNSW needs in terms of priority locations.[596]

It is noted that, in feedback provided to IPART in respect of the scope of this audit, FRNSW acknowledged progress in respect of the provision of information, noting (in part) that:

> "… *FRNSW consider that SWC has met its licence obligations in relation to compliance with an MOU with FRNSW.*
>
> *Specifically, SWC has provided pressure and flow performance data for a total 29% of hydrants within their network (approximately 90,000 hydrants). Through a collaborative working group, SWC has been liaising with FRNSW to develop information which has been presented to SWC Management. This information has highlighted the importance of completing network modelling. FRNSW understand that the decision to provide a budget to complete network modelling is imminent.*"

In summary:

- Sydney Water has made significant progress towards the 30 June 2024 target with a first tranche of information now delivered; however, it appears that the target of providing information for six supply zones was not achieved within that timeline (assuming that each model correlates to a single supply zone).
- The current Project Program indicates that Sydney Water will exceed the 30 June 2025 target, based on the number of model rebuilds scheduled for completion.
- The current Project Program, together with the prioritisation that underpins it, has been provided for review/confirmation and has been accepted by FRNSW, which indicates that a timeline for provision of the remaining pressure information has been agreed prior to 30 June 2025.

Notwithstanding the above assessment, it is noted that specific timing requirements for the provision of hydrant information have been embedded in the now current *Sydney Water Operating Licence 2024-2028*,[597] which came into effect on 1 July 2024. The requirements of parts (b) and (c) of the recommendation have therefore been effectively superseded; on that basis, this recommendation is considered to have been fully addressed.

Further recommendations

There are no further recommendations arising in respect of this previous recommendation.

[593] Document: *1 Minutes - FFWG_Meeting_7Aug24 - V2.docx.*
[594] Document: *Email-Model Rebuild Progress_Proj Plan Prior Confirmation–26Sep24.pdf.*
[595] MS Excel workbook: *LGA Details for FFWG Prior-16Nov22-FRNSW Priorities.xlsx.*
[596] Document: *email from FRNSW confirm delivery timeline 031024.msg.*
[597] IPART, *Sydney Water; Operating Licence 2024-2028*, undated.

Opportunities for improvement

No opportunities for improvement have been identified in respect of this previous recommendation.

Appendix A Audit Scope

The audit scope, as defined by IPART, is included in this Appendix.

2024 operational audit scope
Sydney Water Corporation

This document sets out the 2024 operational audit scope for Sydney Water Corporation (Sydney Water).

We undertake annual audits of Sydney Water's compliance with its operating licence 2019-2024 (licence). We report to the Minister for Water on Sydney Water's compliance and the annual audits inform this report.

We have engaged Cobbitty Consulting Pty Ltd (auditor) to partner with us in delivering the 2024 audit.

Compliance period

The compliance period for the 2024 audit is from 1 July 2023 to 30 June 2024.

Audit scope

Licence clauses to be audited

Table 1 sets out the licence clauses that are included in the 2024 audit scope and identifies which clauses the auditor has checked versus those that we (IPART) have checked.

We do not audit Sydney Water's compliance with all licence clauses annually. We adopt a risk-based audit approach to deciding which licence clauses should be included in the annual audit scopes. This means that we audit 'high risk' clauses more frequently and 'low risk' clauses less frequently but aim to audit all auditable licence clauses at least once over the term of the licence.

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.

Auditing ongoing recommendations from previous audits

Table 2 sets out ongoing audit recommendations from previous audits for Sydney Water to rectify non-compliances. The auditor must review these recommendations to assess Sydney Water's progress in completing them by their due dates.

Input from government agencies

We consult with government agencies that Sydney Water has regulated relationships with under the licence to inform the audit scope. For the 2024 audit, we have received feedback from the Department of Climate Change, Energy, the Environment and Water (DCCEEW), the NSW Environment Protection Authority (EPA), Fire and Rescue NSW (FRNSW) and NSW Health about Sydney Water's performance during the compliance period.

Input from Sydney Water's statement of compliance

Sydney Water provides a Statement of Compliance (SC) by 1 September each year. The 2024 SC has informed the audit scope.

The SC is an exception-based report that outlines any non-compliances with the licence during the previous financial year that Sydney Water has self-identified. The financial year is different to the compliance period. The SC also identifies what remedial action Sydney Water has taken to rectify these non-compliances.

The audit process

We conduct audits in accordance with the Public Water Utility Audit Guideline. The 2024 audit process involves:

- receiving and reviewing reports
- undertaking and attending audit interviews with Sydney Water staff
- undertaking field verification to investigate how effectively the requirements of the licence are met in practice.

Table 3 lists the locations that we visited in previous audits that have informed how we have selected sites for visiting in 2024. We select these sites together with the auditor, incorporating feedback from NSW Health. We then liaise with Sydney Water before the field verification visits are scheduled to commence to consider any practical limitations.

Interpreting the audit scope in Table 1

We explain below how to use and interpret the audit scope in Table 1.

Key for interpreting the audit scope in Table 1

Requirement	Meaning
Audit/Internal IPART check	Audit/ check clause in 2024 audit
SC	This clause is not included in the 2024 audit scope. Sydney Water is still required to report any non-compliances against this clause in its Statement of Compliance. This information has input into the final 2024 audit scope.
NR	No requirement for audit.

Guidance for the auditor

Auditors should note any directions in the 'guidance for the auditor' column of Table 1. This guidance explains when a licence clause is not auditable, Sydney Water's historical compliance with previously audited licence clauses and inputs from other stakeholders.

Interpretation

In the case of any discrepancies between the licence and the audit scope in Table 1, the licence will prevail.

Table 1 2024 Audit scope for Sydney Water Corporation

Licence clause	Operating Licence obligation	2024 audit requirement	Comments for the auditor
1	**Licence and licence authorisation**		
1.1	**Objectives of this licence**		
1.1.1	The objectives of this Licence are to: a. authorise and require Sydney Water, within its Area of Operations, to: i. store or supply water ii. provide sewerage services iii. provide Stormwater Drainage Systems; and iv. dispose of Wastewater; and b. set efficient and effective terms and conditions, including quality and performance standards, that require Sydney Water to provide services in a way that: i. supports its principal objectives under the Act to protect public health and the environment; ii. supports its principal objective under the Act to be a successful business, including by having regard to the interest of the community; and iii. does not prevent or hinder competition.	NR	Information clause – does not require audit.
1.2	**Area of operations**		
1.2.1	This Licence applies to the Area of Operations specified in Schedule A.	NR	Information clause – does not require audit.
1.2.2	Sydney Water must publish on its website a map of its Area of Operations by 31 December 2019 (or another date approved by IPART in writing). Sydney Water must update the map within 30 days of any change to its Area of Operations.	SC	
1.3	**Term of this licence**		
1.3.1	The term of this Licence is four years from the Commencement Date. *[Note: On and from the Commencement Date, this Licence replaces any previous version of the operating licence granted to Sydney Water under section 12 of the Act.]*	NR	Information clause – does not require audit.
1.4	**Licence amendment**		
1.4.1	Subject to the Act and clause 1.4.2, the Governor may amend or substitute this Licence by notice in the New South Wales Government Gazette.	NR	Information clause – does not require audit.

1.4.2	Before notice of a proposed amendment to this Licence is tabled in Parliament under section 16 of the Act, the Minister must provide Sydney Water with reasonable notice of the proposed amendment to enable it to comply with the amendment if it takes effect. *[Note: The Customer Contract may be varied in accordance with section 59 of the Act and clause 14.2 of the Customer Contract. Such a variation is not an amendment to this Licence for the purpose of section 16 of the Act.]*	NR	Information clause – does not require audit.
1.5	**Non-exclusive licence**		
1.5.1	This Licence does not prohibit any other 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.
1.6	**Availability of licence**		
1.6.1	Sydney Water must make a copy of this Licence available to any person, free of charge: a. on its website; and b. upon request made to the Contact Centre.	SC	
1.7	**Pricing**		
1.7.1	Sydney Water must set the level of fees, charges, and other amounts payable for its Services in accordance with: a. the terms of the Licence; b. the Act; and c. any applicable maximum prices or methodologies for fixing maximum prices determined under the IPART Act.	SC	
1.8	**End of Term Review**		
1.8.1	IPART intends to review this Licence in its final year to investigate: a. whether this Licence is fulfilling its objectives; and b. any issues that have arisen during the term of this Licence that may impact its effectiveness, (the End of Term Review).	NR	Information clause – does not require audit.
1.8.2	To assist IPART with the End of Term Review, Sydney Water must provide IPART with such information as IPART reasonably requires. Sydney Water must provide IPART with such information as IPART requests within a reasonable time.	Internal IPART check	This clause is not included in the auditor's scope.
1.9	**Notices**		
1.9.1	Any notice or other communication given under this Licence must be: a. in writing addressed to the intended recipient; and b. delivered or sent to one of the addresses specified below (or the last address notified by the recipient), unless otherwise specified in the Reporting Manual. **Sydney Water**: Sydney Water, The Managing Director, Sydney Water, 1 Smith Street, Parramatta NSW 2150 **Minister**: The Hon. Melinda Pavey MP, GPO Box 5341, Sydney NSW 2001 **IPART**: 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.
1.9.2	Any requests for approval under the following clauses must be made by Sydney Water's Managing Director: 1.2.2, 3.1.7, 3.2.1, 3.2.6, 6.5.1, 6.6.6, 8.2.2, 8.2.3, 8.2.5, 8.2.6, 9.1.1, 8 or 9.3.1.	NR	Information clause – does not require audit.

2.1	**Licence authorisations**		
2.1.1	This Licence authorises and requires Sydney Water to provide, construct, operate, manage and maintain efficient, co-ordinated and commercially viable systems and services for providing the following Services within the Area of Operations: a. storing and supplying water; b. providing sewerage services; and c. disposing of Wastewater.	NR	Licence authorisation clause – does not require audit.
2.1.2	This Licence authorises and requires Sydney Water to provide, operate, manage and maintain a Stormwater Drainage System as described in section 14(1)(b) of the Act, except to the extent that the Minister is satisfied under sections 14(4) and 14(5) of the Act that satisfactory arrangements have been made for the applicable Service to be provided by another appropriate body.	NR	Licence authorisation clause– does not require audit.
2.1.3	This Licence authorises (but does not require) Sydney Water to provide, construct, operate, manage and maintain efficient, co-ordinated and commercially viable Stormwater Drainage Systems (and Services for providing those Stormwater Drainage Systems) within the Area of Operations in excess of the Stormwater Drainage System it is required to provide, operate, manage and maintain under clause 2.1.2. This includes increasing the capacity of the Stormwater Drainage System included in the business undertaking transferred under Part 3 of the Act from the Water Board to Sydney Water as at the date of the transfer of the business undertaking. *[Note: For the avoidance of doubt, the provision, management and maintenance of Stormwater Drainage Systems (and Services for providing those Stormwater Drainage Systems) under clause 2.1 may include stormwater quality management and other measures as necessary to manage impacts of stormwater on waterway health.]*	NR	Licence authorisation clause – does not require audit.
2.2	**Obligation to make services available**		
2.2.1	Sydney Water must ensure that Services for the supply of Drinking Water and disposal of Wastewater are available on request for connection to any Property situated in the Area of Operations for which a connection is available.	SC	
2.2.2	Sydney Water must provide Services for the supply of Drinking Water and disposal of Wastewater on request to any licensee under the WIC Act, where that licensee is connected to (or where a connection is available in respect of that licensee to) Sydney Water's water supply system or sewerage system.	SC	
2.2.3	Connection to Sydney Water's systems for the provision of Services for the supply of Drinking Water and disposal of Wastewater is subject to any reasonable conditions that Sydney Water may determine to ensure the safe, reliable and financially viable supply of Drinking Water and disposal of Wastewater to Properties.	NR	Licence authorisation clause – does not require audit.
3.1	**Economic approach for water conservation**		
3.1.1	Sydney Water must maintain a water conservation program consistent with the Current Economic Method.	SC	
3.1.2	Sydney Water must implement water conservation measures that have been assessed as economic as determined by the Current Economic Method.	SC	
3.1.3	Sydney Water must make: a. a copy of the Current Economic Method; b. a plain English summary of the Current Economic Method; and	SC	

	c. the economic level of water conservation (expressed as the value of water in dollars per kilolitre and as the quantity of savings in megalitres per day) determined in accordance with the Current Economic Method, available: d. to any person, free of charge upon request made to the Contact Centre; and e. on Sydney Water's website.		
3.1.4	Sydney Water must update the economic level of water conservation using the Current Economic Method: a. for the purposes of clause 3.1.1 and 3.1.2—annually; and b. or the purposes of clause 3.1.3(c)—monthly.	SC	
3.1.5	The Minister may, at any time during the term of this Licence and in writing, direct Sydney Water to revise the Current Economic Method in any way the Minister requires. *[Note: The Minister may request IPART to undertake a review of the Current Economic Method during the term of this Licence. Such review may precede a direction given under clause 3.1.5.]*	NR	Information clause – does not require audit but auditor should note this when auditing clause 3.1.6
3.1.6	Sydney Water must submit to the Minister the Current Economic Method revised in accordance with the written direction within: a. 30 days of receipt of that direction; or b. any other timeframe agreed by the Minister.	SC	Audit if triggered by a Ministerial direction under clause 3.1.5. **IPART** has sought confirmation from DCCEEW to confirm if the Minister made any directions to Sydney Water during the compliance period and has sought comment on Sydney Water's performance against this clause. DCCEEW has made no comments in response. We understand that the Minister did not make any directions during the compliance period.
3.1.7	If the Minister approves the revised Current Economic Method, he or she will give written notice of the approval to Sydney Water.	NR	Information clause – does not require audit but auditor should note this when auditing clause 3.1.6
3.2	**Water Planning**		
3.2.1	By 1 December 2020 (or another date approved by the Minister in writing), Sydney Water must develop, and submit to the Minister: a. a long-term capital and operational plan; and b. an emergency drought response plan.	NR	
3.2.2	The plans referred to in clause 3.2.1 must address any written guidance that the Minister provides to Sydney Water	NR	Information clause – does not require audit.
3.2.3	Sydney Water must use its best endeavours to develop the plans referred to in clause 3.2.1 in cooperation with Water NSW.	NR	Information clause – does not require audit.
3.2.4	Sydney Water must implement any action that: a. Sydney Water is responsible for delivering under the Metropolitan Water Plan; or b. the Minister directs, in writing, Sydney Water to implement.	NR	The Metropolitan Water Plan has been superseded by the Greater Sydney Water Strategy and this clause no longer applies.

			IPART has sought confirmation from DCCEEW if the Minister made any directions to Sydney Water to undertake actions under the Greater Sydney Water Strategy (which has replaced the MWP) during the compliance period and has sought comment on Sydney Water's performance against this clause. DCCEEW has made no comments in response. We understand that the Minister did not make any directions during the compliance period.
3.2.5	Sydney Water must participate cooperatively in any review of the Metropolitan Water Plan.	NR	The Metropolitan Water Plan has been superseded by the Greater Sydney Water Strategy and this clause no longer applies.
3.2.6	Sydney Water must develop and enter into a data sharing agreement with DPE by the Commencement Date (or another date approved by the Minister in writing) to assist in the development and review of the Metropolitan Water Plan (the Data Sharing Agreement)	NR	
3.2.7	In addition to any other matters agreed by Sydney Water and DPE, the Data Sharing Agreement must: a. set out the roles and responsibilities of Sydney Water and DPE under the Data Sharing Agreement; b. set out the types of data that are covered by the Data Sharing Agreement; c. set out the purposes for the sharing of data and information; d. set out the requirements that shared data and information must meet; e. identify agreed timelines and the format for sharing data and information; and f. identify procedures for resolving matters of conflict in providing data and information.	SC	
3.2.8	Once Sydney Water has entered into the Data Sharing Agreement it must comply with the Data Sharing Agreement.	SC	
3.2.9	Sydney Water must provide any data or information requested by the Minister in writing: a. by the date specified by the Minister; and b. to the Minister or, if the Minister so directs, to DPE.	SC	Audit if triggered by a Ministerial request in writing **IPART** has sought confirmation from DCCEEW to confirm if the Minister sent any requests to Sydney Water during the compliance period and has sought comment on Sydney Water's performance against this clause. DCCEEW has replaced the previous DPE. DCCEEW has made no comments in response. We understand that the Minister did not make any directions during the compliance period.

3.3	**Priority Sewerage Program**		
3.3.1	Sydney Water must participate cooperatively in any NSW Government review of the Priority Sewerage Program.	SC	Audit if triggered by a NSW Government review of the Priority Sewerage Program.
3.3.2	If required by the Minister, Sydney Water must implement and comply with any outcomes (including timeframes) of any NSW Government review of the Priority Sewerage Program. *[Note: The areas to which the Priority Sewerage Program applies are Austral, Menangle, Menangle Park, Nattai, Scotland Island and Yanderra as listed in Schedule B of this Licence.]*	SC	Audit if triggered by a Ministerial direction in writing. Audit together with clause 3.3.1. **IPART** has sought confirmation from DCCEEW to confirm if the Minister sent any directions to Sydney Water during the compliance period and has sought comment on Sydney Water's performance against this clause. DCCEEW has made no comments in response. We understand that the Minister did not make any directions during the compliance period.
4.1	**Drinking Water**		
4.1.1	Sydney Water must maintain a Management System that is consistent with the Australian Drinking Water Guidelines and any requirements relating to Drinking Water specified by NSW Health (the Drinking Water Quality Management System)	SC	**IPART** has sought comments from NSW Health on Sydney Water's performance against this clause. NSW Health's comments are summarised under clause 4.1.3 below.
4.1.2	In the event of inconsistency between the requirements specified by NSW Health referred to in clause 4.1.1 and the Australian Drinking Water Guidelines, the requirements specified by NSW Health prevail.	NR	Information clause – does not require audit but auditor should note this when auditing clause 4.1.1.
4.1.3	Sydney 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. *[Note: Sydney Water is to apply the Drinking Water Quality Management System to the Drinking Water system under its control, having regard to the entire Drinking Water supply system – from the water catchment to the Consumer.]*	Audit	**Auditor** to check implementation of all elements of Sydney Water's drinking water quality management system. We last audited this clause in 2023 and assigned a Compliant (Minor shortcomings) grade. **Auditor** to check Sydney Water's progress with completing recommendations 2023-01, 2023-02 and 2022-03 by their due dates (see Table 3). **IPART** has sought comments from NSW Health on Sydney Water's performance against this clause. NSW Health has:

			• provided feedback on performance • recommended the **auditor** consider Sydney Water's progress on consistency of controls for critical processes across plants and prioritising and addressing outstanding issues with assets • suggested sites to visit.
4.2	**Recycled Water**		
4.2.1	Sydney Water must maintain a Management System that is consistent with the Australian Guidelines for Water Recycling and any requirements relating to water recycling specified by NSW Health (the Recycled Water Quality Management System).	SC	**Auditor** to check Sydney Water's progress with completing Recommendation 2023-03 by its due date (see Table 3). **IPART** has sought comments from NSW Health on Sydney Water's performance against this clause. NSW Health's comments are summarised under clause 4.2.3 below.
4.2.2	In the event of inconsistency between the requirements specified by NSW Health referred to in clause 4.2.1 and the Australian Guidelines for Water Recycling, the requirements specified by NSW Health prevail.	NR	Information clause – does not require audit but auditor should note this when auditing clause 4.2.1.
4.2.3	Sydney 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	**Auditor** to check implementation of all elements of Sydney Water's recycled water quality management system. We last audited this clause in 2023 and assigned a Non-compliant (non-material) grade. **Auditor** to check Sydney Water's progress with completing the following recommendations by their due dates (see Table 3): • 2023-04 • 2023-05 • 2023-06 • 2023-07 • 2023-08 • 2023-09 • 2023-12 **IPART** has sought comments from NSW Health on Sydney Water's performance against this clause. NSW Health has: • provided feedback on performance

			• recommended the **auditor** consider Sydney Water's progress on consistency of controls for critical processes across plants and prioritising and addressing outstanding issues with assets • suggested sites to visit.
4.3	**Fluoridation Code**		
4.3.1	Sydney Water must comply with the Fluoridation Code and any requirements for fluoridation specified by NSW Health.	Audit	We last audited this clause in 2021 and assigned a Compliant grade. **IPART** has sought comments from NSW Health on Sydney Water's performance against this clause. NSW Health has: • provided feedback on performance • recommended the **auditor** consider Sydney Water's progress on consistency of controls for critical processes across plants and prioritising and addressing outstanding issues with assets • suggested sites to visit.
4.3.2	In the event of inconsistency between the requirements specified by NSW Health referred to in clause 4.3.1 and the Fluoridation Code, the requirements specified by NSW Health prevail.	NR	Information clause – does not require audit but auditor should note this when auditing clause 4.3.1.
5.1	**Water Continuity Standard**		
5.1.1	Sydney Water must ensure that, in each financial year, at least 9,800 Properties per 10,000 Properties (in respect of which Sydney Water provides a Drinking Water supply service) receive a Drinking Water supply service unaffected by an Unplanned Water Interruption (the Water Continuity Standard).	Audit	We last audited this clause in 2021 and assigned a Compliant grade.
5.1.2	Sydney Water must use: a. the Water Continuity Optimal Level; and b. the Water Continuity Tolerance Band, as inputs to decisions regarding the design, construction, operation and maintenance of its water supply system.	SC	
5.1.3	For the purposes of clause 5.1.2: a. the Water Continuity Optimal Level is 9,840 Properties per 10,000 Properties (in respect of which Sydney Water provides a Drinking Water supply service) in each financial year receiving a Drinking Water supply service unaffected by an Unplanned Water Interruption; and b. the Water Continuity Tolerance Band is the band of deviations from the Water Continuity Optimal Level between: i. the mandatory Water Continuity Standard (specified in clause 5.1.1 above); and	NR	Information clause – does not require audit but auditor should note this when auditing clause 5.1.2.

	ii. an upper bound of 9,880 Properties per 10,000 Properties (in respect of which Sydney Water provides a Drinking Water supply service) in each financial year receiving a Drinking Water supply service unaffected by an Unplanned Water Interruption. *[Note: Clause 5.1.2 requires Sydney Water to use the Water Continuity Optimum Level and Water Continuity Tolerance Band as inputs into certain decisions. If Sydney Water complies with clause 5.1.2, it will be compliant with this clause 5.1 even if the number of Properties unaffected by an Unplanned Water Interruption exceeds the upper bound of the Water Continuity Tolerance Band. However, IPART may consider the prudency and efficiency of any expenditure related to this level of performance at the next review of Sydney Water's prices.]*		
5.1.4	Sydney Water must use the best available data (taking account of water pressure data, where available) to determine whether a Property has experienced an Unplanned Water Interruption.	Audit	We last audited this clause in 2021 and assigned a Compliant grade.
5.1.5	If a Property experiences an Unplanned Water Interruption that was caused by a Third Party or a power failure, the Property is taken not to have experienced an Unplanned Water Interruption for the purposes of this clause 5.	NR	Information clause – does not require audit but auditor should note this when auditing clause 5.1.
5.1.6	For the purpose of the Water Continuity Standard, Water Continuity Optimal Level and Water Continuity Tolerance Band: a. each separately billed part of a Multiple Occupancy Property is to be counted as a separate Property; and *[Note: For example, a complex of five townhouses where each townhouse receives a separate Bill from Sydney Water is to be counted as five separate Properties. However, a block of five flats that only receives one Bill from Sydney Water is to be counted as a single Property.]* b. each separate instance, in a financial year, of a single Property experiencing an Unplanned Water Interruption is to be counted as a separate Property that has experienced an Unplanned Water Interruption.	NR	Information clause – does not require audit but auditor should note this when auditing clause 5.1.
5.2	**Water Pressure Standard**		
5.2.1	Sydney Water must ensure that, in each financial year, at least 9,999 Properties per 10,000 Properties (in respect of which Sydney Water provides a Drinking Water supply service) receive a Drinking Water supply service affected by fewer than 12 Water Pressure Failures (the Water Pressure Standard).	Audit	We last audited this clause in 2020 and assigned a Compliant grade.
5.2.2	A Property is taken to have experienced a Water Pressure Failure when: a. a person notifies Sydney Water that the Property has experienced a Water Pressure Failure and Sydney Water confirms that the Property has experienced a Water Pressure Failure; or b. Sydney Water identifies that the Property has experienced a Water Pressure Failure (including through its data collection systems and hydraulic analysis).	NR	Information clause – does not require audit but auditor should note this when auditing clause 5.2.
5.2.3	A Property will not be taken to have experienced a Water Pressure Failure if that Water Pressure Failure occurred only because of: a. water usage in the case of a fire or other abnormal demand; or	NR	Information clause – does not require audit but auditor should note this when auditing clause 5.2.

	b. a short term or temporary operational problem (such as a main break), including where caused by a Third Party, that is remedied within four days of its commencement.		
5.2.4	For the purpose of the Water Pressure Standard: a. where a Property experiences multiple Water Pressure Failures in a day, only one of those Water Pressure Failures is to count as a Water Pressure Failure experienced by that Property; b. where a Property experiences a Water Pressure Failure that affects more than one day, each day affected is to be counted as a separate Water Pressure Failure; c. each separately billed part of a Multiple Occupancy Property is to be counted as a separate Property; *[Note: For example, a complex of five townhouses where each townhouse receives a separate Bill from Sydney Water is to be counted as five separate Properties. However a block of five flats that only receives one Bill from Sydney Water is to be counted as a single Property.]* d. each Property that is affected by 12 or more Water Pressure Failures in a financial year is to be counted once only as a Property that has been affected by 12 or more Water Pressure Failures in that financial year; and e. after 30 June 2020, where a Property in, or in the vicinity of, a Property Cluster, is connected for the first time to Sydney Water's Drinking Water supply system and Sydney Water has informed the owner (at the time of connection) of: i. the risk of recurring Water Pressure Failures should the Property be connected to that system; and ii. options to reduce that risk; that Property is not to be counted for the purposes of the Water Pressure Standard.	NR	Information clause – does not require audit but auditor should note this when auditing clause 5.2.
5.2.5	For each Property Cluster, Sydney Water must: a. by 30 June 2020, review its business processes to ensure that no Property at risk of being affected by recurring Water Pressure Failures from the same cause is connected to Sydney Water's Drinking Water supply system, unless the owner (at the time of connection) is: i. informed of that risk; and ii. provided with options to reduce that risk; and b. by 31 October 2022, take steps to minimise or eliminate the risk of recurring Water Pressure Failures from that cause, in a manner that takes into account its Customers' willingness to pay for Drinking Water supply services.	NR	Fixed deadline requirement (only required to be audited in year of deadline) – completed.
5.3	**Dry Weather Wastewater Overflow Standard**		
5.3.1	Sydney Water must ensure that, in each financial year, at least: a. 9,928 Properties per 10,000 Properties (in respect of which Sydney Water provides a sewerage service but excluding Public Properties) receive a sewerage service unaffected by an Uncontrolled Wastewater Overflow; and b. 9,999 Properties per 10,000 Properties (in respect of which Sydney Water provides a sewerage service but excluding Public Properties) receive a sewerage service affected by fewer than three Uncontrolled Wastewater Overflows,	Audit	We last audited this clause in 2021 and assigned a Compliant grade. **IPART** has sought comments from the EPA on Sydney Water's performance against this clause.

	(the Dry Weather Wastewater Overflow Standard).		EPA provided feedback on Sydney Water's performance against its environmental protection licences as context for auditing this licence clause.
5.3.2	A Property is taken to have experienced an Uncontrolled Wastewater Overflow when: a. a person notifies Sydney Water that a Property has experienced a sewage overflow, where Sydney Water later confirms that the sewage overflow is an Uncontrolled Wastewater Overflow; or b. Sydney Water's systems identify that a Property has experienced an Uncontrolled Wastewater Overflow.	NR	Information clause – does not require audit but auditor should note this when auditing clause 5.3.
5.3.3	For the purpose of the Dry Weather Wastewater Overflow Standard: a. each Multiple Occupancy Property is to be counted as a single Property; [Note: For example, a complex of five townhouses where each townhouse receives a separate Bill from Sydney Water is to be counted as a single Property.] b. for the purpose of clause 5.3.1(a), each separate instance, in a financial year, of a single Property experiencing an Uncontrolled Wastewater Overflow is to be counted as a separate Property that has experienced, in that financial year, an Uncontrolled Wastewater Overflow; and c. for the purpose of clause 5.3.1(b), each Property that experiences three or more Uncontrolled Wastewater Overflows in a financial year is to be counted once only as a Property that has experienced three or more Uncontrolled Wastewater Overflows in that financial year.	NR	Information clause – does not require audit but auditor should note this when auditing clause 5.3.
5.4	**Interpretation of standards**		
5.4.1	In the case of any ambiguity in the interpretation or application of the Water Continuity Standard, the Water Pressure Standard, the Dry Weather Wastewater Overflow Standard or clause 5.2.5, IPART's interpretation or assessment of the standard or clause will prevail.	NR	Information clause – does not require audit but auditor should note this when auditing clauses 5.1, 5.2 and 5.3.
5.5	**Asset Management**		
5.5.1	Sydney Water must maintain a Management System in relation to Sydney Water's Assets that is consistent with the Australian Standard AS ISO 55001:2014 Asset management – Management systems – Requirements (the Asset Management System).	SC	
5.5.2	Sydney Water must ensure that the Asset Management System is fully implemented and that all relevant activities are carried out in accordance with the Asset Management System.	Audit	We last audited this clause in 2023 and assigned a Non-Compliant (Non-material) grade. **Auditor** to check Sydney Water's progress with completing Recommendation 2023-10 by its due date (see Table 3)
6.1	**Customer contract**		
6.1.1	The Customer Contract sets out the rights and obligations of Customers and Sydney Water in relation to the Services provided in accordance with this Licence. The Customer Contract is set out in Schedule C of this Licence.	NR	Information clause – does not require audit.

6.1.2	Sydney Water must make a copy of the Customer Contract available to any person, free of charge: a. on its website; and b. upon request made to the Contact Centre.	SC	
6.2	**Providing information to Customers**		
6.2.1	Sydney Water must prepare one or more communications that: a. provide a brief explanation of the Customer Contract; b. summarise the key rights and obligations of Customers under the Customer Contract; c. refer to the types of account relief available for Customers experiencing financial hardship; d. outline the rights of Customers to claim a rebate and the conditions that apply to those rights; e. contain information regarding how to contact Sydney Water by telephone, email or post; and f. contain information regarding the ability of a Customer to enter into agreements with Sydney Water separate to the Customer Contract for the provision of Services by Sydney Water to the Customer.	SC	
6.2.2	Sydney Water must update the communication or communications to reflect any variations made to the Customer Contract.	SC	
6.2.3	Sydney Water must: a. provide the communication or communications and any updates, free of charge to: i. Customers at least annually with their Bills; and ii. any person upon request made to the Contact Centre; and b. make the communication or communications and any updates publicly available on its website, free of charge, within 60 days of the commencement of the Customer Contract or any communication update.	SC	
6.2.4	Sydney Water must publish on its website and advertise at least annually in a manner that Sydney Water is satisfied is likely to come to the attention of members of the public, information as to: a. the types of account relief available for Customers experiencing payment difficulty; and b. rights of Customers to claim rebates and the conditions that apply to those rights.	SC	
6.3	**Consumers**		
6.3.1	Sydney Water's obligations under the following clauses of the Customer Contract are extended to Consumers as though the Consumers were parties to the Customer Contract: a. clause 5.1 (Payment difficulties and assistance options for all customers); b. clause 6.5 (Occupiers (tenants) may pay charges to avoid restriction or disconnection); c. clause 12 (If I am unhappy with the service provided by Sydney Water what can I do?); d. clause 13 (Consultation, information and privacy); and e. clause 14 (When does this contract with Sydney Water terminate?).	NR	Information clause – does not require audit.
6.4	**Assistance Options for Payment Difficulties and Actions for Non-Payment**		
6.4.1	Sydney Water must maintain and fully implement:	SC	

	a. a payment difficulty policy that assists residential Customers experiencing payment difficulty to better manage their current and future Bills; b. procedures relating to a payment plan for residential Customers who are responsible for paying their Bills and who are, in Sydney Water's reasonable opinion, experiencing payment difficulty; c. procedures for identifying the circumstances under which Sydney Water may disconnect or restrict the supply of water to a Customer's Property; and d. provisions for self-identification, identification by community welfare organisations and identification by Sydney Water of residential Customers experiencing payment difficulty, (the Assistance Options for Payment Difficulties and Actions for Non-Payment).	
6.4.2	Sydney Water must provide, free of charge, an explanation of the Assistance Options for Payment Difficulties and Actions for Non-Payment on its website and to: a. all residential Customers, at least annually with their Bills; b. residential Customers who Sydney Water identifies as experiencing payment difficulty on the date that Sydney Water first identifies that the Customer is experiencing payment difficulty; and c. any other person upon request made to the Contact Centre.	SC
6.5	**Family Violence**	
6.5.1	Sydney Water must develop and implement a family violence policy by 1 July 2020 (or another date approved by IPART in writing).	SC
6.5.2	The family violence policy must, at a minimum, provide for: a. the protection of private and confidential information; b. access to payment difficulty programs; c. processes that minimise the reliance on individuals to disclose their family violence; and d. processes for referrals to specialist services.	SC
6.6	**Customer engagement**	
6.6.1	Sydney Water must undertake customer engagement to understand its customers' preferences and willingness to pay for service levels. The customer engagement must be relevant, representative, proportionate, objective, clearly communicated and accurate.	SC
6.6.2	Sydney Water must establish and regularly consult with its Customer Council.	SC
6.6.3	Sydney Water must provide the Customer Council with information in Sydney Water's possession or under its custody or control necessary to enable the Customer Council to discharge the tasks assigned to it, other than information or documents that are confidential or privileged.	SC
6.6.4	Sydney Water must keep minutes of proceedings of the Customer Council and make a copy of the minutes available to any person, free of charge, upon request made to the Contact Centre.	SC

6.6.5	Sydney Water must undertake a review of the operation of the Customer Council. The review must include an assessment of the Customer Council's role, objectives, outcomes and membership, including whether the Customer Council could be used to better support customer engagement, as required by clause 6.6.1.	SC	
6.6.6	Sydney Water must report to IPART on the completed review and its outcomes by 30 June 2020 (or another date approved by IPART in writing).	NR	Fixed deadline requirement. Completed.
6.7	**Internal complaints handling**		
6.7.1	Sydney Water must maintain a procedure for receiving, responding to and resolving Complaints. The procedure must be consistent with Australian Standard AS/NZS 10002:2014 – Guidelines for complaint management in organizations (the Internal Complaints Handling Procedure).	SC	
6.7.2	Sydney 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	SC	
6.7.3	Sydney Water must provide to Customers, at least annually with their Bills, information concerning internal Complaints handling. The information must explain how to make a Complaint and how Sydney Water will receive, respond to and resolve Complaints.	SC	
6.7.4	Sydney Water must make the information concerning internal Complaints handling referred to in clause 6.7.3 available to any person, free of charge: a. on its website; and b. upon request made to the Contact Centre.	SC	
6.8	**External dispute resolution scheme**		
6.8.1	Sydney Water must be a member of the Energy & Water Ombudsman NSW to facilitate the resolution of disputes between Sydney Water and its Customers and Consumers.	SC	
6.8.2	Sydney Water must: a. prepare a communication that: i. lists the dispute resolution services provided by the Energy & Water Ombudsman NSW, including any right to have a Complaint or dispute referred to the Energy & Water Ombudsman NSW; and ii. explains how a Consumer can contact the Energy & Water Ombudsman NSW; b. provide a copy of that communication, free of charge to Customers at least once a year with their Bills; and c. make a copy of that communication available to any person, free of charge: i. on its website; and ii. upon request made to the Contact Centre.	SC	
7.1	**Memoranda of Understanding with WAMC, NSW Health and EPA**		
7.1.1	Sydney Water must maintain the memoranda of understanding entered into under section 35 of the Act with: a. the Water Administration Ministerial Corporation (WAMC); b. the Secretary of the Ministry of Health (NSW Health); and c. the Environment Protection Authority (EPA).	SC	**IPART** has sought comments from DCCEEW (on behalf of WAMC), NSW Health and the EPA on Sydney Water's performance against this clause.

			DCCEEW made no comments in response. NSW Health and the EPA reported that Sydney Water has performed effectively under this licence clause.
7.1.2	The purpose of the memoranda of understanding referred to in clause 7.1.1 is to form the basis for cooperative relationships between the parties. In particular: a. the purpose of the memorandum of understanding with WAMC is to recognise the role of WAMC in regulating water access, use and management and Sydney Water's right to use water vested in WAMC; b. the purpose of the memorandum of understanding with NSW Health 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 which is safe to drink; and c. the purpose of the memorandum of understanding with EPA is to recognise the role of EPA as the environment regulator of New South Wales and to commit Sydney Water to environmental obligations.	NR	Information clause – does not require audit.
7.2	**Memorandum of Understanding with FRNSW**		
7.2.1	Sydney Water must use its best endeavours to maintain a memorandum of understanding with Fire and Rescue NSW (FRNSW).	SC	**IPART** has sought comments from FRNSW on Sydney Water's performance against this clause. FRNSW has noted improvements in this compliance period in Sydney Water's performance under this licence clause.
7.2.2	Sydney Water must use its best endeavours to comply with the memorandum of understanding with FRNSW.	SC	**IPART** has sought comments from FRNSW on Sydney Water's performance against this clause. FRNSW has noted improvements in this compliance period in Sydney Water's performance under this licence clause. We last audited this clause in 2023 and assigned a Compliant (minor shortcomings) grade. This clause does not require audit this year but the **auditor** is to check Sydney Water's progress with completing Recommendation 2023-11 by its due date (see Table 3). Sydney Water will remain assessed as Compliant (minor shortcomings) with this clause until the recommendations are completed.

7.2.3	The purpose of the memorandum of understanding with FRNSW is to form the basis for cooperative relationships between the parties. In particular, the purpose is to: a. develop the roles and responsibilities of the parties as they relate to each other; b. identify the needs and constraints of the parties as they relate to each other; and c. identify and develop strategies for efficient and effective provision of firefighting water consistent with the goals of each party.	NR	Information clause – does not require audit.
7.2.4	The memorandum of understanding with FRNSW must require the maintenance of a working group and must provide that: a. the working group must include representatives from Sydney Water and FRNSW and may include representatives from other organisations such as the NSW Rural Fire Service; and b. the working group is to consider the following matters (at a minimum): i. information sharing arrangements between Sydney Water and FRNSW; ii. agreed timelines and a format for Sydney 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 Sydney Water to consult with FRNSW in the design of new assets and planning of system maintenance, where planning indicates that minimum available flow and pressure may unduly impact firefighting in the network section under consideration; and iv. other matters as agreed by both Sydney Water and FRNSW.	SC	**IPART** has sought comments from FRNSW on Sydney Water's performance against this clause. FRNSW has made no specific comments in response to this licence clause.
8.1	**Negotiations with WIC Act licensees and Potential Competitors**		
8.1.1	Sydney Water must negotiate the provision of Services to WIC Act licensees and Potential Competitors in Good Faith.	Audit	We last audited this clause in 2020 but concluded that the clause was not triggered in that compliance period (and therefore, we did not assign an audit grade).
8.2	**Publications of servicing information**		
8.2.1	Sydney Water must, by the dates specified in this clause 8.2, publish electronically (in a form accessible from its website) at least ten years of servicing information for each major water system and wastewater system. The servicing information for each major water system and wastewater system must, at a minimum, include information on: a. current and projected demand; b. current and projected capacity constraints; c. indicative costs of alleviating or deferring capacity constraints; d. locations where further investigation is needed; and e. key sources of information used to develop the servicing information where those sources are publicly available, (the Servicing Information).	NR	Information clause – does not require audit but auditor should note this when auditing clause 8.2.

8.2.2	Sydney Water must, by 30 September 2020 (or another date approved by IPART in writing), publish electronically the Servicing Information for each major water system and wastewater system that it has available by that date that is in a form suitable for publication.	NR	Fixed deadline requirement. Completed.
8.2.3	Sydney Water must continue to publish Servicing Information for each major water system and wastewater system as it becomes available. Sydney Water must publish all Servicing Information by 30 June 2021 (or another date approved by IPART in writing).	NR	Fixed deadline requirement. Completed.
8.2.4	Sydney Water must publish updated Servicing Information for each major water system and wastewater system as soon as practicable after any such updated Servicing Information becomes available in a form suitable for publication.	SC	Audit if triggered by updates to published servicing information.
8.2.5	Sydney Water must review and update the Servicing Information for each major water system and wastewater system at least once between: a. The date that is 12 months after the initial publication of the Servicing Information for that major water system or wastewater system under clause 8.2.2; and b. 30 June 2023 (or another date approved by IPART in writing).	NR	Fixed deadline requirement. Completed.
8.2.6	Sydney Water is not required to comply with clauses 8.2.1 to 8.2.5 in relation to a particular major water system or wastewater system to the extent approved by IPART in writing. Sydney Water may apply to IPART for approval under this clause only where there are critical infrastructure security concerns in relation to a particular major water system or wastewater system.	NR	Information clause – does not require audit but auditor should note this when auditing clause 7.2.
8.3	**Code of Conduct**		
8.3.1	Sydney Water must use its best endeavours to cooperate with each WIC Act licensee to establish a code of conduct required by a WIC Act licence where Sydney Water has received a written request from the WIC Act licensee to establish such a code.	Audit	We last audited this clause in 2020 but concluded that the clause was not triggered in that compliance period (and therefore, we did not assign an audit grade).
8.3.2	Where the Minister administering the WIC Act has established a code of conduct under clause 25 of the WIC Regulation, Sydney Water will be taken to have satisfied its obligation under clause 8.3.1 by applying the code of conduct to the relevant licensee under the WIC Act.	NR	Information clause – does not require audit but auditor should note this when auditing clause 8.3.1.
9.1	**Cyber Security Management System**		
9.1.1	From the Commencement Date (or another date approved by IPART in writing), Sydney Water must maintain a Management System for cyber security of Sydney Water's Assets (the Cyber Security Management System) that covers: a. information technology environments, hardware and systems; and b. operational technology environments, hardware and systems	NR	Audited separately by Cyber Security specialist auditor.
9.1.2	From the Commencement Date (or another date approved by IPART in writing), Sydney Water must ensure that the Cyber Security Management System is fully implemented and that all relevant activities are carried out in accordance with the Cyber Security Management System.	NR	Audited separately by Cyber Security specialist auditor.
9.2	**Critical infrastructure Compliance manager**		
9.2.1	Sydney Water must nominate, by notice in writing to IPART and the Commonwealth Representative, an executive level employee as Critical Infrastructure Compliance Manager.	NR	Audited separately by Cyber Security specialist auditor.

	[Note: The reference to an executive level employee is a reference to a Level 3 employee or above under Sydney Water's structure at the Commencement Date.]		
9.2.2	Sydney Water's Critical Infrastructure Compliance Manager must be responsible for compliance with clause 9 of the Licence and Sydney Water's obligations under the *Security of Critical Infrastructure Act 2018* (Cth) and must act as the contact person for the Commonwealth Representative.	NR	Audited separately by Cyber Security specialist auditor.
9.3	**National Security Clearances**		
9.3.1	From 1 January 2020 (or another date approved by IPART in writing), Sydney Water must ensure that National Security Clearances are held by its Critical Infrastructure Compliance Manager, two board members and the executive level employees responsible for each of the following matters: a) operational technology security (including cyber security strategy, managing remote access to Assets and delivery of SCADA capability); b) network operations security (including operation, maintenance and physical security of Assets); and c) Personnel security operations (including security of Personnel and security risks posed by Personnel). *[Note: The responsibilities at (a) to (c) above may be held by a single employee or shared between multiple employees. To ensure compliance with this clause when employees resign or are on leave, Sydney Water should ensure that National Security Clearances are held by alternates with relevant experience.]*	NR	Audited separately by Cyber Security specialist auditor.
10.1	**Operational Audits**		
10.1.1	Sydney Water must cooperate with an audit undertaken by IPART or an Auditor of Sydney Water's compliance with any of the following: a. this Licence (including the Customer Contract); b. the Reporting Manual; and c. any matters specified by the Minister, (the Operational Audit).	SC	.
10.1.2	For the purpose of any Operational Audit or verifying a report on an Operational Audit, Sydney Water must, within a reasonable period of receiving a request from IPART or an Auditor, provide IPART or the Auditor with all the information in Sydney Water's possession, custody or control that is necessary to conduct the Operational Audit, including any information that is reasonably requested by IPART or an Auditor.	SC	
10.1.3	For the purpose of any Operational Audit or verifying a report on an Operational Audit, Sydney Water must permit IPART or the Auditor to: a. access any works, premises or offices occupied by Sydney 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 purpose 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 Sydney Water that are maintained in relation to the performance of Sydney Water's obligations under this Licence (including the Reporting Manual); and	SC	

	e. discuss matters relevant to the Operational Audit or any report on the Operational Audit with Sydney Water, including Sydney Water's officers and employees.		
10.2	**Reporting**		
10.2.1	IPART has the function of determining Sydney Water's reporting and auditing obligations and publishing these obligations in a reporting manual (the Reporting Manual).	NR	Information clause – does not require audit.
10.2.2	Sydney Water must comply with all of its reporting and auditing obligations set out in the Reporting Manual, including in relation to: a. water conservation and planning; b. performance standards for water quality c. performance standards for service interruptions; d. Customers and Consumers; e. information and services for competitors; f. critical infrastructure security; and g. performance monitoring and reporting.	Audit (sub-clauses (a)-(e) only) Internal IPART check sub-clauses (f) and (g)	We last audited this clause in 2021 and assigned a Non-Compliant (non-material) grade. We have not since re-audited the clause but we confirmed that Sydney Water completed the recommendation from the 2021 audit to rectify this non-compliance (Recommendation 2021-15). There are no outstanding recommendations for the auditor to check.
10.2.3	Sydney Water must: a. compile indicators of the direct impact on the environment of Sydney Water's activities (the Environment Performance Indicators). The Environment Performance Indicators must be consistent with the performance indicators specified in the Reporting Manual with an indicator number starting with 'E'; b. monitor and compile data on the Environment Performance Indicators, including data that allows a year to year comparison of the Environment Performance Indicators; and c. report on the Environment Performance Indicators in accordance with the Reporting Manual.	Audit	We last audited this clause in 2021 and assigned a Non-Compliant (non-material) grade. We have not since re-audited the clause but we confirmed that Sydney Water completed the recommendation from the 2021 audit to rectify this non-compliance (Recommendation 2021-16). There are no outstanding recommendations for the auditor to check.
10.2.4	Sydney Water must maintain sufficient record systems to enable Sydney Water to report accurately in accordance with this clause 10.2.	SC	
10.2.5	In the case of any disagreement between IPART and Sydney Water regarding the interpretation or application of any requirements of the Reporting Manual, IPART's interpretation or assessment of the application of the requirements will prevail.	NR	Information clause – does not require audit but auditor should note this when auditing clause 10.2.
10.3	**Provision of information for performance monitoring**		
10.3.1	Sydney Water must provide IPART information relating to the performance of any of Sydney Water's obligations under clause 10.2 (including providing IPART physical and electronic access to the records required to be kept under clause 10.2) within a reasonable time of Sydney Water's receiving a request from IPART for that information.	SC	
10.3.2	Sydney Water must provide IPART such information as is reasonably required to enable IPART to conduct any review or investigation of Sydney Water's obligations under this Licence within a reasonable time of Sydney Water receiving a request from IPART for that information.	SC	
10.3.3	If Sydney Water engages any person (including a subsidiary) to undertake any activities on its behalf, 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 clause 10.1 as if that person were Sydney Water.	SC	

10.3.4	If IPART or an Auditor requests information that is confidential, the information must be provided to IPART or the Auditor, subject to IPART or the Auditor entering into reasonable arrangements to ensure that the information remains confidential.	SC	
10.3.5	Sydney Water must provide NSW Health with information relating to water quality in the manner and form specified by NSW Health within a reasonable time of receiving NSW Health's request. [Note: Under section 19 of the Public Health Act 2010 (NSW), the Secretary of NSW Health may require Sydney Water to produce certain information.]	SC	

Table 2 Recommendations / outstanding items from previous audits

Recommendation number	Operational issue (licence reference where applicable)	IPART's recommendation to the Minister	Progress on Audit findings (Status as reported by Sydney Water in audit recommendations update on 31 May 2024[a])	Guidance for 2024 audit
2023-01	Drinking water Clause 4.1.3	By 31 December 2024, Sydney Water is to ensure that there is a process in place to provide contractors performing network repairs with adequate training to undertake works to the specified hygienic requirements and protect water quality (e.g. hygienic storage and repairs, adequate flushing, testing etc). In addition, a process must be in place to verify that these practices are being implemented by contractors (relates to Element 3)	New recommendation from the 2023 operational audit - On track Sydney Water advised that Water quality awareness training is scheduled to be delivered to the contractors in March 2024. Contract managers are developing audit checklists to conduct audits to ensure overall contractor performance, which includes water quality. This training will be made part of the onboarding/induction training for new contract staff to ensure this awareness is maintained.	Auditor to check Sydney Water's progress against the recommendation.
2023-02	Drinking water Clause 4.1.3	By 31 December 2024, review implementation of the process for closing incidents and undertaking incident debriefs (internal and multi-agency) as per Sydney Water's Incident Management Procedure and Incident Debrief and Investigation Procedure and undertake an awareness session with all relevant staff to enable the procedures to be fully implemented (Element 6).	New recommendation from the 2023 operational audit - On track Education and awareness program will be in place once enterprise level policies for incident management and debriefs are refined and implemented. Policy refinements are underway with completion expected by June 2024.	Auditor to check Sydney Water's progress against the recommendation.
2023-03:	Recycled water Clause 4.2.1	a) By 31 December 2024, Sydney Water must amend its existing process for connecting properties to the recycled water network to ensure that avoidable cross-connections are eliminated. b) By 31 December 2024, Sydney Water should also quantify the public health risk of existing properties and put appropriate controls in place, which may include the auditing of existing connections. This review must be undertaken in collaboration with NSW Health and the Department of Fair Trading (relates to Element 3).	New recommendation from the 2023 operational audit - On track a. Process map being developed to ensure we understand the end to end process of connections in recycled water areas, including assurance checks. Legal has undertaken a review of regulatory framework to clarify main to meter responsibility.	Auditor to check Sydney Water's progress against the recommendation.

			b. Quantifying the public health risk of existing properties is in progress. This includes identifying the number of new recycled water connections and repair works done in the last five years and assessing the risks based on the type of connections such as schools, hospitals, commercial, strata and single households. Controls include mains to meter checks. In February 2024, Sydney Water met with IPART and Fair Trading to discuss regulatory responsibility.	
2023-04	Recycled water Clause 4.2.3	By 30 June 2024, ensure stakeholder meetings are held at the required frequencies, especially those where an MoU has been developed (relates to Element 1).	New recommendation from the 2023 operational audit - On track The MoU between Sydney Water and NSW Fair Trading requires meetings to be held on a quarterly basis. Sydney Water is organising regular meetings as required by the MoU. The following meetings were held during 2023-24 YTD: • August 2023 • October 2023 • December 2023 • January 2024. Sydney Water is planning the next meeting for April 2024.	Auditor to check for completion
2023-05	Recycled water clause 4.2.3	By 30 June 2024, revise the risk assessment process to include a requirement to review the potential risk of overruns in the four yearly major risk assessment reviews. Overruns should be minimised, but where they are unavoidable the reasons for the delay should be documented, as well as the potential risk to Sydney Water in not thoroughly assessing the scheme within the four year period and an estimated date that the risk assessment will be undertaken (Element 2).	New recommendation from the 2023 operational audit - On track Risk assessments to be done in line with the Recycled Water Quality Management Plan review cycle. Document will be created for the 4 yearly review cycle, which will coincide with changes to the log reduction value (LRV) monitoring program. The business is considering the requirement to document reasons for delays (including the identification of potential risks and mitigations) in conducting risk assessments and the inclusion of this in procedure, as part of the overall review of the Recycled Water LRV monitoring program.	Auditor to check for completion.

2023-06	Recycled water clause 4.2.3	By 30 June 2024, ensure that the Recycled Water Risk Assessment Workshop Procedure is followed, and risk assessment briefing papers include the review of data for problems using trends and charts (Element 2).	New recommendation from the 2023 operational audit - On track Review of the Recycled Water Risk Assessment Workshop Procedure is currently underway and it will be updated in line with the next risk assessment workshops (Gerringong, Penrith and St Marys Advanced Water Treatment Plants).	Auditor to check for completion.
2023-07	Recycled water clause 4.2.3	By 31 December 2024, Remove the vegetation from the St Marys WRRF CCT. Review the maintenance planning process and prioritise maintenance for CCPs; ensure that the reason for any delays is recorded and assess the potential impacts on treatment performance (Element 3).	New recommendation from the 2023 operational audit - On track New Chlorine Contact Tank (CCT) is being commissioned by Major Projects which is expected to be completed by September 2024 (with risk contingency until November 2024). Sydney Water is also looking at alternate options (non preferred) related to the channel in operation. All of the alternate options which are being considered are only partially effective and have a range of different safety and process risks. The strong preference from a safety perspective is to have the tank drained to complete the activities. The path to go down any of the alternate options largely hinges on the success of the upstream dosing trial in coming weeks. All reliability operations maintenance (ROM) teams are reviewing their plans for managing vegetation in process units. This review requirement was targeted for completion by end of March 2024. At 14 March, over 50% of treatment facilities had been assessed with the remainder planned to be completed by the end of March 2024.	Auditor to check Sydney Water's progress against the recommendation.
2023-08	Recycled water clause 4.2.3	By 30 June 2024, ensure that all monitoring instruments, including handheld, are calibrated as required and appropriate records are maintained (Element 4).	New recommendation from the 2023 operational audit - On track	Auditor to check for completion.

			Action is being addressed from a water resource recovery (WRR) perspective, although St Marys will be the first to have the updated monitoring requirements implemented. Foundation work underway based on monitoring of critical control points (CCPs) instrumentation at Water Filtration sites.	
2023-09	Recycled water clause 4.2.3	By 30 June 2024, ensure that the management of incidents, including the completion of thorough investigations, is undertaken in a timely manner. Review incident management documentation with NSW Health to ensure a balance is struck between timelines and practicality, whilst managing risks to public health appropriately. In doing so, ensure that the agreed timelines are met for the notification, reporting and investigation of recycled water incidents (Element 6).	New recommendation from the 2023 operational audit - On track Refinement of policies in train, and resourcing requirements and timeframes for debrief and investigation to be augmented as a result of the review. Once the draft policies are finalised, NSW Health will be consulted (likely around June 2024).	Auditor to check for completion.
2023-10	Asset management clause 5.5.2	By 31 December 2024, Sydney Water must take action to ensure that its maintenance management processes, including the management of associated records, are fully embedded (understood and implemented) across the organisation. This should be demonstrated by (for example): evidence that focused training of relevant personnel has been undertaken; and/or records of internal audits across a representative sample of facilities and maintenance groups.	New recommendation from the 2023 operational audit - On track Maintenance processes have been implemented through Service Excellence. These include development of bottom up maintenance plan, integrated works plan and establishment of maintenance Birrang Miyas (governance forums) to measure and control the works. The current focus is on improving the maintenance management processes through these forums.	Auditor to check Sydney Water's progress against the recommendation.
2023-11	MoU with FRNSW clause 7.2.2	It is recommended that Sydney Water takes action to: a. Complete hydraulic model rebuilds and provide hydrant pressure information to FRNSW for at least six supply zones, as indicated in the *2023 24 - Water Network Model Rebuild (BAU) & FRNSW Model Pressure/Flows program,* by 30 June 2024. b. Complete hydraulic model rebuilds and provide hydrant pressure information to FRNSW for at least another six supply zones by 30 June 2025.	New recommendation from the 2023 operational audit – Delayed a. Hydraulic model rebuild is a complex exercise and requires specialised resources trained in hydraulic modelling. Sydney Water has completed the rebuilding of hydraulic models for two supply zones. The third zone (Prospect Elevated Zone) is half complete. Work has slowed due to unplanned resource changes. Current planned completion date of the remaining supply zones is 30 September 2024.	Auditor to check Sydney Water's progress against the recommendation.

		c. Agree with FRNSW, a timeline for provision of the remaining pressure information to FRNSW by 30 June 2025 (or other date agreed by IPART)	b. Sydney Water is exploring options and funding sources to build the modelling capability and complete the modelling of remaining zones. The proposed approaches being developed are targeting a resource model that will enable completion of another six supply zones by 30 June 2025, pending funding approval. c. Experience gained in the building of models up to 30 June 2025 will be used in partnership with FRNSW and Sydney Water's IPART submission personnel to propose a funding and resource model that will deliver the remaining pressure information to an agreed timeframe.	
2023-12	Recycled water clause 4.2.3	By 30 June 2024, move the St Marys Water Resource Recovery Facility (WRRF) filtration CCP turbidity meter to the outlet of the filters. (replaces Rec 2022-07).	New recommendation from the 2023 operational audit - On track Currently scoping out funding options for a new turbidity meter, or to relocate the existing turbidity meter at the St Marys WRRF. Agreement with NSW Health to ensure that schemes with filtered water turbidity as a critical control point (CCP) have turbidity meters measuring the combined filter outlet flow to verify the filter performance and ensure quality is adequate prior to disinfection. The development of the turbidity monitoring program hasn't been finalised with NSW Health at this point. Since the 2022-23 operational audit site visit to St Marys, a check has been undertaken on all sites, which identified that the same issue exists at three other sites (West Camden, Penrith and Quakers Hill). Funding approval has not been granted as yet to complete this work as OPEX.	Auditor to check for completion. (This recommendation replaces recommendation 2022-07 from the 2022 audit which was not completed but does not require re-audit.)

2022-03	Recycled water clause 4.2.1	By 30 June 2023, develop a procedure to track and respond to exceptions to the reservoir roof inspection program, including a process to prioritise delayed inspections and provide alternate inspection arrangements if reservoir roof access is unsafe. Appropriate alternative inspection arrangements and timeframes for implementation should be included in the procedure and agreed to by NSW Health. Performance reporting to NSW Health is to be reviewed as part of this action, including reporting against the Drinking Water Quality Specification reservoir inspection target (90% six monthly and three yearly inspections completed) and in addition reservoirs that have not been inspected for over 12 months should also be reported.	Recommendation from 2022 operational audit - Completed A thorough review of the reservoir inspection process was undertaken as part of the Service Excellence Accelerated Process Improvement (SEAPI) reservoir project. The recommendations of this project have been implemented, including updates to the inspection process, the tracking of inspections and alternative inspection processes. The updated inspection process and alternative inspection arrangements were provided to NSW Health and discussed at the Q4 Health JOG held in November 2023. Sydney Water has updated the Drinking Water Product Specification, with the six monthly inspection clarified as the roof integrity process relevant to drinking water quality. Whilst there is a 5 yearly reservoir (not 3 yearly) asset condition assessment, this inspection is focused on the reservoir asset condition, including corrosion, and not directly related to water quality. The Drinking Water Product Specification has been updated to reference the routine reservoir inspection program. NSW Health has reviewed the updates to the Product Specification. Sydney Water has advised NSW Health that the JOG quarterly water quality updates will include exception reporting for the reservoir roof inspection program, as part of the water quality hazard reporting processes.	Auditor to check for completion.

a Sydney Water is required to provide a report on progress by 31 March 2024 or a later date agreed by IPART. Due to the timing of the audit, the Tribunal has agreed to a later date of 31 May 2024 for Sydney Water to report on its progress with the audit recommendations

Source: IPART, *Report to the Minister - Sydney Water Corporation Operational audit 2020-21, February 2024*

Table 3 Previous field verification locations for Sydney Water's audits

Audit year	Location	Facility
2023	St Marys	Water Recycling Plant
	Prospect	Water Filtration Plant
	Rouse Hill	Water Reservoir
	Girraween	Maintenance Issue
2022	Richmond	Water Recycling Plant
	North Richmond	Water Filtration Plant
	South Windsor	Water Reservoir
	St Mary's	Maintenance Depot
2021	NA	Pipe repair
	Macarthur	Water Filtration Plant
	Liverpool	Water Recycling Plant
2020	Nepean	Water Filtration Plant
	West Camden	Water Recycling Plant
	Prospect	Water and sewer pump stations - maintenance
	Camellia	Sewer pump station - maintenance
2019	Oak Flats	Re-chlorination Plant
	Wollongong	Water Recycling Plant
	Helensburgh	Reservoir
	Woronora	Water Filtration Plant
2018	Cascade	Water Filtration Plant
	Parklea	Drinking and Recycled Water Reservoirs, and rechlorination station
	Rouse Hill	Water Recycling Plant and network
2017	Nepean	Water Filtration Plant
	Prospect	Water Filtration Plant
	Campbelltown	Reservoir
	Liverpool	Water Recycling Plant
	Guildford	Water main renewal - maintenance
2016	Orchard Hill	Water Filtration Plant
	Prestons	Maintenance Depot
	Cronulla	Wastewater Treatment Plant
2015	Parklea	Reservoir
	Box Hill	Pumping Station
	North Richmond	Water Filtration Plant

	Rouse Hill	Water Recycling Plant
2014	West Camden	Water Recycling Plant
	Warragamba	Water Filtration Plant
		South West Growth Area
2013	Macarthur	Water Filtration Plant
	Liverpool	Customer Service Centre
	Liverpool	Water Recycling Plant
	West Hoxton	Priority Sewage Project
2012	Wollongong	Water Recycling Plant
	Woronora	Water Filtration Plant
	Heathcote	Reservoir
2011	N/A	Three treated water reservoirs
	Orchard Hills	Water Filtration Plant
	Drummoyne	Mains flushing

Appendix B Field Verification Report

B.1 Overview

As part of this audit, field verification site visits were made to a number of sites/facilities to verify how effectively Sydney Water is implementing the requirements of the *Operating Licence* in practice. These visits involved inspection of facilities, observation of activities being undertaken and discussions with field personnel.

Sites/facilities inspected for the purposes of this audit included:

- Cascade Water Filtration Plant (WT 0041);
- Faulconbridge Reservoir (WS 0382) and Pumping Station (WP 0268);
- Quakers Hill Water Resource Recovery Facility (ST 0018); and
- Stonecutters Ridge Golf Course recycled water supply point.

A summary of the assets and/or activities inspected at each site, the issues reviewed and/or identified, and the observations made are set in the following sections. More detailed discussion of specific aspects or issues is presented in **Section 2**.

B.2 Cascade Water Filtration Plant (WT 0041)

B.2.1 Facility description

The Cascade Water Filtration Plant (WFP) provides drinking water to a population of around 50,000 including residential, industrial and commercial customers located in the Blue Mountains local government area. In the case of emergency, periods of high water demand, or critical operation/maintenance work, supply to as far west as Wentworth Falls can be supplemented from the Orchard Hills WFP.

Cascade WFP was commissioned in December 1993 with a nominal capacity of 54 ML/day; however, an assessment undertaken in 2016 indicates that the capacity is 37 ML/day (proven capacity 28 ML/day) for good quality raw water and 14 ML/day for poor quality raw water. It is noted that augmentation of the plant is currently being planned.

The treatment process comprises of essentially three stages:

- Pre-treatment comprising screening, oxidation, pH correction, and coagulation-flocculation, with chemical dosing to facilitate the processes.
- Filtration through six dual media filters, which operate in parallel to provide the required level of production.
- Post-treatment comprising chlorine disinfection, fluoridation and pH correction, again with chemical dosing as required to facilitate the processes.

Raw water is supplied principally via the Upper Cascade Reservoir, which is in turn supplied from other Blue Mountains storages or the Fish River Scheme. Water from the Fish River Scheme can also be supplied directly to the plant, although this mode of operation is not normally used.

Treated water is held in a single clear water storage prior to being pumped into the distribution network. There is provision for chlorine dosing into the rising mains, if required.

Sludge management facilities comprising a thickener and drying beds are also available at the plant.

B.2.2 Inspection overview

The site inspection comprised a 'walk through' of the treatment plant, generally following the process flow. This was followed by a review of critical control point settings in the SCADA system and a closer inspection of the fluoridation facilities/equipment.

B.2.3 Asset management

Observations from an asset management perspective included the following:

- The facility appeared to be generally well maintained, with no obvious deficiencies.
- The chemical storage area appeared to be in order. Chemical SDS (Safety Data Sheets), safety shower/eye washes, tanker bunding and storage bunding were all in place.
- Given its location within a national park (heavily vegetated area), fire shielding is in place around the chemical storage area, a dousing system has been installed to the roof of the plant building, and there is a designated Bushfire Shelter Area within the building (previously sighted).
- Filter No 6 was removed from service for refurbishment under the Major Periodic Maintenance program, with Filter No 1 having been completed during the audit period. This is further discussed in **section 2.3.4.1**.
- It was noted that a package of five projects aimed at renewal/upgrade of the facility is currently in the planning phase. Again, this is further discussed in **section 2.3.4.1**.
- Several assets were identified for subsequent review of maintenance and associated records, with a focus on assets associated with the fluoridation process (refer **section 2.3.4.1** for further discussion).

B.2.4 Water quality

Based on the walk through of the plant treatment train it would appear that the process as described in the *Process Flow Diagram – Cascade WFP* (PFD)[598] is consistent with the plant. There was, however, an inconsistency noted between the PFD and *Cascade Process Specification*[599] and the *Drinking Water Product Specification.*[600] The *Drinking Water Specification* requires that the primary disinfection is free chlorine, at the reservoir outlet before the first customer; however, this was noted as being total chlorine and after the first customers off the rising main to the Catalina Reservoir in the Cascade WFP documentation.

SCADA trends and interlocks were reviewed, and it was noted that all of the interlocks were in place as required; however, there was no easy way for operators to find the occasions interlocks were activated due to the critical limit being triggered. Operator log sheets were reviewed.

An in-depth review of the fluoride plant was undertaken, from the tanker unloading area, bulk storage, and Fluoride Room to the dosing point. The bulk storage tanks are located outside in a

[598] Document: *D0000890 - Cascade WFP - Process Flow Diagram (PFD).pdf.*
[599] Document: *DOC0542 - Cascade WFP Process Specification.docx.*
[600] Sydney Water, *Specification; Drinking Water Product Specification* (Version 6), 19 July 0223 (file: *IMS0152.01 - Drinking Water Product Specification.pdf*).

bunded area, which also contained the transfer pump to the Day Tank. Transfers are initiated manually using SCADA.

The was appropriate safety signage in the fluoride storage area; however, it was noted that it would be beneficial to also have signs that indicate the PPE that is required to enter into the Fluoride Room.

The Fluoride Room had a small domestic ventilation fan that did not appear to be of an adequate size, nor corrosion resistant. It was also noted that some of the electrics were in the Fluoride Room and may be susceptible to corrosion, due to the use of hydrofluorosilicic acid.

The fluoride dosing point was reviewed to determine if a better location could be found that would allow monitoring of a mixed solution, before the Clear Water Tank, as it would provide better feedback on the immediate performance of dosing. The Clear Water Tank buffers changes in concentration. No alternative was identified at the time.

An ultrasonic level sensor on the inlet channel to the Clear Water Tank is used to flow pace fluoride dosing. It was noted that this was under investigation as there had been some issues with it.

It is usual for fluoride plants to a have a separate control room with an HMI to operate the fluoride plant. The Cascade installation was unusual as it has no control room, and the plant was operated by SCADA without a local display. When interrogating SCADA, it was noted that the fluoride monitoring instrument on the Clear Water Tank could be put into 'simulation' mode for an hour.

B.3 Faulconbridge Reservoir (WS 0382) and Pumping Station (WP 0268)

B.3.1 Facility description

The Faulconbridge Reservoir site accommodates the water storage (WS 0382) and the Faulconbridge Pumping Station (WP 0268). Whilst the reservoir weas the primary focus of the inspection, the pumping station was also briefly inspected.

The reservoir is a ground-level welded steel tank, constructed circa 1955, and is fitted with lightweight aluminium sheet roofing with a steel support structure (added circa 1985). It has a nominal storage capacity of 9 megalitres.

The reservoir is fitted with separate inlet and outlet pipework. A mixer is located near the inlet, and there is a total chlorine analyser. The tank walls are protective coated and cathodic protection is fitted to further protect the internal walls and roof support structure.

The roof is fitted with access hatches for reservoir entry, vents, chlorine dosing points (for manual dosing), and points for access to the cathodic protection system/anodes. Both perimeter and radial walkways facilitate movement around/across the roof.

The pumping station comprises two (2) fixed speed pumpsets, which operate on a duty/standby arrangement. The station can deliver up to 6.79 ML/day in response to demand.

B.3.2 Inspection overview

The inspection comprised of a briefing by Sydney Water personnel followed by a 'walk-around' the base of the reservoir. The reservoir roof was accessed, and the roof and appurtenances inspected. The number of persons accessing the roof was limited due to increasing wind levels, which continued to be monitored.

The pumping station was inspected briefly from the doorway. One of the pumps was operating at the time, which prevented entry from a health (principally noise level) and safety perspective.

B.3.3 Asset management

Observations made in respect of the reservoir included:

- External coating of the tank walls was discoloured in areas; however, its integrity appeared to generally good condition. It was noted that recoating is being planned, as discussed in **section 2.3.4.1**.
- The roof observed to be in generally good condition, with sheet end sealing in place at inspected locations.
- A roof vent located at the central high point was well sealed and fitted with mesh having appropriately sized openings/aperture.
- Facilities are in place for manual chlorine dosing using tablets; there is no automated dosing at this facility.
- Corrosion of the roof support structure was identified in the vicinity of a chlorine dosing access hatch. As further discussed in **section 2.3.4.1**, this is as identified in Sydney Water inspection reports; evidence of further assessment/repair prioritisation has been provided.
- The roof was generally clear of debris, notwithstanding the proximity of substantial trees.

Observations made in respect of the pumping station included:

- The equipment appeared to be generally well maintained, with no obvious deficiencies.
- The pumpsets and electrical/control cabinets were all clearly identified and appropriately labelled.
- A chain winch located above pumpset No 1 was fitted with an inspection tag, which appears to indicate that it was last checked on 9 January 2024.

B.3.4 Water quality

From a water quality perspective, Sydney Water noted that:

- Faulconbridge Reservoir lies at the balance point between supply from the Cascade and Orchard Hills WFPs. Accordingly, there is a need to 'balance' water aesthetics for customers.
- Given the nature of the reticulation network in the area, there is a need to periodically flush 'dead end' branch lines to ensure that water quality is maintained.
- Trihalomethanes (THMs) is an issue to be managed when water is supplied from Orchard Hills WFP; this is not an issue for water supplied from Cascade WFP.

Observations from a water quality perspective included:

- It was noted that there were some challenges in maintaining a chlorine residual in the summer months. Chlorine tablets are dosed using a dispenser suspended from the reservoir roof. Some corrosion in the area around the hatch used for chlorine dosing was noted.
- The roof looked to be in good condition and no penetrations for contamination were identified.
- The total chlorine analyser and calibration records were reviewed.

B.4 Quakers Hill Water Resource Recovery Facility (ST 0018)

B.4.1 Facility description

The Quakers Hill Water Resource Recovery Facility (WRRF) provides tertiary treatment, including disinfection, of wastewater. It discharges 43 ML (nominal) of recycled water per day, which is used internally, for tankered reuse, for irrigation at the nearby Stonecutters Ridge Golf Course, or transferred to the St Marys Advanced Water Treatment Plant for further treatment. Some excess flows (dechlorinated) are discharged via Breakfast Creek to Eastern Creek.

Source water is wastewater generated in the Quakers Hill catchment, which comprises domestic, commercial and industrial waste. There are 319 industrial and 2,998 commercial trade waste agreements within the catchment area.

The Quakers Hill Sewage Treatment Plant commenced operation in 1968. Noting that extensive augmentation works have been undertaken in recent years,[601] the treatment processes comprise:

- Process Train 1 (old):
  - Preliminary Treatment (screening/grit removal); and
  - Secondary Treatment (IDAL).[602]
- Process Train 2 (new):
  - Preliminary Treatment (screening/grit removal);
  - Primary Treatment (mechanical primary screens); and
  - Secondary Treatment (AGS).[603]
- Tertiary Treatment:
  - Coagulation-Flocculation
  - Clarification; and
  - Filtration (dual media).
- Disinfection (chlorine).

Appurtenant facilities include odour control; chemical storage; wet weather bypass of the tertiary treatment processes with disinfection; and sludge (biosolids) management.

[601] Augmentation works undertaken under the Quakers Hill and St Marys WRP Treatment Process and Reliability Renewal (PARR) project.
[602] Intermittently Decanted Aerated Lagoons.
[603] Aerobic Granular Sludge technology.

B.4.2 Inspection overview

Following a brief introduction, the site inspection was undertaken in two streams:

- an inspection comprising a 'walk through' of the treatment plant, generally following the process flow, focussed on the tertiary treatment processes required for recycled water supply; and
- a review of critical control point settings in the SCADA system (from a water quality perspective) and a separate review of asset management records.

B.4.3 Asset management

Observations from an asset management perspective included the following:

- The facility appeared to be generally well maintained, with no obvious deficiencies.
- Safety provisions; signage; chemical storage provisions; etc. were all in place.
- Review of the Maximo asset management system revealed a well-structured hierarchy that covered the full scope of the facility. Records for a sample of assets (instruments and equipment) were reviewed; these are further discussed in **section 2.3.4.1**.
- It was noted that a new administration building is yet to be constructed as the final stage of the augmentation works.

B.4.4 Water quality

Observations made during the walk though of the plant confirmed that the documentation reflected the current plant arrangement.

The influent into the plant was noted as being mostly residential; the main commercial facilities, a chip factory and alcohol bottling plant, were moving out. No issues had been previously identified with raw water.

The polymer dosing system had recently been upgraded and was in the process of being optimised. Optimisation is based on jar tests as required.

Sludge blankets on the clarifiers are monitored twice a week; sludge is wasted for two hours a day on a timer. The filters backwash on a time basis and in response to head loss.

Less chlorine is required to discharge to the environment; therefore, when the recycled water pumps are not calling for water, the plant automatically reduces the dose. The recycled water pumps are interlocked on chlorine concentration. It was observed onsite that the chlorine dose was increasing in response to demand, but the pumps did not operate until the residual required was reached.

SCADA trends and interlocks were reviewed onsite. The bypass interlock was checked from an event in June 2024, CCP 1. CCP 2 was also checked during an event in April 2024, when there was an increase in turbidity (>2 NTU), and the supply was interlocked.

It was noted that there was no easy way to identify in SCADA when an interlock had been triggered through a parameter meeting a CCP Critical limit.

B.5 Stonecutters Ridge Golf Course Recycled Water Supply Point

B.5.1 Facility/inspection overview

The Stonecutters Ridge Golf Course is supplied with recycled water produced at the Quakers Hill WRRF under a commercial agreement with Sydney Water. Water is supplied into an onsite inground storage facility (dam), from where it is used for irrigation of 35 hectares of turf. Valving at the treatment plant operates in response to a level sensor located at the site; the formal handover point for supply to the Gold Club is at the inlet to the 9 megalitre (ML) capacity storage facility.

The storage is fenced to prevent unauthorised entry, with appropriate signage at the point of entry to the site: "*Recycled water storage; Avoid contact; Do not drink*". The Golf Club grounds manager advised that there is signage at the golf course entrance and around the course (not sighted), which was replaced/renewed approximately one year ago.

The storage is fitted with a manually operated potable water supply for 'top-up' purposes. The supply point is fitted with a backflow prevention device. It was advised that there is no catchment contributing rainfall to the storage (apart the surface area), which is consistent with the site observation.

The inspection comprised of a visual inspection of the dam and appurtenances (inlet and 'top up' arrangement) and discussions with the Golf Club grounds manager and Sydney Water's Business Customer Consultant.

B.5.2 Asset management

There was minimal infrastructure to observe from an asset management perspective; however, it was noted that:

- Fencing and signage was in in generally good condition.
- The Golf Club grounds manager advised that RPZ backflow prevention device and cross connection testing is undertaken annually, with results submitted to Sydney Water.

B.5.3 Water quality

It could be seen that the storage was fenced and clearly signed.

From discussions with the Golf Course representative, it was clear that appropriate onsite controls, including the following, were being implemented:

- Spray drift control; a weather station shuts off irrigation on detection of high wind.
- Limiting access, irrigating at night.
- Allowing irrigation time to dry before public access.
- Signage at the golf course entrance and storage pond.

The Golf Club undertakes soil testing three times per year and adds lime and gypsum as recommended to help manage sodification.

Appendix C List of Evidence

C.1 Introduction

A list of the evidence sighted in undertaking the audit is presented in this Appendix.

Evidence includes:

- Evidence initially provided is as referenced in Sydney Water's response to the Audit Questionnaire (filename: *2023-24 OL Audit Questionnaire.docx*).
- Evidence provided in response to requests from auditors during the audit interviews and field verification visits, as identified in the *Additional Evidence Documents Register* (filename: *SWC-Additional evidence OL 2023-24_26Sep24.xlsx*).
- Evidence provided in response to specific requests for information during the audit assessment process.
- Evidence provided in response to the Summary of Audit Findings Report (Cobbitty Consulting/Viridis, *2024 Operational Audit of Sydney Water; Summary of Audit Findings Report* (Version 2.0), 18 October 2024).

The evidence sighted is listed by document title and/or filename for each audited clause and previous recommendation in the following sections.

C.2 Detailed Audit Findings

C.2.1 Drinking Water (clause 4.1)

Sub-clause 4.1.3:

- BMIS0213.13 – Drinking Water ManagementPolicy.pdf.
- Compass-Course_outline_WQ_Awareness_training-160824.doc.
- Email-FW Sydney Water Drinking Water Management Policy-101023.msg.
- Screenshot-Sydney Water Drinking Water Management Policy-120824.png.
- Email-For action Operating Licence review requested-130624.msg.
- Connect - 3059385 – Legislative Updates 29 Apr_31 May 2024.
- D0000355 – Corporate Compliance Management System Manual.pdf.
- BMIS0213 - Drinking Water Quality Management Plan.
- 3034593 – 2022&23 Stakeholder Accountabilities Matrix.pdf.
- 2964293 – Enterprise Engagement Plan 2023-2025.pdf.
- JOG 2024 Q1 Item 2.1 2023 Q4 JOG Minutes – 13 November 2023.pdf.
- JOG 2024 Q3 Item 2.1 DRAFT JOG Minutes - 14 May 2024.docx.
- Cascade WFP – Annual Risk Assessment 2024 Summary Paper.pdf.
- Cascade Delivery System – Network WQ Risk Assessment Report 2024.pdf.
- D0000890 - Cascade WFP - Process Flow Diagram.pdf.
- Appendix F - Cascade WFP - briefing paper - annual WFP risk assessment 2024.pdf.
- Briefing Paper - Network WQ Risk Assessment, Cascade Delivery System 24.
- D0000799 Operational Risk Assessment Workshop Procedure.

- 16102023 C2C Memo-final.pdf.
- C2C Illawarra risk ass. briefing paper.pdf, C2C Illawarra risk ass. report-final.pdf, C2C Risk Register Illawarra_post-workshop.xlsx, C2C Nepean risk ass. briefing paper_final–V2.pdf, C2C Nepean risk ass. report_final.pdf, C2C Risk Register Nepean_Post-workshop.xlsx, C2C Macarthur Risk Ass. Briefing Paper.pdf, C2C Risk Register Macarthur_post-workshop.xlsx, C2C Macarthur risk ass. report–final.pdf.
- C2C Persistent Chem-Cascades Risk Reg-post-ws-for comment.
- HBT ass. Cascade_2023vFinal.
- eventhistory-5317076.pdf, PM-SACVARIOUS SITES–SWSR_SW-SAP202406-1294.msg, SAC7529 JAMIESON_JULT2024.xlsx, Extract Alarm Maint. contract CW2247139.pdf.
- 3015707 – C5.3 Manage Backflow Compliance.pdf.
- Backflow register and compliance status.xlsx.
- PN_4844293_Backflow_Reminder letter.pdf; PN_5024950_Backflow_Reminder letter.pdf & BF Reminder Letter 4363447.
- BF Disconnection Letter 4363447.pdf.
- Email-RE: RPZs on site-130824.msg.
- BF_Audit_PN4372261.
- Backflow test report-ind. trade waste customer.
- IMS0152.01 - Drinking Water Product Specification.pdf.
- Approval memo short term contingency for pre treatment Warragamba WFP_Final_endorsed.pdf.
- DOC0542 – Cascade WFP Process Specification.docx.
- IMS0152.01 - Drinking Water Product Specification.pdf.
- Cascade WFP Fluoride Overdose Incident Debrief Report_Final 230824_DA.pdf & Cascade WFP Fluoride Overdose 150624_final.pdf.
- CCP Audit_Draft.xlsx.
- CCP Testing at Cascade WFP – various.
- CCP Audit_Draft.xlsx.
- Maximo-Blue Mountains and Cascade BM Repairs-150824.xlsx.
- HAA data R394 Nth Katoomba reservoir 2023-24.xlsx.
- D0002277 – Level 0 Reservoir Inspection Process.docx.
- AIS Reservoir Inspection 23-24 YTD.xlsx.
- AISReservoir Inspection – WS0382 Faulconbridge.pdf.
- DOC0542 - Cascade WFP Process Specification.docx.
- Screenshot – Change to ferric dosing at Cascade WFP-120824.png.
- D0001778 – Prominent Dulcometer DACb Online Chlorine, pH and ORP Analyser.docx.
- WT5230 – Management of Testing, Calibration and Maintenance of Online and Laboratory Water Quality Monitoring Equipment.docx.
- Faulconbridge 23-24 WQ0027 maintenance record.xlsx.
- Screenshot – pH instrument calibration record-120824.png).
- WTCS5021 – Schedule for Equipment Maintenance procedure.

- External calibrations Cascade WFP.
- D0000643 - Approved List of Chemicals.pdf.
- Fluoride analysis report -NRA 4461 240724 FSA Sydney water IPL 4010331.pdf.
- D0001375 – Bulk Chemical Delivery.docx.
- Ferric chloride bulk chemical delivery docket-141223.pdf.
- Bulk Chem. Delivery Training Att. Aug 2024.
- 3041796 - Annual Drinking Water Compliance Monitoring Plan 2023-24.docx.
- Microbiological results-Cascades DS 2023-24.xlsx.
- FS0179 – Field Sampling Techniques.pdf.
- SOP Sampling Techniques_Koshish Pradhan_Retic Ass. 071123.
- D0001661 – Managing Customer Water Quality Complaints.docx.
- Screenshot – Complaints handling training records Customer Hub – 200824.png.
- Drinking Water Awareness Training CustomerHub.pdf.
- D0001673-Libby - Entry 1 on 1 May 24.docx.
- CRM-Cascade WQ complaints FY23-24 for OL audit-080824.docx.
- Q4 2023-24 Quarterly drinking water quality report – Cascade.pdf.
- Q4 2023-24 Quarterly Drinking Water Quality report to NSW Health.pdf.
- Folder – Labware notifications for Oxley Park and Mt Victoria incident.
- WPIMS5228 – Drinking Water Quality Event Management Plan.pdf.
- DOC0542 - Cascade WFP Process Specification.docx.
- D0001088 - Water Quality Management Contacts June 2024_Final.xlsx.
- Noggin Water Quality Hazard Incidents 2023-24.xlsx.
- Email-Hazard_ Cascade, 024-2023, Dirty Water Alert Blackheath Zone-031023.eml.
- Email-Hazard_ Cascade, 024-2023, Dirty Water Alert Blackheath Zone-031023.eml.
- 15 June 2024 AEST_ - SITERP 0001.pdf.
- Email-Hazard_ Cascade, 0006-2024 - Boddington main dosing fault-050124.eml June 2024 AEST_ - SITERP 0002.pdf.
- Email-External RE Draft Cascade fluoride incident debrief-210824.msg.
- D0000633 – WFPs Emergency Incident Scenario Testing Plan.docx.
- D0001222.28 - Cascade WFP Incident Response Manual.
- Debrief Loss or Disruption of SCADA or Telemetry 111023.docx conducted on 11 October 2023.
- CL2 leak site evac.docx conducted on 23 Jan 2024.
- D0001222.28 - Cascade WFP Incident Response Manual.
- Robert Taylor Beakon training records 1.png and Robert Taylor Beakon training records 2.png.
- WS&P Noggin User List.xlsx.
- DWQMS-DWQEMP awareness training FY 24.xlsx.
- Joint Comms Protocols_FINAL 230824.docx.
- Drinking water awareness training General Induction Day.pptx.

- Compass-Course_outline_WQ_Awareness_training-160824.doc.
- WTHQ5022- Rapid and High Rate Filtration Generic UPG (Pg 4).pdf.
- WTHQ5024- Coagulation and Flocculation Generic UPG (Pg 4).pdf.
- Attendance register - UPG training - Coagulation Flocculation -11-03-2024.pdf.
- Attendance register -UPG training - Filtration - 12-03-2024.pdf.
- Training invite -UPG Coagulation Flocculation - 11-03-24, Training invite -UPG Filtration - 12-03-24.
- Corporate Site Tour - FY 23-24.xlsx.
- WQ Awareness training FY24.xlsx.
- William Wolf NWP30210 Certificate III in Water Industry Operations certification.pdf.
- Draft Water Treatment training Matrix.xlsx.
- Email-FW External RE Water Quality presenting at Linbeck Contractors March Toolbox Talk-240724.
- Email-External RE Water Quality presentation-080824.
- Email-OL Audit Recommendations REC 2023-01 & REC 2023-09.
- Email-External Civil Contracts - Site Inspection Form Result #18804839-290424.
- Email-RE External Civil Contracts - Site Inspection Form Result #18514675-210424.
- https://www.sydneywater.com.au/about-us/our-people/who-we-are/customer-forums.html.
- https://www.sydneywater.com.au/about-us/our-organisation/our-water-our-voice.html.
- https://www.waterra.com.au/project/understanding-impacts-of-recreational-access-to-drinking-water-catchments-and-storages-in-australia/.
- https://www.waterra.com.au/project/identification-and-characterisation-of-unpleasant-taste-odour-chemicals-in-raw-water-for-informed-risk-management/.
- JEMA Management of biogenic taste and odour manuscript draft.pdf.
- RD ST Plan SUEZ-SW -2020-2023.
- SUEZ-SW R&D report - Project Brief D -Severely deteriorated raw water.
- SUEZ-SW R&D report - Project Brief D -Severely deteriorated raw water.
- 2937827 – Controlled Documents Procedure.pdf.
- 608701 – Controlled Document Standard.docx.
- Screenshot - Staff specific Compass Records for Information Management.
- Cascades Controlled Documents.
- Q4 2023-24 Quarterly drinking water quality report – Cascade.
- 2. Drinking Water Quality Compliance and Performance Report 2023-24.
- https://www.sydneywater.com.au/water-the-environment/how-we-manage-sydneys-water/safe-drinking-water/water-analysis.html.
- Briefing Paper - Network WQ Risk Assessment, Cascade Delivery System 24.pdf.
- Appendix F - Cascade WFP - briefing paper - annual WFP risk assessment 2024.pdf.
- DW and RW water audit programs_ 2024 – 2027 Final (1).ppt.
- Final QEM Warragamba-Orchard Hills DWQ Product Mgmt Audit Report 2024-04-12.
- Cascade DWQ Product Mgmt Audit Report.pdf.

- 2023 12 1MS Steering Committee_Agenda & 2023 12 14 1MS Steering Committee_slide pack.
- DWIP actions.xlsx & Tablet tracking dashboard screenshot.png.
- Extract-Oper. Risk Ass. CAP_Cascade WFP.
- 2024 Q3 CAP update.msg.

C.2.2 Recycled Water (clause 4.2)

Sub-clause 4.2.3:

- LRV review presentation to NSW Health-April2024.pptm.
- Email - LRV monitoring proposal email to NSW Health.pdf; LRV Monitoring Process Review-June 2024 and LRV Monitoring Process Review-062024.pdf.
- Secondary Process Monitoring Presentation to Health July 24.pptx.
- Secondary Process Monitoring - Minutes.docx.
- Recycled water customer meeting minutes 280624.pdf & Recycled water customer meeting minutes 120124.pdf.
- Submission - NSW Health - Sydney Water.pdf.
- PD for Water Product Specialist role.pdf; PD for Water Product Manager role.pdf and Job Description - MDR Lead - Laboratory Services - Customer Experience - EA15.pdf.
- D0000355 - Corporate Compliance Management System Manual.pdf.
- SWIM 2988479 - Compliance Accountability Register (Interim Update).pdf.
- Compliance Accountability Register Procedure.
- Compliance Accountability Register 2024 summary report.pdf.
- PD for Water Product Specialist role.pdf.
- Email-For action Operating Licence review requested-130624.msg.
- Connect - 3059385 – Legislative Updates 29 Apr_31 May 2024.
- SWIM 3034730 - Recycled Water Monitoring Plan 2023-24.pdf.
- Recycled water customer meeting minutes 120124.
- Recycled water customer meeting minutes 280624.
- WQ0005 - Recycled Water Quality Management Plan - Quakers Hill.
- Recycled Water Supply Agreement - Stonecutters Ridge Golf Course.pdf.
- Quakers Hill EPL.
- Sydney Water/NSW Health, *Memorandum of Understanding between the NSW Ministry of Health and Sydney Water Corporation*, 2 August 2021.
- JOG 2024 Q3 Item 2.1 DRAFT JOG Minutes - 14 May 2024.docx.
- D0000257.02 – Gerringong-Gerroa Recycled Water Risk Assessment.xlsx.
- Recycled water customer meeting minutes 120124.
- Recycled water customer meeting minutes 280624.
- BMIS0260.01 - Recycled Water Management Policy.docx.
- https://www.sydneywater.com.au/about-us/our-publications/policies.html.
- St Marys and Quakers Hill RWQMP Refresher Training Attendance Form.ppt.
- WQ0005 - Recycled Water Quality Management Plan - Quakers Hill.

- D0001681 – Recycled Water Risk Assessment Workshop Procedure.docx.
- D0002375 – Quakers Hill Recycled Water PFD.
- St Marys WRRF - CCP SCADA and Photos.pptx.
- WQ0008 - Recycled Water Quality Management Plan - St Marys (Version 4).
- 3034730 – Recycled Water Monitoring Plan 2023-24.pdf.
- JOG 2024 Item Q3 7.4 RW Quality Update.pptx.
- SWIM 3066265 – Quarter 4 2023-24 Quarterly Recycled Water Report to NSW Health Final.pdf.
- D0000257.01 – Gerringong Gerroa Briefing Paper.
- D0001681 – Recycled Water Risk Assessment Workshop Procedure.docx.
- D0000257.01 – Gerringong Gerroa Briefing Paper.
- LRV Monitoring Process Review-June 2024.
- D0000257.02 - Gerringong-Gerroa Recycled Water Risk Assessment.
- D0000096 - Recycled Water Product Specifications.
- D0001266 - Quakers Hill WRRF Process Specification.
- Quakers Hill WRRF - Plant Checksheet 1.
- Quakers Hill WRRF - Plant Checksheet 2.
- Quakers Hill WRRF - Plant Checksheet 3.
- SWIM 3034730 - Recycled Water Monitoring Plan 2023-24.pdf.
- Recycled Water Supply Agreement - Stonecutter's Ridge Golf Course.
- Annual Statutory Declaration 2024 – Stonecutter's Ridge Golf Course.pdf.
- Quakers Hill AUDIT Report 2023.
- Network WQ Risk Register - Prospect North Delivery System 2024.xlsx.
- Prospect North Network Water Quality Risk Report 2024.pdf.
- Quakers Hill WRRF - SCADA Recycled Water Interlocks 1.png & Quakers Hill WRRF - SCADA Recycled Water Interlocks 2.png.
- D0000096 - Recycled Water Product Specifications.docx.
- Secondary Process Monitoring Presentation to NSW Health.pptx.
- Quakers Hill WRRF – Plant Checksheets 1,2 & 3.pdf.
- Quakers Hill WRRF – Plant Diary.pdf.
- Quakers Hill WRRF - Meeting Minutes 290424.docx.
- Quakers Hill WRRF - SCADA Central Trends Free Chlorine.
- D0001344.10 - Wianamatta Hub Sampling and Analysis.
- D0001266 – Quakers Hill WRRF Process Specification.
- Quakers Hill WRRF – Callouts.xlsx.
- 260624 Chicken Minutes Quakers Hill.
- Quakers Hill WRRF - SCADA Central Trends Free Chlorine.
- Quakers Hill WRRF - CCP PMs.
- Quakers Hill WRRF – Calibration of Field Equipment Schedule 2024-25.docx.
- ACL8120 PM for FY 23-24 to present.

- 260624 Chicken Minutes Quakers Hill.
- Quakers Hill WRRF - Meeting Minutes 290424.docx.
- OS0015 – Bulk chemical data capture and assessment.
- D0001388 – Wastewater and Recycled Water Bulk Chemical Delivery.
- Quakers Hill WRRF – Chemical Delivery Ferrous Chloride.pdf.
- SBS delivery docket COC.
- Chemical Contaminant Sheet SBS Screenshot.
- Chemical Contaminant Sheet Ferrous Screenshot.
- SWIM 3034730 - Recycled Water Monitoring Plan 2023-24.
- LRV review presentation to NSW Health-April2024.
- Q3 2023-24 Stonecutters Golf Course Quarterly Client Report.pdf.
- Recycled Water Supply Agreement - Stonecutter's Ridge Golf Course.
- SWIM 3034730 - Recycled Water Monitoring Plan 2023-24.
- Recycled water customer meeting minutes 280624.pdf.
- Recycled water customer meeting minutes 120124.pdf.
- D0001661 – Managing Customer Water Quality Complaints.docx.
- Managing Customer Water Quality Complaints Training Record B Oliver.png.
- RW complaints 2023 - 2024.xlsx.
- Email: Recycled Water (Industrial) - E.coli exceedance report.eml.
- Quakers Hill WRRF – Change Management Form – CCP Interlocks.
- St Marys WRRF – Change Management Form – CCP Turbidity Meter.
- D0001088 - Water Quality Management Contacts June 2024_Final.xlsx.
- BMIS0260 – Recycled Water Quality Management Plan.docx.
- WR5271 - Recycled Water Quality Event Management Plan.docx.
- Quakers Hill WRRF - Scenario Training Out of Spec Recycled Water.
- Quakers Hill WRRF - Scenario Training First Flush.
- Corporate Site Tour - FY 23-24.xlsx.
- QH_StM RWQMP Refresher Training Package.
- St Marys and Quakers Hill RWQMP Refresher Training Attendance Form.
- OWOV Employee Session July 2024.pdf.
- Recycled water customer meeting minutes 280624.
- Recycled water customer meeting minutes 120124.
- D0001534 Production Onboarding Learning & Development Procedure.
- Cohort list WRR Cert III_Feb 23.
- New Starter Form - Cassandra Salas.
- Annual Statutory Declaration 2024 – Stonecutter's Ridge Golf Course.pdf.
- https://www.sydneywater.com.au/about-us/our-people/who-we-are/customer-forums.html.
- Customer and Community Reference Group - Summary of discussions on Purified Recycled Water.

- https://www.sydneywater.com.au/about-us/our-organisation/our-water-our-voice.html.
- https://www.sydneywater.com.au/water-the-environment/how-we-manage-sydneys-water/recycled-water-network.html.
- https://www.facebook.com/SydneyWater/videos/take-a-tour-inside-our-new-purified-recycled-water-discovery-centre-with-olympic/852721789931255.
- BMIS0260 - Recycled Water Quality Management Plan.
- PAMWP0001 – Recycled Water Treatment Plant Validation Monitoring for Pathogen Removal.docx.
- LRVs in MBRs 3050 Project Plan.docx.
- Revised-WaterRAreport-1223.docx (Pg 2).
- WaterRAProject3050 Lit Review 13323.pdf.
- Log Reduction Value Monitoring Report.
- LRV Monitoring Process Review-062024.pdf.
- Log Reduction Value Monitoring Report-062024.pdf.
- LRV review presentation to NSW Health-April2024.pptm.
- WR5271 - Recycled Water Quality Event Management Plan.
- Annual RW Quality Compliance and Performance Report 2023-24 Final.
- recycled-water-quality-report-rouse-hill Apr - Jun 2024.
- D0000257.01 – Gerringong Gerroa Briefing Paper.
- RW Audit Scoring Tool Sep 2023.
- Bingara Gorge RWQM Audit Report.
- Quakers Hill AUDIT Report 2023.
- Quakers Hill Audit Actions register.xlsx.
- CAMMS insights view Quakers.png.
- 2023 12 1MS Steering Committee Agenda.
- 2023 12 14 1MS Steering Committee slide pack.
- 2024-25 Recycled Water Quality Improvement Plan Q3 August 2024.xlsx.
- 2024-25 Recycled Water Quality Improvement Plan Q3 August 2024.xlsx.
- JOG 2024 Q3 Item 7.4 RW Quality Update.

C.2.3 Fluoridation Code (clause 4.3)

Sub-clause 4.3.1:

- Fluoride Instrument of Approval.jpeg.
- Fluoride Instrument of Approval.jpeg.
- WT0041 Cascade Fluoride Dosing System FDS.pdf.
- Endress-Hauser_Prosonic_S_FMU90_EN.pdf.
- WT0041 P7527-1.pdf.
- CHAZOP Report Fluoride Working Sheet.
- Cascade WFP - briefing paper - annual WFP risk assessment 2024.pdf.
- Fluoride dosing and flow metering.pdf.
- Pump capacity picture.pdf.

- Screenshot daily report from SCADA for 24 hour average dose.png.
- Screenshot SCADA snapshot 24 hours average dose.
- Picture of Chemical Unloading Bay layout at Cascade WFP.pdf.
- WTCS5017 Cascade WFP- Discharging water to the environment.pdf.
- D0001222.28 Cascade WFP Incident Response Manual.pdf.
- CoP 5.2.4.2 WFP Fluoride Transfer system sent to NSW Health June 2018.pdf.
- WT0041 Cascade Fluoride Dosing System FDS.
- WT0041 P7527-1.
- WT0041 P7527-1.
- CHAZOP Report Fluoride Working Sheet.
- D0001375 Bulk Chemical Delivery WWH.
- D0001378 Calib Chem Dosing Pumps.
- Fluoride certificates David B, Yuva U , Bill W, Heath B.
- Fluoride certificates Jeffrey M.
- WTCS5012.03 Cascade WFP Monthly Safety Inspection Checklist 18 April 24.pdf.
- Cascade Environmental Risk Assessment.
- CHAZOP Report Fluoride Working Sheet.
- D0001222.28 Cascade WFP Incident Response Manual.
- D0001375 Bulk Chemical Delivery WWH.
- D0001378 Calib Chem Dosing Pumps.
- D0000643 Approved List of Chemicals in Sydney Water and Change Management Process.
- Fluoride analysis report -NRA 4461 240724 FSA Sydney water IPL 4010331.
- WT5232 Quality Assurance for Receiving Bulk Chemicals Used in Drinking Water Treatment.
- 2018-BW011 Storage of fluoridating agent at Sydney Water Filtration Plants.
- Contract 28329 HFSA with Incitec Schedules F and G.pdf.
- Contract 28331 HFSA with DKSH Schedules F and G.pdf.
- Screenshot Fluoride low level setpoint to reorder.png.
- WTCS5012.01 Cascade daily lab records 4 December 2023 for Fluoride.pdf.
- External Fluoride Calibration – Fluoride_Monitor_Test_Report Cascade WFP 07082023.
- WT5127 IMS – Laboratory Determination of Fluoride using Orion 720Aplus and Dual Star pH/ISE Meters.
- WTCS5012.01 Cascade daily lab records 4 December 2023 for Fluoride.pdf.
- External Fluoride Calibration – Fluoride_Monitor_Test_Report Cascade WFP 07082023.
- Fluoride Comparison.
- WTCS5012.01 Cascade daily lab records 4 December 2023 for Fluoride.pdf.
- External Fluoride Calibration – Fluoride_Monitor_Test_Report Cascade WFP 07082023.
- WT5127 IMS – Laboratory Determination of Fluoride using Orion 720Aplus and Dual Star pH/ISE Meters.
- 2023 -24 Cascade Fluoride Compliance Grab and 8am result.

- Screenshot Fluoride alarm high and low level setpoint.png.
- Cascade Fluoride Daily Inspection Log – December 2023.pdf.
- Screenshot daily report from SCADA for 24 hours average dose.
- WTCS5012.01 Cascade Daily Lab Records 4 December 2023 for fluoride.
- Daily SCADA printout, daily run times and chemical consumption – 18/9/2024.
- 2023-24 Cascade Fluoride Compliance Grab and 8am results.
- Cascade Fluoride Daily Inspection Log – December 2023.pdf.
- 6b - Cascade - BM CM PM WO Report - FY 23-24.
- D0001378 Calib Chem Dosing Pumps and Drop test results Fluoride Cascade 23_24.xlsx.
- 2023-24 Cascade Fluoride Compliance Grab and 8am results.
- Fluoride Comparison.
- Calibration of Chemical Dosing (Drop Test) Training Attendance Aug 2024.
- Bulk Chemical Delivery Training Attendance Aug 2024.
- Fluoride certificates David B, Yuva U, Bill W, Heath B.pdf & Fluoride certificates Jeffrey M.
- IMS0152.01 - Drinking Water Product Specification.
- Cascade WFP Fluoride Overdose 150624_final.
- Email: Cascade WFP Fluoride Incident.
- Q4 2023 -24 Quarterly Drinking Water Quality Report to NSW Health Final2.pdf.
- Email: Cascade WFP Fluoride Incident.
- 15 Jun 2024 AEST_ - SITREP 0001.
- 15 Jun 2024 AEST_ - SITREP 0002.
- Fluoride certificates Jeffrey M.
- Fluoride certificates David B, Yuva U , Bill W, Heath B.
- SWC Illawarra WTP_Fluoride Audit_2023 V5.
- SWC Nepean WFP_Fluoride Audit_2023 V5.
- SWC Woronora WTP_Fluoride Audit_2023 V5.

C.2.4 Water Continuity Standard (clause 5.1)

Sub-clause 5.1.1:

- Sydney Water, *Operating Licence 2019-23; Performance Standards for Service Interruptions Report 2023-24*, undated.
- Sydney Water, *Performance Indicator Sheet; PS 1 - Water Continuity Standard OL 5.1.1 - Number of properties that experience an unplanned water interruption exceeding 5 hours* (Version 1), 1 August 2024 (file: 1. *PS -1 Water Continuity Standard FY23-24.docx*).
- Sydney Water, *Work Instruction; Unplanned Water Discontinuity Rebate* (Version 1), 1 December 2022 (file: *8. D0002142.01 Unplanned Discontinuity Water Rebate.pdf*).
- Sydney Water, *Assessing Water Service Interruptions*, undated (file: *3. Assess Water Service Interruptions.pdf*).
- Document: *7. Work Instruction Field Crews.pdf.*
- Document: *9. IICATS Alarm Handling Workflow.pdf.*
- MS Excel workbook: *2023-2024 Unplanned greater than 5 Property Count.xlsx.*

- Document: *Water Continuity_exclusion strata type props-REVISED_26Sep24.pdf.*
- Sydney Water, *Performance Indicator Sheet; PS 1 - Water Continuity Standard OL 5.1.1 - Number of properties that experience an unplanned water interruption exceeding 5 hours* (Version 1), 24 September 2024 (file: *PS -1 Water Continuity Standard-REVISED_FY23-24.pdf*).
- Document (PowerPoint presentation): *Presentation - Water Continuity_for Fail and Improvement questions.pdf.*
- Document (PowerPoint presentation): *12. Presentation_HoB Meeting_Water Continuity Trends Update_20March2024.pdf.*
- Document: *11. Lessons Identified - Water Continuity Incidents 2019-20 Report - December 2021.pdf.*
- Document (PowerPoint presentation): *16. Presentation_HoB Meeting_Hot Debrief Analysis Outcomes_20March2024.pdf.*

Sub-clause 5.1.4:

- Sydney Water, *Assessing Water Service Interruptions*, undated (file: *3. Assess Water Service Interruptions.pdf*).
- Document: *10. Screenshot -No Water_from SW web_accessed26August2024.docx.*

C.2.5 Water Pressure Standard (clause 5.2)

Sub-clause 5.2.1:

- Sydney Water, *Operating Licence 2019-23; Performance Standards for Service Interruptions Report 2023-24*, undated.
- Sydney Water, *Performance Indicator Sheet; PS 2 - Water Pressure Standard OL 5.2.1 - Number of properties that experience 12 or more water pressure failure events* (Version 1), 1 August 2023 (file: *6. PS 2 - Water Pressure Standard - OL 5.2.1 - 2023-24-rev.docx*).
- Sydney Water, *Procedure; Water Pressure Failure Analysis* (Version 4), 6 February 2023 (file: *1. DOC0333-Water pressure failure analysis.docx*).
- Sydney Water, *Work Instruction; Compiling & Assessing Pressure Failure Events* (Version 4), 21 August 2023 (file: *2. DOC0333.01-V04- Compiling & Assessing Pressure Failure Events.docx*).
- Sydney Water, *Work Instruction; Low Water Pressure Rebates* (Version 1), 1 December 2022 (file: *3. D0002142.03 - Low Water Pressure Rebates.pdf*).
- Document: 4. *DOC0333.03 Water Pressure Customer Complaint Management Process.pdf.*
- MS Excel workbook: *5. Water Pressure Standard PS 2 - Property Pressure Failure Compliance report.xlsx.*

C.2.6 Dry Weather Wastewater Overflow Standard (clause 5.3)

Sub-clause 5.3.1:

- Sydney Water, *Operating Licence 2019-23; Performance Standards for Service Interruptions Report 2023-24*, undated.
- Document: *6. EXAMPLE 1 WO 89310133.docx.*
- Document: *7. EXAMPLE 2 WO 91521037.docx.*
- Sydney Water, *Performance Indicator Sheet; PS 3 – Dry Weather Wastewater Overflow Standards OL 5.3.1 (a) and (b) …* (Version 1), 1 August 2024 (file: *9. PS 3 - Wastewater Overflow Standard FY23-24.docx*).
- Sydney Water, *Work Instruction; Wastewater desktop property affected rebate assessment* (Version 1), 1 July 2022 (file: *3. Wastewater desktop assessment and rebate process.docx*).

- Sydney Water, *Work Instruction; Unplanned Sewer Discontinuity Rebate* (Version 1), 1 December 2022 (file: *4. D0002142.04 Unplanned Sewer Discontinuity Rebate.pdf*).
- Document: *1. D0001274 – excerpt.pdf.*
- Document: *1. Processing Affected Props - excerpt.pdf.*
- Document: *2. Key information for wastewater rebate.pdf.*
- MS Excel workbook: *8. Dry Weather WWO Standard - property compliance.xlsx.*
- Documents: *11. Email - training to frontline team – 1.pdf* and *12. Email - training to frontline team – 2.pdf.*
- PowerPoint presentation: *13. Sewer overflow on private presentation 160524 (Ryde Depot).pptx.*

C.2.7 Asset management (clause 5.5)

Sub-clause 5.5.2:

- Sydney Water, Policy; *Asset Management Policy* (Version 5), February 2023 (file: *1a. AMQ0033_Asset Management Policy.pdf*).
- Sydney Water, *Strategic Asset Management Plan* (Version 7), August 2023 (file: *1b. D0000876_Strategic Asset Mgmt. Plan.pdf*).
- Sydney Water, *Asset Class Plan; Wastewater Treatment Plants (WWTP)* (Version 1), 1 July 2022 (file: *1d. D0002159 Wastewater Treatment Plant Asset Class Plan 2022.pdf*).
- Sydney Water, *Asset Class Plan; Water Network Facilities* (Version 1), 25 November 2022 (file: *1d. D0002194 Water Network Facilities - Asset Class Plan.pdf*).
- Sydney Water, *Asset Class Plan; Water Filtration Plants*, undated (file: *1d. AMQ0123 Water Filtration Plants Asset Class Plan.docx*).
- Sydney Water, *Asset Class Plan 2022; Reservoirs* (Version 6), 2 September 2022 (file: *1d. AMQ0120 Reservoir Asset Class Plan.docx*).
- SUEZ, *Strategic Asset Management Plan; Prospect Water Filtration Plant O&M* (Version 3), 2 August 2022 (file: *AM-P-001 PWFP SAMP. V3.pdf*).
- Veolia, *Strategic and Tactical Asset Management Plan; Wyuna Contract; Illawarra and Woronora Water Filtration Plants* (Revision 6), 9 April 2021 (file: *1d. Wyuna STAMP 3 - MAN-5450 - Wyuna - Strategic and Tactical Asset Management.pdf*).
- TRILITY, *Asset Management Plan; Macarthur Water Filtration Plant* (Revision 13), 31 March 2023 (file: *1d. Macarthur WFP AMP MAC-PLN-003 AMP Rev 13 Complete.pdf*).
- Document: *5a. Helix extract - Approve Project Investments - Process Overview.png.*
- Sydney Water, *Business Case Guideline* (Version 3), 1 July 2023 (file: *3e. 2936429 Business Case Guideline.docx*).
- Sydney Water, *Policy; System and Asset Planning Framework* (Version 1), 5 December 2022 (file: *3a 3005317 System and Asset Planning Framework.pdf*).
- Sydney Water, *Framework: Planning Decision Framework* (Version 4), 19 July 2023 (file: *3a. D0000732- Planning Decision Framework.pdf*).
- Sydney Water, *Water System Planning Guideline* (Version 1), September 2014 (file: *3a AMQ0562 Water System Planning Guideline.pdf.*)
- Sydney Water, *Wastewater Network Planning Guideline* (Version 2), 11 March 2021 (file: *3a D0000666 Wastewater Planning Guideline.pdf*).

- Sydney Water, *Guideline; Wastewater Treatment Planning Guidelines* (Version 1.0), 2 July 2021 (file: *3a. D0001891 Wastewater Treatment Planning Guidelines.docx*).
- Document: *5a. Leppington WW Scheme Plan.pdf.*
- Document: *5a. Leppington_North Scheme Plan.pdf.*
- Document: *5b. Assessment_CN186532_Customer Inquiry_final advice.pdf.*
- Sydney Water, *Engineering Competency Standard* (Version 4), 19 February 2021 (file: *3c. D0000833 Engineering Competency Standard.pdf*).
- Document: *6a - IN.P0000711 WT 41 Cascade WFP Pre-treatment NABC_23 Feb 24 AT - Approved LB.pdf.*
- Document: *6a Cascade Raw Water Options MCA Workshop 2_Options Summary_240305_Final.docx.*
- Document: *6a - 20031056 - 20031057 - Quakers Hill and St Marys PARR DABC and PS_20 September 2017.pdf.*
- Document: *6a - 20031056 - 20031057 - Quakers Hill- St Marys PARR VBC for Kevin J sign off.pdf.*
- Document: *6a - 20031056 - 20031057 - Reference - Quakers Hill- St Marys PARR VBC_Ver 4.0.pdf.*
- Document: *6a - Weekly interface Meeting Agenda - Quakers Hill 2024-02-13.docx.*
- Sydney Water, *Procedure; Operational Risk Assessment Workshop SOP for Drinking Water* (Version 6.0), 12 May 2023 (file: *3c D0000799 Operational Risk Assessment Workshop Procedure.docx*).
- Document: *6b - D0000890 Cascade WFP Process Flow Diagram (PFD).pdf.*
- Document: *6b - D0002375 Quakers Hill WRRF Process Flow Diagram (PFD).pdf.*
- Document: *Cascade Rounds Sheet.pdf.*
- Document: *6b - Quakers Hill Check sheet June24.pdf.*
- Sydney Water, *Policy; Asset Maintenance Policy* (Version 2), 21 November 0218 (file: *AMQ0002 - Asset Maintenance Policy.docx*).
- Sydney Water, *Standard; Maintenance Strategy* (Version 3), December 2022 (file: *D0000654 Maintenance Strategy.docx*).
- Sydney Water, *Framework; Maintenance Management Framework* (Version 2), 25 August 2023 (file: *3d. D0001854 Maintenance Management Framework.docx*).
- Document: *6b - D0000890 Cascade WFP Process Flow Diagram (PFD).pdf.*
- MS Excel workbook: *6b - Cascade - BM CM PM WO Report - FY 23-24.xlsx.*
- Sydney Water, *Cascade WFP; Briefing Paper; Annual risk assessment 2023-24*, May 2024 (file: *6b Cascade WFP - briefing paper - annual risk assessment 2024.pdf*).
- MS Excel workbook: *6b - WS0382 - BM CM PM WO Report - FY 23-24.xlsx.*
- MS Excel workbook: *6b - WP0268- BM CM PM WO Report - FY 23-24.xlsx.*
- Document: *AISReservoirInspectionPassword-18038504.pdf.*
- Document: *6b. AISReservoirInspection - WS0382 Faulconbridge.pdf.*
- Document: *6b. WS0382 Faulconbridge L1 condition report.pdf.*
- Document: *6b. Faulconbridge WS0382 Painting Scope.docx.*
- MS Excel workbook: *6b - Quakers Hill- BM CM PM WO Report - FY 23-24.xlsx.*

- Document: *6b - D0002375 Quakers Hill WRRF Process Flow Diagram (PFD).pdf.*
- Document: *6b - Quakers Hill Monthly Maintenance Meeting minutes July 2024.pdf.*
- Document: *6b - MPMApprovalForm-ST0018PMP7004_AGSS.pdf.*
- Document: *6b - 20037938MPMJobPlanST0018PMP7004.pdf.*
- Document: *6b - 143434-SydneyWater-QuakersHill-VTP (CA).pdf.*
- Document: *6b - ST0018SCN2521MPMDeferralFormFY23-24SS.pdf.*
- Document: *5c - JAM Minutes 27 06 2024.pdf.*
- Document: *5d. BMWorkOrder89973184WR1VwithSGAN1756471.pdf.*
- Document: *5d. CMWorkOrder89800686withSGAN2770597.pdf.*
- Document: *5d. PMWorkOrder89114421withSGAN1764834.pdf.*
- West Region Delivery Team, *Technical Report; Glenfield WRP; Maintenance Program PMP5005 Archimedes Pump* (Rev 0), 3 July 2023 (file: *5e - CA report from Atlas.pdf*).
- Sydney Water, *Standard; Renewals Planning Standard* (Version 6), 21 April 2021 (file: *3a - DOC0520 Asset Renewals Planning Standard.docx*).
- Sydney Water, *Facility Assets Renewal, Reliability & Business Efficiency Decision Framework* (Version 5), undated (file: *3e. AMQ0116 Facility Assets Renewal Reliability and Business Efficiency Decision Framework.docx*).
- Sydney Water, *Procedure for Production's treatment plant facilities: 5 Year Investment Plan (5YIP) Review* (Version 3), 2 November 2018 (file: *3e - D0000365-Procedure-5YIP Review-Oct18.docx*).
- Sydney Water, *Standard: Consequence of Failure* (Version 8), 30 August 2023 (file: *3e - DOC0297 Consequence of Failure Standard.docx*).
- Sydney Water, *Framework; Condition Assessment* (Version 2), August 2022 (file: *3e - D0002013 Condition Assessment Framework.docx*).
- Sydney Water, *Standard; Condition Assessment Standard* (Version 1), February 2022 (file: *3e - D0002014 Condition Assessment Standard.docx*).
- MS Excel workbook: *3e - DOC0328 Mechanical and Electrical Like for Like field based decision framework form.xlsx.*
- Sydney Water, *Decision Framework; Reservoir Major Periodic Maintenance* (Version 6), 18 August 2021 (file: *3e. AMQ0552 Reservoir Major maintenance Decision Framework.docx*).
- Sydney Water, *Business Case Guideline* (Version 3), 1 July 2023 (file: *3e. 2936429 Business Case Guideline.docx*).
- Document: *6c - CT1713 - WT41 Renew Non-Ionic Polymer - Seed Funding - APPROVED.pdf.*
- Document: *6c - LAL pmp8107.pdf.*
- MS Excel workbook: *4. Compass Report- Attendance for Finance for Non-Finance Managers Training.xlsx.*
- MS Excel workbook: *4. Compass Report- Attendance for Lead Others in an Asset Management Environment (NAT10976002).xlsx.*
- Sydney Water, *Procedure; How to use AP Tool* (Version 1), 9 February 2024 (file: *4 - How to use AP Tool.docx*).
- BSI, *Certificate of Registration; Asset Management System – ISO 55001:2014* (file: *2b. AMS Certificates 2022-2025.pdf*).

- BSI, *Assessment Report; Sydney Water Corporation*, 4 March 2024 to 20 March 2024 (file: *2b. STD2401-00 BSI March 2024 audit report 2024 audit report.pdf*).
- Sydney Water, *Procedure; Maintenance Assurance Procedure* (Version 1), 4 September 2024 (file: *D0002385.docx*).
- Document: *AV8694593 – Audit.docx*.
- Document: *SP0900 - Audit 20240719.docx*.
- Document: *10 Orchard Hills and Warragamba WFP AM Audit Report 23_24.docx*.
- Sydney Water, *State of the Assets Report FY2024* (Version 1), 12 May 2024.
- Sydney Water, *Asset Service Excellence; Final Progress Report on IPART Deliverables*, August 2024.
- Document (PowerPoint presentation): *AMS 2024 IPART OL Audit.pdf*.
- Sydney Water, *Performance Cost and Risk (PCaR) Framework*, 29 May 2024.
- Sydney Water, *Procedure; Maintenance Assurance Procedure* (Version 1), 4 September 2024 (file: *D0002385.docx*).
- PowerPoint presentation: *2a. North Head Maintenance Optimisation Comms Overview-v0.2.pptx*.
- Sydney Water, *Water Production Infrastructure Strategy* (Version A), 14 September 2024 (file: *Water Production Infrastructure Strategy.pdf*).
- Document: *API Tool Audit Screen Shots.pdf*.
- Document: *Cascade WFP MPM Workorder MAXIMO.pdf*.
- Document: *Cascade WFP MPM Workorder MAXIMO.pdf*.
- Document: *WF0527_2024-Twin weir MRS.pdf*.
- Document: *Clearwater Tank Transducer Arrangement.pdf*.
- Document: *WT0041PMP7571 Model.png*.
- Document: *WT0041PMP7571 - Technical data sheet.pdf*.
- Document: *ProMusO&M_12_7_05.pdf*.
- Document: *Cascade Rounds Sheet.pdf*.
- Document: *WTCS 5017.docx*.
- Document: *QH Photo Pressure Vessel with certificate.jfif*.
- Document: *QH Pressure Vessel Inspection Cert - Jul 23.pdf*.
- Document: *SCADA Alarm - CM WO -91792759.msg*.
- MS Excel workbook: *Filter clean out PM WO List - FY 23-24.xlsx*.
- Document: *Filter Clean PM WO 92074624.pdf*.

C.2.8 Negotiations with WIC Act licensees and Potential Competitors (clause 8.1)

Sub-clause 8.1.1:

- Sydney Water, *WIC Act licensees and potential competitors relationships report*, undated (file: *7. WIC Act Licensees and Competitor Relationships Report 2023-24.pdf*).
- Document: *Competitor relationships evidence summary 23-24.docx*.
- Documents: *Email -_External_ RE_ Conexa _ SW catch-up (Key principles shared) – 110923.msg*; *Email -RE_ _External_ RE_ Conexa _ SW catch-up (Commercial principles on extension) - 110723.msg*; and *Email -Feedback on Aquanet Contract Reset (Feedback on commercial principles) - 260923.msg*.

- Documents: *Email - Feedback on Aquanet Contract Reset (Secondary effluent supply) – 260923.msg*; *Email -RE_ _External_ RE_ Aquanet _ SW catch-up (SW feedback on secondary effluent supply terms) – 191223.msg*; *Email - RE_ _External_ RE_ Aquanet _ SW catch-up (Conexa feeback on SW terms) – 150124.msg*; *Email - RE_ _External_ RE_ Aquanet _ SW catch-up (SW feedback post 15 Jan) – 200224.msg*; *Email - RE_ _External_ RE_ Aquanet _ SW catch-up (Conexa seeking arbitration) – 010324.msg*; *and Email - RE_ _External_ RE_ AqauNet - Extending sewer mining arrangement beyond 2031 (PLACEHOLDER) – 190324.msg*.
- Documents: *Email - RE_ _External_ AquaNet - Extending sewer mining arrangement beyond 2031(SWC sent sewer mining agreement) – 270324.msg*; and *Email - RE_ _External_ AquaNet - Continuation of sewer mining (Conexa response to sewer mining agreement) – 210624.msg*.
- Documents: *Email - Direction from the Board (Indicate to SOPA not to go ahead with WRAMS Transfer) – 11102023.msg*; and *Email - RE_ Direction from the Board (EOI notification) – 281123.msg*.
- Documents: *Email - RE_ Direction from the Board (EOI notification) – 281123.msg*; *Email - RE_ _External_ Update_ SOPA Recycled Water EOI – 23042024.msg*.
- Sydney Water, *Expression of interest for recycled water supply at SOPA - TRSOPA23593*, February 2024 (file: *Doc0001-Sydney Water SOPA EOI response_Final_010224.pdf*).
- Document: *External CommercialFinancial Weekly Meeting with Sydney Desalination Plant.msg*.
- Documents: *SDP Expansion - Risk and opportunities discussion (DPESWCNSWTSDP).msg*; and *External OFFICIAL Sensitive NSW Government_ SDP PEP Assessment.msg*.
- Documents: *Email-FW_ _External_ Re_ Glossodia - 161023 and 241023.msg*; *Email-RE_ _External_ Re_ Glossodia – 061223.msg*; *Email-Re_ _External_ Re_ Glossodia – 111223.msg*; *Email-RE_ _External_ Re_ Glossodia – 210324.msg*; *Email-RE_ _External_ Re_ Glossodia – 080424.msg*; *Email-Re_ _External_ Re_ Glossodia – 250524.msg*; *Email-Fwd_ _External_ Re_ Glossodia 190724.msg*; *AG letter to SWC 31Jul24.pdf*; *215522 103 Spinks Rd, Glossodia - Feasibility Application.msg*; and *215522 103 Spinks Rd, Glossodia - Feasibility Application URGENT 02_08_24.msg*.
- Documents: *Email- _External_ FW_ Request for Recycled Water Supply or Sewer Mining at Quakers Hill STP 010724.msg*; and *Email - RE_ External_ Re_ Request for Recycled Water Supply or Sewer Mining at Quakers Hill STP 230724.msg*.
- Document: *Besmaw - Altogether Utilities Servicing Strategy.pdf*.
- Document: *3 April 2024 Sydney Water response - 251, 260R, 278, and 280-282 Captain Cook Drive, KurnellV signed.pdf*.
- Sydney Water, *WIC Act licensees and potential competitors relationships report*, undated (file: *7. WIC Act Licensees and Competitor Relationships Report 2023-24.pdf*).

C.2.9 Code of Conduct (clause 8.3)

Sub-clause 8.3.1:

- Sydney Water, *WIC Act licensees and potential competitors relationships report*, undated (file: *7. WIC Act Licensees and Competitor Relationships Report 2023-24.pdf*).

C.2.10 Reporting (clause 10.2)

Sub-clause 10.2.2:

- IPART, *Manual; Sydney Water Reporting Manual* (Issue No: D), 20 April 2022.
- Sydney Water, *Annual Water Conservation Report; 2022-23*, undated.

- Document: *Email - Transmittal to IPART - Water Conservation Report 2022-23 and updated NWI Indicators Report 2022-23 - 1 Nov 2023.pdf.*
- Document: *Water Conservation Report 2022-23_transmittal email to DPE.msg* (including attachments).
- https://www.sydneywater.com.au/about-us/our-organisation/what-we-do/operating-licence.html.
- https://www.sydneywater.com.au/water-the-environment/how-we-manage-sydneys-water/safe-drinking-water/water-analysis.html.
- Sydney Water, *Quarterly Drinking Water Quality Monitoring Report to NSW Health; Second Quarter 2023-24; 1 October 2023 to 31 December 2023* (Final), 11 February 2024 (file: *Q2 2023-24 Quarterly Drinking Water Quality report to NSW Health Final.pdf*).
- Document: *Screenshot - WQ reports to NSW Health dropbox.docx.*
- MS Excel workbook: *Monthly Fluoride Report to NSW Health April 2024.xlsx.*
- Sydney Water, *Annual Drinking Water Quality Compliance and Performance Report 2023-24*, undated.
- Sydney Water, *Annual Recycled Water Quality Compliance and Performance Report 2023-24*, undated.
- Document: *Email - Transmittal to IPART - SW OL Reports 2022-23 (1 September reports) - 1 Sept 2023.pdf.*
- Document: *E.coli detected at drinking water compliance site 14A Owen Street North Bondi-08-Oct-2024.pdf.*
- Document: *E.coli positive in WS0470 Reservoir Nattai -08-Oct-2024.pdf.*
- Document: *Cascade WFP Fluoride Overdose Incident Debrief Report_Final 230824_DA.pdf.*
- Document: *Cascade WFP Fluoride Incident.msg.*
- Sydney Water response to 2024 Audit Questionnaire (file: *2023-24 OL Audit Questionnaire.docx*).
- Sydney Water, *Operating Licence 2019–23; Performance Standards for Service Interruptions Report 2022–23*, undated.
- Document: *Email - Transmittal to IPART - SW OL Reports 2022-23 (1 September reports) - 1 Sept 2023.pdf.*

Sub-clause 10.2.3:

- Sydney Water, *Environmental Performance Indicators Report 2022-23*, undated.
- Document: *Email - Transmittal to IPART Environmental Performance Indicators Report 2022-23 (1 October report) - 26 Sept 2023.pdf.*
- Sydney Water, *Annual Environmental Performance Report 2022-23; Incorporating our Special Objectives Statement*, undated.
- https://www.sydneywater.com.au/water-the-environment/what-we-are-doing/environmental-protection.html.
- Sydney Water, Plan; *Environmental Management Monitoring and Measurement Plan* (Ref: SWEMS0010, Version 21), 26 August 2024.
- MS Excel workbooks: *01 - Energy Reporting Master - 2023-24_V01.1.xlsx*; *02a - Electricity usage and spend.xlsx*; and *02b - Gas usage and spend.xlsx.*
- Sydney Water, *Operating Licence – Environment Indicator Report – PI Sheet; Wastewater overflows system discharges* (Version 1), 13 August 2020.

- MS Excel workbook: *E3 E4_FY23-24 - Noggin - MH Network Incidents.xlsx*.
- Sydney Water, *Biosolids Annual Procedure; Standard Operating Procedure* (Ref: RSMG0029, Version 06), 13 May 2022.
- MS Excel workbook: *E5 E8_FY23-24 biosolids.xlsx*.
- MS Excel workbook: *SWEMS0015.27.xlsx* (Sydney Water Resource Use and Recovery Report).
- PowerPoint slide: *Report Waste E6 E7 2023-24.pptx*.
- MS Excel workbook: *SWEMS0015.26.xlsx* (Sydney Water Native Vegetation Clearing and Rehabilitation Report).
- PowerPoint slide: *Report Native Vegetation E8 E9 E10 2023-24.pptx*.
- Cobbitty Consulting, *Independent Assurance Practitioner's Audit Report* (Version 2.0), 20 January 2025 (file: *#20047.002 - Sydney Water 2024 NPR Audit Report (Version 2.0).pdf*).

C.3 Recommendations

C.3.1 Drinking Water (clause 4.1)

Recommendation 2022-03:

- D0002277 – Level 0 Reservoir Inspection Process.docx.
- JOG 2024 Q1 Item 2.1 2023 Q4 JOG Minutes – 13 November 2023.pdf.
- Email-RE_External_RE JOG Action Item Reservoir Roof OL recommendation-260824.msg.
- AIS Reservoir Inspection 2023-24 YTD.xlsx.
- 23-24 Workplan-Program Breakdown (Asset).

Recommendation 2023-01:

- Email-FW External RE Water Quality presenting at Linbeck Contractors March Toolbox Talk-240724.
- Email-External RE Water Quality presentation-080824.
- Email-OL Audit Recommendations REC 2023-01 & REC 2023-09.
- Email-External Civil Contracts - Site Inspection Form Result #18804839-290424.
- Email-RE External Civil Contracts - Site Inspection Form Result #18514675-210424.

Recommendation 2023-02:

- 3060582 – Incident Debrief Procedure.docx.
- 3066049 Incident Investigation Procedure.
- Email-NSW Health cons. debrief proc.
- Email dated 22 January 2025 from Sydney Water to Cobbitty Consulting (re: *REC 2023-02 - evidence of staff awareness session roll out*).

C.3.2 Recycled Water (clause 4.2)

Recommendation 2023-03:

- Process Model Aris Report.
- Cross Connection NSW Health Presentation.
- sydney-water-customer-contract-2024-28.pdf.

- Local-pumbing-regulators-in-NSW.pdf.
- WR5184 - Recycled Water Main to Meter Connection, Inspection, and Investigation.
- RW cross conn. proc mapping memo -Sept 2024.
- RW cross conn. risk assessment Sept 2024.

Recommendation 2023-04:

- Meeting Minutes – MOU Building Commission NSW 030424; Meeting Minutes – MOU Building Commission NSW 061223; Meeting Minutes – MOU Building Commission NSW 160124; Meeting Minutes – MOU Building Commission NSW 190923; Meeting Minutes – MOU Building Commission NSW 220823; Meeting Minutes – MOU Building Commission NSW 241023.

Recommendation 2023-05:

- D0001681 – Recycled Water Risk Assessment Workshop Procedure.

Recommendation 2023-06:

- D0001681 – Recycled Water Risk Assessment Workshop Procedure.
- D0000257.01 - Gerringong-Gerroa Briefing Paper.

Recommendation 2023-07:

- St Marys WRRF – CCT 1.jpg: St Marys WRRF – CCT 2.jpg.
- Process Vegetation Inspection Summary 2024.xlsx.

Recommendation 2023-08:

- D0001344 - Water Resource Recovery Common Laboratory Methods and Analysis Manual.
- Quakers Hill WRRF - Calibration of Field Equipment Schedule 2024-25.
- ACL8120 PM for FY 23-24 to present.xlsx.

Recommendation 2023-09:

- SWIM 3060582 - Incident Debrief Procedure.docx.
- 3066049 Incident Investigation Procedure.
- Email: FW: Water Quality: Post incident Debriefs and Investigation.
- Email: FW: OL Audit Recommendation 2023-09 (Investigation Procedure).

Recommendation 2023-12:

- St Marys WRRF - CCP SCADA and Photos.pptx.
- St Marys WRRF – Change Management Form – CCP Turbidity meter.
- 2024-25 Recycled Water Quality Improvement Plan Q3 August 2024.xlsx.

C.3.3 Asset management (clause 5.5)

Recommendation 2023-10:

- Sydney Water, *Terms of Reference; ROMP Construct* (v2023), undated (file: *D0002291 ROMP Guideline.docx*).
- PowerPoint presentation: *Final Draft version_OSP_07May24.pptx*.
- Sydney Water, *Procedure; Maintenance Assurance Procedure* (Version 1), 4 September 2024 (file: *D0002385.docx*).
- Document: *AV8694593 – Audit.docx*.
- Document: *SP0900 - Audit 20240719.docx*.

- Document: *10 Orchard Hills and Warragamba WFP AM Audit Report 23_24.docx*.
- Document: *10 STD2490-00 Macarthur AM Audit Report 23-24.docx*.
- Email dated 10 October 2024 from Sydney Water to Cobbitty Consulting (re: *REC 2023-10 follow-up*).
- Document: *AP Tool Training Sessions Summary.docx*.
- PowerPoint presentation: *Asset Management Awareness Jul-24.pptx*.
- Email (Sydney Water internal) dated 9 July 2024 (re: *Change Consultation for Rel & Operations Improvement and Operational Program teams*).

C.3.4 Memorandum of Understanding with FRNSW (clause 7.2)

Recommendation 2023-11:

- Document (PowerPoint presentation): *Eng Mod-Water Network Model Rebuilds-IPART Audit Sep24.pdf*.
- Document: *1 Water Network Model Rebuild (Project) - 2024_28.pdf*.
- Documents: *Email 1-15 Model RFQ Purchase Request 19July24a.pdf; and Email 2-15 Model RFQ Purchase Request 19July24b.pdf*.
- MS Excel workbook: *1 Fire Hydrant Handover Tracking Sheet - May24 - V3.xlsx*.
- Document: *Water Network Model Rebuild (Project) - 2024_28 - 25Sep24c.pdf*.
- Document: *1 Minutes - FFWG_Meeting_7Aug24 - V2.docx*.
- Document: *Email-Model Rebuild Progress_Proj Plan Prior Confirmation–26Sep24.pdf*.
- MS Excel workbook: *LGA Details for FFWG Prior-16Nov22-FRNSW Priorities.xlsx*.
- Document: *email from FRNSW confirm delivery timeline 031024.msg*.
- IPART, *Sydney Water; Operating Licence 2024-2028*, undated.

Appendix D Sydney Water Representatives

A list of Sydney Water representatives that attended audit interviews and/or field verification visits is presented in this Appendix.

Day 1 (Tuesday, 17 September 2024) – Interview sessions

Inception Meeting

Steven Blanch	A/EGM People and Governance
Ben Blayney	Head of Water Supply and Production
Nicole McCarthy	Head of Customer Hub
Angeline Chuah	A/Head of Legal and Company Secretariat
Belinda Bright	Head of Engineering and Tech Support
Louise Beer	Head of Water, Environment and Integrated Performance
Darryl Foster	Principal Manager Product and Infrastructure Performance
Corinna Doolan	Water Quality Manager
Tom Kerr	Customer Duty Manager
Graham Orgill	Engineering Modelling Senior Manager
Sen Vigneswaran	Principal Manager Product & Infrastructure Performance Insights
Sandra Spargo	Corporate Compliance Manager
Gus Garbers	Senior Compliance Analyst
Jignesh Chudasama	Senior Compliance Analyst
Bibiana Agudelo	Senior Compliance Analyst

Information and Services for Competitors

– Negotiations with WIC Act licensees and Potential Competitors

Michael English	Competition and Licencing Manager
Kate Beaty	Senior Analyst
Jennifer Ison	Business Customer Operations Lead
Kelly Taylor	Account Manager North
Roopen Niccha	Senior Commercial Manager
Christian McNally	Manager Developer Partnerships
Paul Higham	Head of Business Development
Deepti Rolla	Commercial Manager
Peter Jansen	Account Manager
Sandra Spargo	Corporate Compliance Manager
Jignesh Chudasama	Senior Compliance Analyst

Information and Services for Competitors
– *Code of Conduct*

Michael English	Competition and Licencing Manager
Kate Beaty	Senior Analyst
Jennifer Ison	Business Customer Operations Lead
Kelly Taylor	Account Manager North
Roopen Niccha	Senior Commercial Manager
Christian McNally	Manager Developer Partnerships
Paul Higham	Head of Business Development
Deepti Rolla	Commercial Manager
Peter Jansen	Account Manager
Sandra Spargo	Corporate Compliance Manager
Jignesh Chudasama	Senior Compliance Analyst

Performance Standards for Service Interruptions
– *Water Continuity Standard*

Christine Turner	Operating Licence Lead
Zane Ke	Operational Performance and Data Insights Lead
Darren Finn	Optimisation Programs Leader
Tom Kerr	Customer Duty Manager
Nora Obias	Information Specialist
Sandra Spargo	Corporate Compliance Manager
Jignesh Chudasama	Senior Compliance Analyst

Performance Standards for Service Interruptions
– *Water Pressure Standard*

Christine Turner	Operating Licence Lead
Zane Ke	Operational Performance and Data Insights Lead
Darren Finn	Optimisation Programs Leader
Krish Krishnananthan	Lead Networks Program Engineer
Nora Obias	Information Specialist
Tom Kerr	Customer Duty Manager
Sandra Spargo	Corporate Compliance Manager
Jignesh Chudasama	Senior Compliance Analyst

Performance Standards for Service Interruptions
– Dry Weather Wastewater Overflow Standard

Christine Turner	Operating Licence Lead
Zane Ke	Operational Performance and Data Insights Lead
Darren Finn	Optimisation Programs Leader
Tom Kerr	Customer Duty Manager
Soumya Bhattacharjee	Business Intelligence Specialist
Sandra Spargo	Corporate Compliance Manager
Jignesh Chudasama	Senior Compliance Analyst

Performance Monitoring and Reporting
– Reporting

Catherine Nicola	Water Conservation Project Manager
Suhanti Thirunavukarasu	Water Conservation Program Manager
Julie Ryan	Customer Compliance and Escalations Manager
David Baker	Monitor Design and Report Specialist Level 2
Ravi Raveendran	Water Product Manager
Kate Beatty	Senior Analyst
Christine Turner	Operating Licence Lead
Michael English	Competition and Licencing Manager
Nathan Ragel	Senior Compliance Analyst
Jignesh Chudasama	Senior Compliance Analyst
Sandra Spargo	Corporate Compliance Manager

Performance Standards for Water Quality
– *Drinking Water*

Darryl Foster	Principal Manager Product and Infrastructure Performance
Nigel Van	Water Product Specialist
Lucy Parsons	Water Product Senior Specialist Drinking/Recycled
Corinna Doolan	Water Quality Improvement Manager
ASM Mohiuddin	Process Manager
Colum Kearney	Water Treatment Manager
Leanne McKay	Business Resilience Specialist
Tony Venturino	Chemical Dosing Hub Manager
Ashely Cardiff	Networks Team Leader
Andrew Peters	Water Quality Scientist
Ravi Raveendran	Water Product Manager
Caleb Furner	Business Customer Accounts Manager
David Baker	Monitor Design and Reports Specialist Level 2
Juan Perez de Obanos	Systems and Assurance Lead - Product
James Milton	Senior Business Customer Operations Specialist
Gus Garbers	Senior Compliance Analyst
Bibiana Agudelo	Senior Compliance Analyst

Performance Standards for Water Quality
– *Fluoridation Code*

Darryl Foster	Principal Manager Product and Infrastructure Performance
Colum Kearney	Water Treatment Manager
ASM Mohiuddin	Process Manager
Lucy Parsons	Water Product Senior Specialist Drinking/Recycled
David Baker	Monitor Design and Reports Specialist Level 2
Karen Chia	Water Supply Manager
Corinna Doolan	Water Quality Improvement Manager
Ravi Raveendran	Water Product Manager
Gus Garbers	Senior Compliance Analyst
Bibiana Agudelo	Senior Compliance Analyst

Day 2 (Wednesday, 18 September 2024) – Field Verification Visits

Cascade Water Filtration Plant

Colum Kearney	Water Treatment Manager
Darren Azzopardi	Water Hub Manager Western
Jeff Meijnderts	Operations Team Lead
Lucy Parsons	Water Product Senior Specialist Drinking/Recycled
Yuva Upadhyaya	Senior Production Officer
Dave Brown	Production Officer Level 2
ASM Mohiuddin	Process Integration Manager
Darryl Foster	Principal Manager Product and Infrastructure Performance
Chris Dumbrell	Senior Manager Maintenance & Reliability Engineering
Sandra Spargo	Corporate Compliance Manager
Gus Garbers	Senior Compliance Analyst
Jignesh Chudasama	Senior Compliance Analyst
Bibiana Agudelo	Senior Compliance Analyst

Faulconbridge Reservoir and Pumping Station

Marek Wojnarowski	Water Quality Scientist
Daniel Judd	Lead Networks Program Engineer
Darryl Foster	Principal Manager Product and Infrastructure Performance
Chris Dumbrell	Senior Manager Maintenance & Reliability Engineering
Sandra Spargo	Corporate Compliance Manager
Gus Garbers	Senior Compliance Analyst
Jignesh Chudasama	Senior Compliance Analyst
Bibiana Agudelo	Senior Compliance Analyst

Quakers Hill Water Resource Recovery Facility

Sindu Sritharan	Production Manager Upper Wianamatta
Sajeeve Latif	Process Controller
Rebecca Lockett	Process Engineer
Jason Sylvester	Product Optimisation Manager
Katie Shield	Water Product Specialist
Ravi Raveendran	Water Product Performance Manager
Darryl Foster	Principal Manager Product and Infrastructure Performance
Chris Dumbrell	Senior Manager Maintenance & Reliability Engineering
Manoj Matthew	Hub Reliability Engineer
Hassan Abdul Khavi	Operations and Maintenance Coordinator
Paul Ambrosoli	Water Resource Recovery Lead Western
Darren Dwight	Senior Production Officer
Rafay Siddique	Production Manager Lower Wianamatta
Sandra Spargo	Corporate Compliance Manager
Gus Garbers	Senior Compliance Analyst
Jignesh Chudasama	Senior Compliance Analyst
Bibiana Agudelo	Senior Compliance Analyst

Stonecutters Ridge Golf Course Recycled Water Supply Point

Moses Ogunsola	Business Customer Consultant
Sandra Spargo	Corporate Compliance Manager
Gus Garbers	Senior Compliance Analyst
Jignesh Chudasama	Senior Compliance Analyst
Bibiana Agudelo	Senior Compliance Analyst

Day 3 (Thursday, 19 September 2024) – Interview sessions

Performance Standards for Service Interruptions

– Asset management

Louise Beer	Head of Water, Environment & Integrated Systems Performance
Daryl Foster	Principal Manager Product and Infrastructure Performance
Sen Vigneswaran	Principal Manager Product & Infrastructure Performance Insights
Chris Dumbrell	Senior Manager Maintenance & Reliability Engineering
Sandra Spargo	Corporate Compliance Manager
Jignesh Chudasama	Senior Compliance Analyst

Stakeholder Cooperation

– Memoranda of understanding with FRNSW

Belinda Bright	Head of Engineering and Tech Support
Graham Orgill	Engineering Modelling Senior Manager
Sandra Spargo	Corporate Compliance Manager
Jignesh Chudasama	Senior Compliance Analyst

Performance Standards for Water Quality

– Recycled Water

Lucy Parsons	Water Product Senior Specialist Drinking/Recycled
Katie Shield	Water Product Specialist
Ravi Raveendran	Water Product Manager
Sindu Sritharan	Production Manager Upper Wianamatta
Rebecca Lockett	Process Engineer
Michael Easton	Water Quality Scientist
Caleb Furner	Business Customer Accounts Manager
Jason Sylvester	Product Optimisation Manager
Leanne McKay	Business Resilience Specialist
Shaohua Ye	Monitoring Design and Reporting Lead
Kris Selvakumar	Lead Networks Program Engineer
Alex Robertson	Systems and Asset Lead Wastewater Treatment
Gus Garbers	Senior Compliance Analyst
Bibiana Agudelo	Senior Compliance Analyst

Cobbitty Consulting
Engineering and Advisory Services

F IPART's checks for the 2024 audit

Table F.1 Clauses that we checked as part of the 2024 audit

Operating licence clause		Compliance grade
1.8.2	To assist IPART with the End of Term Review, Sydney Water must provide IPART with such information as IPART reasonably requires. Sydney Water must provide IPART with such information as IPART requests within a reasonable time.	✓
10.2.2 (f) and (g)	Sydney Water must comply with all of its reporting and auditing obligations set out in the Reporting Manual including in relation to: a) water conservation and planning; b) performance standards for water quality; c) performance standards for service interruptions; d) Customers and Consumers; e) information and services for competitors; f) critical infrastructure security; and g) performance monitoring and reporting.	✓

Note: ✓ = Compliant

[1] S31(2)(b) of the *Sydney Water Act 1994*.
[2] IPART, *Compliance and Enforcement Policy*, December 2017.
[3] IPART, *Public Water Utility Audit Guideline*, July 2023.

ISBN 978-1-76049-782-8