

Independent Pricing and Regulatory Tribunal
New South Wales

Sydney Water Operational Audit 2019

Report to the Minister

Compliance Report
Water

December 2019

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Summary






Customers in NSW rely on safe and reliable water and wastewater services. Operating licences outline the obligations imposed by the NSW Government on publicly owned monopoly suppliers of essential services such as Sydney Water Corporation (Sydney Water). The Independent Pricing and Regulatory Tribunal of NSW (IPART) conducts annual licence audits to ensure Sydney Water meets these expectations.






This is our operational report to the Minister on the 2019 audit as required under the *Sydney Water Act 1994* (Act).¹ In the 2019 annual audit, we audited Sydney Water's compliance with 17 clauses of the *Sydney Water 2015-2020 Operating Licence* (Licence).²

Key findings

The 2019 audit found that Sydney Water had a high level of compliance with the Licence conditions. We have summarised Sydney Water's compliance with audited clauses of the Licence in Table 1 below.

Table 1 Sydney Water's compliance in 2019, the fourth year of its 2015-2020 licence


Licence part	Number of audited clauses	Compliance grade assigned				
						
Part 1 – Licence and licence authorisation	2	2	-	-	-	-
Part 2 – Water quality	4	1	3	-	-	-
Part 3 – Water quantity	-	-	-	-	-	-
Part 4 – Assets	4	3	-	1	-	-
Part 5 – Customers and consumers	4	4	-	-	-	-
Part 6 – Environment	1	-	1	-	-	-
Part 7 – Quality Management	-	-	-	-	-	-
Part 8 – Performance monitoring	-	-	-	-	-	-
Part 9 – Memorandum of understanding	1	1	-	-	-	-
Part 10 –End of Term Review	1	1	-	-	-	-
Total	17	12	4	1	-	-

Note:  = Compliant;  = Compliant (minor shortcomings);  = Non-Compliant (non-material);  = Non-Compliant (material);  = No Requirement.

Source: Viridis Consultants, 2019 Public Water Utility Audit Sydney Water Corporation, November 2019.

¹ See section 31 of the Act.

² This year our report presents an exception based summary of the audit, rather than all findings as in previous years. We discuss any audited clause which did not receive a "Compliant" grading in Chapter 2. For the full findings of the audit refer to the auditor's report in Appendix D.



The 2019 audit found:

- ▼ One Non-compliant (non-material) grade for Sydney Water's exceedance of its Water Continuity Standard (see section 4.2.2 in Table 2.2)
- ▼ Four Compliant (minor shortcomings) grades for Sydney Water's implementation of its water quality plans and reporting of its environmental indicators.

These issues are further discussed in Table 2.2.

We make six recommendations to the Minister for clauses where we did not assign a fully Compliant grade.³ These are set out in Chapter 1 of this report, and discussed in Chapter 2.

³ As per the IPART *Audit Guideline Public Water Utilities*, July 2019, auditors are only required to make recommendations for grades other than Compliant, ie for Compliant (minor shortcomings), Non-compliant (non-material) and Non-compliant (material).

1 Introduction

The 2019 audit is the fourth operational audit of Sydney Water's compliance with the requirements of the Licence. We note that the Licence expired on 29 November 2019 and a new licence commenced on 30 November 2019.⁴ The 2019 audit covers the period from 1 July 2018 to 30 June 2019.

We engaged specialist auditing firm Viridis Consultants Pty Ltd (Viridis), in partnership with Cobbitty Consulting Pty Ltd (Cobbitty), to undertake the audit on our behalf. We have prepared this report to summarise the audit findings for the Minister for Water, Property and Housing, the Hon. Melinda Pavey MP.

1.1 Recommendations

We make the following six recommendations for the clauses where we did not assign a Compliant grade⁵ to Sydney Water to ensure that compliance with the Licence is maintained. These recommendations are based on the findings of the audit by our auditor Viridis and should be read in conjunction with each of the relevant Licence clauses.

Recommendations

- 1 By 30 June 2020, establish a documented procedure for evaluating the chlorine solution used in the networks maintenance activities and for evaluating the associated supplier(s).
- 2 By 30 June 2020, ensure calibration records associated with the work instruction, *HACH 2100P Series Portable Turbidimeter – Calibration and Maintenance*, are appropriately maintained to demonstrate that the required calibrations are undertaken at the specified frequency as per the work instruction.
- 3 By 30 June 2020, ensure internal key performance indicator reporting outlined in the *Drinking Water Product Specifications* (IMS0152.01) is undertaken as required. The following actions are to be implemented:
 - A review of the target criteria for cross-connection management in the *Drinking Water Product Specifications* (IMS0152.01) is to be undertaken to ensure that new and established residential property cross-connection rates are at a level that prevents unacceptable exposure (nominally 1/1000 houses).
 - Appropriate monitoring of the targets must be established.The review must be undertaken in consultation with NSW Health.
- 4 By 31 March 2020, the recycled water risk assessments need to be more detailed to ensure that they manage risk effectively. The following actions are to be undertaken:
 - All possible modes of failure are to be assessed through the identification of hazards and hazardous events, although these may be grouped.

⁴ Sydney Water requested the Licence review be brought forward by one year, and the new operating licence was gazetted on 29 November 2019.

⁵ Compliant grade does not include Compliant (minor shortcomings) grade.

- Specific actions or procedures are identified as preventive measures to ensure the measure is understood, communicated and auditable.
- Significant risks should be clearly identified, to ensure preventive measures are in place and prioritised accordingly.
- Areas of uncertainty are to be identified to ensure that there is continual improvement in the risk assessment process.

These are to be implemented for the next revision of the Wollongong Stages 1 and 2 risk assessments.

- 5 By 31 March 2020, complete a formal debrief (including a root cause analysis) on the Punchbowl water main break to identify and develop more effective monitoring arrangements to enable timely identification of operational conditions that may affect its performance against the Water Continuity Standard.
- 6 By 30 June 2020 amend reporting of indicator E1 and E2 to include electricity consumption and renewable electricity generation by build-own-operate-transfer (BOOT) contractors.

The compliance grades are explained in Appendix A. IPART's Reporting Manual⁶ requires Sydney Water to provide a report on its progress in implementing these recommendations by 31 March 2020.

1.2 Annual statement of compliance

In preparing this report we have also considered Sydney Water's annual Statement of Compliance (Appendix E). This is an exception-based report⁷ certified by the interim CEO and the Chairman of the Board of Directors of Sydney Water. It lists all Licence non-compliances identified by Sydney Water and what remedial action has been taken, or is being taken, to resolve these non-compliances.

This year Sydney Water reported one non-compliance with the Licence on system performance standards for properties that experience unplanned water interruptions that last for more than five continuous hours.

1.3 Progress with previous recommendations

Sydney Water completed all eight of the outstanding recommendations from previous operating audits. Further information can be found in Chapter 3.

Sydney Water completed outstanding recommendations on implementation of its water quality management system to the satisfaction of NSW Health. Sydney Water implemented additional measures on cross-connection checks in the network. Recommendations relating to reporting amendments and information provisions updates were completed.

⁶ *Sydney Water Reporting Manual Operating Licence 2019-2023* (November 2019), available on our website (<https://www.ipart.nsw.gov.au/>).

⁷ This means reporting only on those clauses where Sydney Water considers it is non-compliant.

1.4 Audit scope

The 2019 audit covered the period from 1 July 2018 to 30 June 2019. The full process we followed to undertake the audit is described in Appendix B.

2 Audit findings and recommendations










This Chapter provides an exception based summary of Sydney Water's compliance with the audited clauses of the Licence. It explains the auditor's findings on audited clauses that did not achieve the highest compliance grade (Compliant).

Sydney Water has shown an overall high level of compliance with the Licence. The quality of water produced by Sydney Water continues to be of a high standard and meets public health requirements. The auditor identified shortcomings with the drinking water and recycled water clauses and in relation to reporting of environmental indicators, and a non-material non-compliance in relation to meeting the Water Continuity Standard. These shortcomings do not affect water quality or public health. These issues require attention from Sydney Water to ensure compliance is maintained.

For the clauses subject to this audit, Table 2.1 provides a snapshot of Sydney Water's non-compliances over the course of the Licence for the clauses where Sydney Water has not been assigned a Compliant grade in this year's audit. Table 2.2 provides an audit exception summary (ie, a summary of the non-compliances) and our reasoning for the assigned grade and any relevant recommendations.




The auditor has also identified some opportunities for improvement in Sydney Water's operational audit report, provided in Appendix D.

Table 2.1 2019 audit exceptions in relation to historic performance with 2015-2020 Operating Licence requirements

Licence clause	Requirement	Compliance grade				
		2015-16 ^a	2016-17 ^a	2017-18 ^a	2018-19 ^b	2019-20
2.1.1	Drinking water quality management system – consistent with ADWG	Full	High			
2.1.2	Drinking water quality management system - implementation	Full	High			
2.2.1	Recycled water quality management system consistent with AGWR	Full	High			
4.2.2	Water Continuity Standard	-	Full			
6.2.1	Environmental indicators	Full	-	-		

^a IPART, *Sydney Water Corporation Operational Audit 2018 – Report to the Minister – Compliance Report*, December 2018.



^b Viridis Consultants, *2019 Public Water Utility Audit, Sydney Water Corporation – Final Audit Report*, November 2019.


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


Note: Full = Full Compliance; High = High Compliance

Note: Please note the change in audit grades and definitions when comparing this year's audit grades with the audit grades of previous years. The audit grades in 2015-16 and 2016-17 are not directly comparable with current grades and definitions.


Table 2.2 2019 compliance with Sydney Water's operating Licence – grades other than fully Compliant

Licence clause	Requirement	Compliance grade	Audit finding	Recommendations
2.1.1	Sydney Water must maintain a Drinking Water Management System that is consistent with the Australian Drinking Water Guidelines (ADWG), except to the extent that NSW Health specifies otherwise (the Drinking Water Quality Management System).	 Compliant (minor shortcomings)	Our auditor assigned Sydney Water a Compliant (minor shortcomings) grade for clause 2.1.1. We agree with this grade. Our auditor assessed consistency with each of the 12 elements of the ADWG. The auditor noted that Sydney Water's Drinking Water Quality Management System addresses each of the elements and is consistent with the ADWG with the exception of one minor shortcoming. In particular, the auditor found that a documented procedure for evaluating chlorine solutions used in the networks has not been established.	2019-01: By 30 June 2020, establish a documented procedure for evaluating the chlorine solution used in the networks maintenance activities and for evaluating the associated supplier(s).
2.1.2	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.	 Compliant (minor shortcomings)	Our auditor assigned Sydney Water a Compliant (minor shortcomings) grade for clause 2.1.2. We agree with this grade. Our auditor noted that Sydney Water has implemented its Drinking Water Quality Management System with the exception of two minor shortcomings: ▼ A shortcoming in frequency of calibration of handheld turbidity instruments was noted. Regular calibrations ensure reliability of data. The instruments are used to verify non-microbial water quality supplied to customers in addition to the samples sent to certified labs for the same analysis.	2019-02: By 30 June 2020, ensure calibration records associated with the work instruction, <i>HACH 2100P Series Portable Turbidimeter – Calibration and Maintenance</i> , are appropriately maintained to demonstrate that the required calibrations are undertaken at the specified frequency as per the work instruction.

Licence clause	Requirement	Compliance grade	Audit finding	Recommendations
			<p>▼ Sydney Water has not met its own internal performance reporting targets for system integrity. Cross-connection testing was not included in monthly internal Customer Delivery reports. This is an area of concern for NSW Health.</p> <p>In addition, the auditor noted a gap in how Sydney Water manages its residential recycled water customers. No monitoring is undertaken of these customers which is inconsistent with the requirements of AGWR. Recommendation 3 applies to clauses 2.1.2 and 2.2.1. These minor shortcomings do not affect water quality.</p>	<p>2019-03: By 30 June 2020, ensure internal key performance indicator reporting outlined in the <i>Drinking Water Product Specifications</i> (IMS0152.01) is undertaken as required. The following actions are to be implemented:</p> <p>▼ A review of the target criteria for cross-connection management in the <i>Drinking Water Product Specifications</i> (IMS0152.01) is to be undertaken to ensure that new and established residential property cross-connection rates are at a level that prevents unacceptable exposure (nominally 1/1000 houses).</p> <p>▼ Appropriate monitoring of the targets must be established.</p> <p>The review must be undertaken in consultation with NSW Health.</p>
2.2.1	Sydney Water must maintain a Management System that is consistent with the Australian Guidelines (AGWR) for Water Recycling, except to the extent that NSW Health specifies otherwise (the Recycled Water Quality Management System).	 Compliant (minor shortcomings)	<p>Our auditor assigned Sydney Water a Compliant (minor shortcomings) grade for clause 2.2.1. We agree with this grade.</p> <p>Our auditor noted that the hazard identification and risk assessment for Wollongong WRP listed events that were general in nature. Risk description that is too general makes development and assessment of controls difficult. Sydney Water updated its risk management process and framework during the audit period, and our auditor noted areas of concern that need to be addressed in the future revisions of risk assessment. The risk assessment sampled site is due to be reviewed in 2020.</p>	<p>2019-04: By 31 March 2020, ensure the recycled water risk assessments are more detailed to manage risk effectively. The following actions are to be undertaken:</p> <p>▼ All possible modes of failure are to be assessed through the identification of hazards and hazardous events, although these may be grouped.</p> <p>▼ Specific actions or procedures are identified as preventive measures to ensure the measure is understood, communicated and auditable.</p> <p>▼ Significant risks should be clearly identified, to ensure preventive measures are in place and prioritised accordingly.</p>

Licence clause	Requirement	Compliance grade	Audit finding	Recommendations
				<p>▼ Areas of uncertainty are to be identified to ensure that there is continual improvement in the risk assessment process.</p> <p>These are to be implemented for the next revision of the Wollongong Stages 1 and 2 risk assessments.</p>
4.2.2	<p>Water Continuity Standard</p> <p>a) Sydney Water must ensure that, in any financial year:</p> <p>i) no more than 40,000 Properties experience an Unplanned Water Interruption that lasts for more than five continuous hours; and</p> <p>ii) no more than 14,000 Properties experience three or more Unplanned Water Interruptions that each lasts for more than one hour (the Water Continuity Standard).</p>	 <p>Non-Compliant (non-material)</p>	<p>Our auditor assigned Sydney Water a Non-compliant (non-material) grade for clause 4.2.2. We agree with this grade.</p> <p>Sydney Water notified IPART on 4 July 2019 that it had exceeded the Water Continuity Standard for unplanned water interruptions that last for more than five hours. Sydney Water exceeded the Licence limit by more than 25%, with one significant water main break⁸ accounting for a third of Properties affected in 2018-19.</p> <p>The auditor found that Sydney Water's approach to the management of Unplanned Water Interruptions is consistent with typical industry practice. The auditor found that Sydney Water has appropriate processes in place for the management of such incidents, and that the failure to comply with the standard was not the result of a systemic failure of process. The auditor also noted that drought conditions typically result in increased numbers of water main breaks.</p>	<p>2019-05: By 31 March 2020, Sydney Water is to complete a formal debrief (including a root cause analysis) on the Punchbowl water main break to identify and develop more effective monitoring arrangements to enable timely identification of operational conditions that may affect its performance against the Water Continuity Standard.</p>

⁸ On 10 April 2019, a break in a critical water main in Punchbowl resulted in the emptying of the East Hills Reservoir, causing loss of service to approximately 18,000 Properties for longer than five continuous hours.

Licence clause	Requirement	Compliance grade	Audit finding	Recommendations
			The auditor found that the incident was appropriately escalated and the response and repair was undertaken as efficiently as possible. The auditor considered the non-compliance to be non-material because it did not result in failure to assure controlled processes, products or outcomes.	
6.2.1	<p>Environmental indicators Sydney Water must:</p> <p>a) prepare indicators of the direct impact on the environment of Sydney Water's activities (the Environmental Performance Indicators);</p> <p>b) monitor and compile data on the Environmental Performance Indicators; and</p> <p>c) report on the Environmental Performance Indicators in accordance with the Reporting Manual.</p>	 <p>Compliant (minor shortcomings)</p>	<p>Our auditor assigned Sydney Water a Compliant (minor shortcomings) grade for clause 6.2.1. We agree with this audit grade. Our auditor noted that energy consumption figures reported in indicator E1 did not include data from assets operated by contractors to Sydney Water. A significant portion of the assets used to provide water and wastewater services in Sydney are operated by contractors, which would have a significant impact on the reported energy consumption. Sydney Water's other indicators were consistent with requirements. However, this indicator requires Sydney Water to report on all energy consumption due to Sydney Water's activities. There is no distinction in the Licence clause to exclude the energy consumption from assets operated by a third-party on behalf of Sydney Water.</p>	<p>2019-06: By 30 June 2020 Sydney Water is to amend its reporting of indicator E1 and E2 to include electricity consumption and renewable electricity generation by build-own-operate-transfer (BOOT) contractors.</p>

Source: Viridis Consultants, 2019 Public Water Utility Audit, Sydney Water Corporation— Final Audit Report, November 2019.

3 Progress on previous audit recommendations

The previous audits in 2017 and 2018 identified areas where Sydney Water was not fully Compliant with the Licence obligations. We made recommendations to Sydney Water to address these issues.⁹ The following table outlines Sydney Water's progress in implementing these recommended actions.

Commendably, Sydney Water has implemented all eight outstanding audit recommendations. The previous recommendations are shown in Table 3.1.

Table 3.3.1 Sydney Water's progress in 2019 to address our recommendations from the previous audits

	Recommendation	Progress
2016-17-5	By 30 June 2018: b) in consultation with NSW Health, review the preventive measures for end user sites (on-site preventive measures) as documented in the recycled water management system and supporting material, including the content of the Annual Declaration and compliance inspection checklist, to ensure they are appropriate to the level of risk.	Complete NSW Health, in their submission prior to the audit, confirmed that consultations had taken place and the user agreements were being updated. The auditor considered that the requirements for this recommendation have been met.
2016-17-6	By 30 June 2019: a) ensure Sydney Water staff and contractors who are responsible for verifying the onsite preventive measures are trained and assessed as competent to implement their responsibilities b) establish and implement a process for on-going competency assessment, and c) review all end user sites to confirm end users are meeting their obligations under their end user agreement or the Recycled Water Quality Management Plan and implement the interruption to supply process where appropriate.	Complete Sydney Water reviewed the role and associated skills of responsible staff, and the extent of their role in verification of onsite preventive measures, in consultation with NSW Health. Relevant Sydney Water staff will complete annual refresher training specific to the recycled water schemes they are responsible for. A process of 6-monthly meetings between Sydney Water and end user, and annual statutory declarations by the end users has been improved in liaison with NSW Health and is being implemented.
2018-01	By 30 June 2019, ensure reservoir roofs, in particular the Parklea drinking water reservoir, have been inspected safely as per the reservoirs inspection schedule, including with the required safety equipment and associated training.	Complete Sydney Water provided evidence of inspector training records and reservoir inspections, including Parklea.

⁹ IPART, *Sydney Water Corporation Operational Audit 2018, Report to the Minister*, December 2018.

	Recommendation	Progress
2018-02	By 30 June 2019, have processes in place to document target finish dates, priorities, revised dates and reasons for delay in implementing improvement actions on drinking water.	Complete Sydney Water improved its Drinking Water Product Improvement Plan as recommended, and developed a dashboard to summarise actions in the Improvement Plan. The progress of Improvement Actions is now a standing item on meeting agendas with NSW Health.
2018-03	By 31 March 2019, test all main to meter pipes to prevent cross-connections prior to the supply of recycled water from Sydney Water's main to any properties within Sydney Water's dual reticulation schemes and establish a hold point prior to supply of recycled water.	Complete The process for testing all main to meter connections has been reviewed and modified to include an appropriate hold point. Sydney Water demonstrated that there were no outstanding tests.
2018-04	By 30 June 2019, have processes in place to document target finish dates, priorities, revised dates and reasons for delay in implementing improvement actions on recycled water product and recycled water schemes.	Complete Sydney Water revised its Recycled Water Improvement Plan as recommended, and developed a dashboard to summarise actions in the Improvement Plan. The progress of Improvement Actions is now a standing item on meeting agendas with NSW Health.
2018-05	By 30 June 2019, update the pamphlet prepared under clause 5.2.1 to include or refer to information regarding the ability for a customer to enter into agreements with Sydney Water (separate to the Customer Contract) for the provision by Sydney Water of services to the customer.	Complete Sydney Water updated the pamphlet as recommended.
2018-06	By 30 June 2019, review data extraction processes for reporting against the Wastewater Overflow Standard to ensure an improvement in the reporting of the actual number of events.	Complete Sydney Water reviewed the data extraction process and updated it to improve the reporting.

Source: IPART, *Sydney Water Corporation Operational Audit 2018, Report to the Minister*, December 2018.








Appendices



A Compliance grades

Table A1: Current compliance grades

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

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

Pre-2018 compliance grades

We abbreviate pre-2018 compliance grades according to the following convention:

- ▼ **Full** = Full Compliance
- ▼ **High** = High Compliance
- ▼ **Adeq** = Adequate Compliance
- ▼ **NC** = Non-compliant
- ▼ **NR** = No Requirement

B Audit process

B.1 Audit programme

In developing our 5-year audit programs and annual audit scopes for Sydney Water we apply IPART's *Compliance and Enforcement Policy, December 2017*. This policy sets out our risk-based regulatory model. Under this policy, we can:

- ▼ Focus on allocating resources to areas of higher risk
- ▼ Increase our efficiency
- ▼ Tailor our enforcement response.

We base our risk-based approach on evaluating the risk that each part of our regulatory function aims to reduce. We evaluate the risk 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 allocation of resources in proportion to the risk and complexity of regulated entities and 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.

B.2 2019 audit scope

We do not audit every licence clause each year, instead we adopt a risk-based audit approach. This means we audit 'high risk' clauses more frequently and 'low risk' clauses less frequently. We audit all requirements of the licence at least once during the 5-year term of the licence. Audits are conducted in accordance with our *Audit Guideline – Public Water Utilities* (Audit Guideline) which is available on our website.

Following the risk-based approach, the audit scope for this year included licence obligations on:

- ▼ Licence and licence authorisation (Part 1) – requirements on licence availability and connections of services and pricing.
- ▼ Water quality (Part 2) – requirements on drinking water and recycled water.
- ▼ Assets (Part 4) – requirements on asset management system and systems performance standards.
- ▼ Customer and consumers (Part 5) – requirements on providing information, assistance options for payment difficulties and actions for non-payments, and internal complaints handling.

- ▼ Environment (Part 6) – requirements on environmental performance indicators.
- ▼ Memorandum of understanding (Part 9) – requirements on maintaining memorandum of understanding with Fire and Rescue NSW.
- ▼ End of term review (Part 10) - requirements on information provision.

Applying the risk-based approach used in the auditing program, we did not audit clauses from Part 3 (Water quantity), Part 7 (Quality Management), Part 8 (Performance monitoring), Part 11 (Notices) and Part 12 (Definitions and interpretations) this year.

We consulted with the NSW Ministry of Health (NSW Health), NSW Environment Protection Agency (EPA), Fire and Rescue NSW and the Department of Planning, Infrastructure and Environment (DPIE), and sought public submissions in determining the scope of the audit. The audit scope is provided in Appendix C. All submissions from stakeholder agencies indicated stakeholders were generally satisfied that Sydney Water had met its obligations under the Licence relevant to their portfolio.

We had regard to the following comments in finalising the audit scope:

- ▼ NSW Health¹⁰ identified the following areas of interest:
 - Risks related to backflow and connection/cross-connection of drinking water services (considered in the review of licence clauses 2.1.1 and 4.2.2).
 - Inclusion of build-own-operate-transfer (BOOT) contract plants in Sydney Water’s drinking water quality management system (DWQMS) including critical control points, alarms, and supervisory control and data acquisition (considered in review of licence clauses 2.1.2 and 4.2.2).
- ▼ EPA¹¹ identified incidents relating to dry weather sewage overflows (considered in review of clause 4.1.5).
- ▼ Fire and Rescue NSW¹² sought greater understanding of water network flow and pressure information for firefighting purposes (considered in clause 9.4.2).

We received no submissions from members of the public on the 2019 audit scope.

B.3 2019 audit plan

We engaged Viridis Consultants Pty Ltd (Viridis), in partnership with Cobbitty Consulting Pty Ltd (Cobbitty), to undertake the 2019 audit of Sydney Water.

We held a project start-up meeting with the auditor on 17 July 2019 to agree on the project milestones, audit timing, and outline our expectations. We also held an audit inception meeting with Sydney Water and the auditor on the first day of the audit interviews, on 9 September 2019. At this meeting, expectations and protocols for the conduct of the audit were agreed. All parties adhered to the agreed protocols throughout the audit.

¹⁰ Letter from NSW Health, 8 July 2019.

¹¹ Letter from EPA, 5 July 2019.

¹² Letter from Fire & Rescue NSW, 2 July 2019.

We required the auditor to undertake the following tasks:

1. Receive stakeholder submissions and comments for inclusion in the audit scope.
2. Prepare an information request (questionnaire) setting out all the requirements for information and evidence, at least two weeks prior to the commencement of audit interviews.
3. Review reports and documents provided by Sydney Water in response to the questionnaire.
4. Conduct interviews with Sydney Water staff at its offices.
5. Conduct field verification and assess the implementation of Sydney Water's systems and procedures.
6. Assess the level of compliance (according to our compliance grades) Sydney Water achieved for each of the identified obligations of the licence 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 drafts of the audit report to us and address comments from Sydney Water and us regarding draft audit findings.
10. Prepare a final report outlining audit findings (Appendix D).

Our auditor adopted a methodology consistent with *ISO 19011 Guidelines for Auditing Management Systems*. This guideline defines the requirements of an audit, ensuring that it is conducted in accordance with an established and recognised audit protocol. Where appropriate, the auditor also sought guidance from *ISO 55001:2014 Asset management system – Requirements*.

Our auditor also carried out the audit according to our *Audit Guideline - Public Water Utilities, July 2019*.¹³ Under this guideline, the auditor can make recommendations or suggest opportunities for improvement.

Where we support an auditor's recommendation, we make our recommendation based on the auditor's recommendation. Our recommendations are summarised in section 1.1 of this report.

Where the auditor suggested opportunities for improvement, Sydney Water can decide whether to implement these suggestions. This approach should balance improved performance with the investment required to achieve it. That is, we want Sydney Water to first consider the pricing implications and value for money of continued improvement. As a consequence, while we encourage Sydney Water to consider the auditor's suggestions, we do

¹³ Available on our website (<https://www.ipart.nsw.gov.au/>). The latest version of the Audit Guidelines was released in July 2019.

not follow these up. The auditor's suggested opportunities for improvement are included in the auditor's report in Appendix D.

Our auditor conducted audit interviews from 9 to 11 September 2019 at Sydney Water's office in Parramatta. On 10 September 2019, the auditor also undertook a site visit to the following locations:

- ▼ Oak Flats Re-chlorination Plant
- ▼ Wollongong Water Recycling Plant
- ▼ Helensburgh Reservoir
- ▼ Woronora Water Filtration Plant.

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

C 2019 audit scope

Note: The audit scope was prepared prior to contacting stakeholders (see Appendix B for stakeholder comments).

2019 operational audit scope Sydney Water Corporation

2019 audit scope

This document sets out the 2019 operational audit scope for Sydney Water Corporation (Sydney Water).

This scope is based on the 5-year audit program for Sydney Water's 2015-2020 Operating Licence. Auditors should note any directions in the comments column of Table 2.

Audit period

The audit period is 1 July 2018 to 30 June 2019.

Outstanding audit recommendations

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

Statement of compliance

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

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

Development and implementation of management systems

Where a management system needs to be developed and/or implemented by a date outside the audit period, we have requested the utility provide a verbal update on progress during the audit interviews. The purpose is to inform us and the auditor of progress made toward developing an effective management system by the date set out in the licence.

Interpretation

In the case of any discrepancies between the Sydney Water Operating Licence 2015-2020 (licence) and the audit scope, the licence will prevail.

Table 1 Key

Requirement	Meaning
Audit/Review	Audit/review clause in the 2019 audit
SC	Audit of this clause not required in the 2019 audit unless the utility's Statement of Compliance identifies a non-compliance or we become aware of other reasons to audit the clause.
NR	No requirement for audit.

Table 2 2019 Audit scope for Sydney Water Corporation

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
1	Licence and licence authorisation		
1.1	Objectives of this licence		
1.1.1	The objective of the licence is to enable and require Sydney Water to lawfully provide the services within its area of operations. Consistent with this objective, the licence requires Sydney Water to: <ul style="list-style-type: none"> a) meet the objectives and other requirements imposed on it in the Act and other relevant legislation b) comply with the quality and performance standards in the licence c) recognise the rights given to customers and consumers d) be subject to audits of compliance with the licence. 	NR	
1.2	Licence authorisation		
1.2.1	The licence is granted to enable and require Sydney Water to provide, construct, operate, manage and maintain efficient, co-ordinated and commercially viable systems for providing the services throughout the area of operations.	SC	
1.3	Stormwater drainage system		
1.3.1	Sydney Water must 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 service to be provided by another appropriate body, including a council (within the meaning of the Local Government Act 1993 (NSW)).	SC	
1.3.2	Sydney Water may provide, construct, operate, manage and maintain efficient, co-ordinated and commercially viable Stormwater Drainage Systems and Services within the Area of Operations including for the purpose of increasing the capacity of the Stormwater Drainage System included in the business undertaking (referred to in Part 3 of the Act) 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.	SC	

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
1.4	Term of this licence		
1.4.1	The term of the licence is five years from the commencement date. [Note: the Commencement Date is 1 July 2015, which means that the term of this Licence will end on 30 June 2020.]	NR	
1.5	Licence amendment		
1.5.1	Subject to the Act and clause 1.5.2, this Licence may be amended by the Governor by notice in the New South Wales Government Gazette.	NR	
1.5.2	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	
1.6	Connection of services		
1.6.1	Subject to any applicable laws, Sydney Water must ensure that Drinking Water and Wastewater Services are available on request for connection to any Property situated in the Area of Operations.	SC	
1.6.2	Connection to Sydney Water's systems for the supply of Services relating to Drinking Water and Wastewater is subject to any conditions that Sydney Water may lawfully determine to ensure the safe, reliable and financially viable supply of its Drinking Water and Wastewater Services to Properties situated in the Area of Operations in accordance with this Licence.	SC	
1.7	Non-exclusive licence		
1.7.1	The licence does not prohibit another person from providing services in the area of operations that are the same as, or similar to, the services, if the person is lawfully entitled to do so.	NR	
1.8	Availability of Licence		
1.8.1	Sydney Water must make a copy of this Licence available to any person, free of charge: a) website for downloading b) upon request made to the contact centre.	Audit	This is the first audit of this clause in this licence period.
1.9	Pricing		
1.9.1	Sydney Water must set the level of fees, charges, and other amounts payable for its Services subject to the terms of the licence, the Act and the maximum prices and methodologies for Services determined from time to time by IPART under the IPART Act.	Audit	We last audited this clause in 2018. We assigned a Non-Compliant Non-Material grade. Sydney Water was also non-compliant in 2015 (previous licence), 2016 and 2017.

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
2	Water quality		
2.1	Drinking water		
2.1.1	<p>Sydney Water must maintain a Management System that is consistent with the Australian Drinking Water Guidelines, except to the extent that NSW Health specifies otherwise (the Drinking Water Quality Management System).</p> <p>[Note: Sydney Water is to implement the Drinking Water Quality Management System to the Drinking Water system under its control in light of its knowledge of the entire drinking water supply system (from the water catchment to the Consumer).</p> <p>It is expected that the Drinking Water Quality Management System will be consistent with the Framework for Management of Drinking Water Quality. However, where NSW Health considers it appropriate, the application of the Australian Drinking Water Guidelines may be amended or added to, to take account of Sydney Water's circumstances and/or Drinking Water quality policy and practices within New South Wales.]</p>	Audit	<p>We last audited this clause in 2018. We assigned a Compliant grade.</p> <p>We will contact NSW Health to comment on Sydney Water's performance against this clause.</p> <p>Drinking water is the highest risk aspect of this utility's operations. The system must be consistent with the Australian Drinking Water Guidelines except to the extent that NSW Health specifies (specification from NSW Health must be consistent with the requirements of clause 2.1.4 below).</p>
2.1.2	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.	Audit	<p>We last audited this clause in 2018. We assigned a Compliant Minor Shortcomings grade.</p> <p>We will contact NSW Health to comment on Sydney Water's performance against this clause.</p> <p>Auditor should refer to the following recommendations relevant to this clause (see Table 3):</p> <ul style="list-style-type: none"> – 2018-01 – 2018-02 <p>The system must be in place and implemented from the commencement of the licence. Evidence must demonstrate that a compliant system was in place for the whole period for compliance.</p>
2.1.3	Sydney Water must notify IPART and NSW Health, in accordance with the Reporting Manual, of any significant changes that it proposes to make to the Drinking Water Quality Management System.	SC	We will contact NSW Health to comment on Sydney Water's performance against this clause.
2.1.4	Sydney Water must obtain NSW Health's approval for any significant changes that it proposes to make to the Drinking Water Quality Management System before implementing, or carrying out its activities in accordance with, such changes.	SC	We will contact NSW Health to comment on Sydney Water's performance against this clause.

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
2.1.5	<p>By 31 December 2016, Sydney Water must:</p> <ul style="list-style-type: none"> a) in consultation with its Customer Council and NSW Health, complete a review of its public reporting on water quality. The review must address (at a minimum) the frequency of Sydney Water's public reporting and the key parameters reported on water quality; and b) provide IPART with a report detailing the outcomes of the review referred to in clause 2.1.5(a). 	NR	

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
2.2	Recycled water		
2.2.1	<p>Sydney Water must maintain a Management System that is consistent with the Australian Guidelines for Water Recycling, except to the extent that NSW Health specifies otherwise (the Recycled Water Quality Management System).</p> <p><i>[Note: It is expected that the Recycled Water Quality Management System will be consistent with the Australian Guidelines for Water Recycling, including the Framework for Management of Recycled Water Quality and Use. However, where NSW Health considers it appropriate, the application of the Australian Guidelines for Water Recycling may be amended or added to, to take account of Sydney Water's circumstances and/or Recycled Water quality policy and practices within New South Wales.]</i></p>	Audit	<p>We last audited this clause in 2018. We assigned a Compliant grade.</p> <p>We will contact NSW Health to comment on Sydney Water's performance against this clause.</p> <p>Deviations from the Australian Guidelines for Water Recycling should be in accordance with pre-approved requirements of clause 2.2.4.</p>
2.2.2	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	<p>We last audited this clause in 2018. We assigned a Compliant Minor Shortcomings grade.</p> <p>We will contact NSW Health to comment on Sydney Water's performance against this clause.</p> <p>Auditor should refer to the following recommendations relevant to this clause (see Table 3):</p> <ul style="list-style-type: none"> – 2016-17-5 (part b) – 2016-17-6 (parts a, b and c) – 2018-03 – 2018-04 <p>The system must be in place and implemented from the commencement of the licence.</p> <p>Evidence must demonstrate that a compliant system was in place for the whole period to award full compliance.</p>
2.2.3	Sydney Water must notify IPART and NSW Health, in accordance with the Reporting Manual, of any significant changes that it proposes to make to the Recycled Water Quality Management System.	SC	We will contact NSW Health to comment on Sydney Water's performance against this clause.
2.2.4	Sydney Water must obtain NSW Health's approval for any significant changes that it proposes to make to the Recycled Water Quality Management System before implementing, or carrying out its activities in accordance with, such changes.	SC	We will contact NSW Health to comment on Sydney Water's performance against this clause.

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
2.3	Fluoridation code		
2.3.1	Sydney Water must comply with the Fluoridation Code.	SC	We will contact NSW Health to comment on Sydney Water's performance against this clause.
3	Water Quantity		
3.1	Roles and Responsibilities Protocol		
3.1.1	Sydney Water must use its best endeavours to: <ul style="list-style-type: none"> a) develop and agree a Roles and Responsibilities Protocol with the Metropolitan Water Directorate for the development and implementation of the Metropolitan Water Plan; and b) maintain and comply with the Roles and Responsibilities Protocol that has been developed and agreed under clause 3.1.1(a). 	NR	In 2018, the Department of Planning and Environment (DPE) advised that the protocol is no longer required and this was confirmed by audit. We note the functions of the Metropolitan Water Directorate now sit with DPE. DPE will be replaced by the Department of Planning, Industry and Environment from 1 July 2019.
3.2	Economic level of water conservation		
3.2.1	By 1 November 2015, Sydney Water must submit to IPART (for IPART's approval) a report outlining Sydney Water's approach to, and principles for, developing a methodology for determining its economic level of water conservation, including (at a minimum) each of the following elements of water conservation: <ul style="list-style-type: none"> a) water leakage; b) water recycling; and c) water efficiency (including demand management) 	NR	
3.2.2	Once the approach and principles referred to in clause 3.2.1 are approved by IPART, Sydney Water must develop a methodology (Methodology) in accordance with the approach and principles.	NR	
3.2.3	By 31 December 2016, Sydney Water must obtain IPART's approval for the Methodology.	NR	
3.2.4	Once the Methodology is approved by IPART, Sydney Water must, from the date that such approval is given: <ul style="list-style-type: none"> a) notify IPART, in accordance with the Reporting Manual, of any significant changes that it proposes to make to the Methodology; and b) obtain IPART's written consent to make any significant changes to the Methodology prior to making such changes. 	SC	

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
3.2.5	<p>Until Sydney Water has developed and obtained IPART's approval for the Methodology (in accordance with clauses 3.2.2 and 3.2.3), Sydney Water must:</p> <ul style="list-style-type: none"> a) maintain the weather corrected quantity of Drinking Water that it draws from all sources to a level of water usage equal to, or less than, 329 litres per person per day (the Water Usage Level). In calculating water usage for the purpose of the Water Usage Level, Sydney Water may make reasonable adjustments to account for the effects of weather on water usage, using a methodology approved by IPART; b) ensure that the level of water leakage from its Drinking Water supply system (the Water Leakage Level) does not exceed 121 megalitres per day; and c) promote, foster and encourage the efficient use of water and the production and use of Recycled Water, where financially viable. 	NR	
3.2.6	<p>By 1 September 2017, Sydney Water must develop a water conservation program consistent with its economic level of water conservation and in accordance with the methodology approved by IPART under clause 3.2.3.</p> <p><i>[Note: The water conservation program will be outlined in the first Water Conservation Report, which is to be submitted to IPART by 1 September 2017 in accordance with clause 3.2.1 of the Reporting Manual.]</i></p>	NR	
3.2.7	Sydney Water must report to IPART, in accordance with the Reporting Manual, on water conservation.	SC	
4	Assets		
4.1	Asset Management System		
4.1.1	By 30 June 2018, Sydney Water must develop a Management System that is consistent with the International Standard ISO 55001:2014 Asset Management System - Requirements (the Asset Management System).	NR	
4.1.2	<p>Sydney Water must ensure that:</p> <ul style="list-style-type: none"> a) by 30 June 2019, the Asset Management System is certified by an appropriately qualified person to be consistent with the International Standard ISO 55001:2014 Asset Management System – Requirements; and b) once the Asset Management System is certified, the certification is maintained during the remaining term of this Licence. 	Audit	We reviewed this clause in the 2018 audit. The auditor was of the opinion that Sydney Water made sufficient progress to have its AMS certified in time to meet the 30 June 2019 deadline.

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
4.1.3	Once the Asset Management System has been certified in accordance with clause 4.1.2(a), Sydney Water must notify IPART, in accordance with the Reporting Manual, of any significant changes that it proposes to make to the Asset Management System.	SC	
4.1.4	By 30 June 2019, 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	This is the first audit of this clause in this licence period. Auditor to check that the AMS is fully implemented.
4.1.5	<p>Until the Asset Management System has been developed in accordance with clause 4.1.1, certified in accordance with clause 4.1.2(a) and implemented in accordance with clause 4.1.4:</p> <ul style="list-style-type: none"> a) Sydney Water must continue to maintain and implement the asset management framework that was required to be maintained and implemented by Sydney Water under the licence that was the immediate predecessor to this Licence (the Asset Management Framework), b) to avoid doubt, until the Asset Management System has been developed in accordance with clause 4.1.1, Sydney Water may only make changes to the Asset Management Framework that will assist in the transition of the Asset Management Framework to the Asset Management System; and c) Sydney Water must notify IPART, in accordance with the Reporting Manual, of any significant changes that it proposes to make to the Asset Management Framework. 	Audit	<p>We last audited this clause in 2018. We assigned a Compliant grade.</p> <p>Until the system is certified the Asset Management Framework must continue to be implemented.</p>

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
4.2	System Performance Standards		
4.2.1	Water Pressure Standard	SC	
	<ul style="list-style-type: none"> a) Sydney Water must ensure that, in any financial year, no more than 6,000 Properties experience a Water Pressure Failure (the Water Pressure Standard). b) A Property is taken to have experienced a Water Pressure Failure: <ul style="list-style-type: none"> i) when 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 ii) when Sydney Water identifies that the Property has experienced a Water Pressure Failure (including through its data collection systems and hydraulic analysis). c) Despite clause 4.2.1(b), a Property will not be taken to have experienced a Water Pressure Failure if that Water Pressure Failure occurred only because of: <ul style="list-style-type: none"> i) water usage in the case of a fire or other abnormal demand; or ii) a short term or temporary operational problem (such as a main break) which is remedied within Four days of its commencement. d) For the purpose of the Water Pressure Standard: <ul style="list-style-type: none"> i) 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.] ii) each Property that experiences one or more Water Pressure Failures in a financial year is to be counted once only in that financial year 		

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
4.2.2	<p>Water Continuity Standard</p> <p>a) Sydney Water must ensure that, in any financial year:</p> <p>i) no more than 40,000 Properties experience an Unplanned Water Interruption that lasts for more than five continuous hours; and</p> <p>ii) no more than 14,000 Properties experience three or more Unplanned Water Interruptions that each lasts for more than one hour (the Water Continuity Standard).</p> <p>b) 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 and the duration of the Unplanned Water Interruption.</p> <p>c) 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 purpose of clause 4.2.2(a).</p> <p>d) For the purpose of the Water Continuity Standard:</p> <p>i) each separately billed part of a Multiple Occupancy Property is to be counted as a separate Property;</p> <p>ii) for the purpose of clause 4.2.2(a)(i) each separate instance, in a financial year, of a single Property experiencing an Unplanned Water Interruption that lasts for more than five continuous hours is to be counted as a separate Property that has experienced, in that financial year, an Unplanned Water Interruption that lasts for more than five continuous hours; and</p> <p>iii) for the purpose of clause 4.2.2(a)(ii), each Property that experiences, in a financial year, three or more Unplanned Water Interruptions that each lasts for more than one hour is to be counted once only in that financial year.</p>	Audit	<p>Sydney Water informed IPART that it is likely to breach its Water Continuity Standard the 2018-19 financial year.</p> <p>Auditor to investigate the causes of the breach and the adequacy of response for the exceedance. The findings under clause 4.1.2 maybe relevant to this clause.</p>

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
4.2.3	<p>Wastewater Overflow Standard</p> <p>a) Sydney Water must ensure that, in any financial year:</p> <p>i) no more than 14,000 Properties (other than Public Properties) experience an Uncontrolled Wastewater Overflow in dry weather; and</p> <p>ii) no more than 175 Properties (other than Public Properties) experience three or more Uncontrolled Wastewater Overflows in dry weather (the Wastewater Overflow Standard).</p> <p>b) For the purpose of the Wastewater Overflow Standard:</p> <p>i) each Multiple Occupancy Property is to be counted as a single Property; <i>[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.]</i></p> <p>ii) for the purpose of clause 4.2.3(a)(i), each separate instance, in a financial year, of a single Property experiencing an Uncontrolled Wastewater Overflow in dry weather is to be counted as a separate Property that has experienced, in that financial year, an Uncontrolled Wastewater Overflow in dry weather; and</p> <p>iii) for the purpose of clause 4.2.3(a)(ii), each Property that experiences three or more Uncontrolled Wastewater Overflows in a financial year is to be counted once only in that financial year.</p>	SC	
4.2.4	<p>Interpretation of standards</p> <p>In the case of any ambiguity in the interpretation or application of any System Performance Standard, IPART's interpretation or assessment of the application of the System Performance Standard will prevail.</p>	NR	
4.3	Response time for water main breaks		
4.3.1	Sydney Water must report, in accordance with the Reporting Manual, on response times for water main breaks and leaks.	SC	
4.4	Priority Sewerage Program		
4.4.1	Sydney Water must co-operate with, and participate in, any Government review of the Priority Sewerage Program.	SC	
4.4.2	If required by the Minister, Sydney Water must implement and comply with any outcomes (including timeframes) of a Government review of the Priority Sewerage Program.	SC	

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
5	Customer and Consumers		
5.1	Customer Contract		
5.1.1	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.	NR	
5.1.2	Sydney Water must make a copy of the Customer Contract available to any person, free of charge: <ul style="list-style-type: none"> a) on its website for downloading; and b) upon request made to the Contact Centre. 	SC	
5.2	Providing information		
5.2.1	Sydney Water must prepare a pamphlet that: <ul style="list-style-type: none"> a) provides a brief explanation of the Customer Contract; b) summarises the key rights and obligations of Customers under the Customer Contract; c) refers to the types of account relief available for Customers experiencing financial hardship; d) outlines the rights of Customers to claim a rebate and the conditions that apply to those rights; e) contains information regarding how to contact Sydney Water by telephone, email or post; and f) contains information regarding the ability for a Customer to enter into agreements with Sydney Water (separate to the Customer Contract) for the provision by Sydney Water of Services to the Customer. 	SC	
5.2.2	Sydney Water must update the pamphlet prepared under clause 5.2.1 to reflect any variations made to the Customer Contract.	SC	
5.2.3	Sydney Water must: <ul style="list-style-type: none"> a) provide the pamphlet prepared under clause 5.2.1 and pamphlet updates made under clause 5.2.2, free of charge to: <ul style="list-style-type: none"> i) Customers at least annually with their Bills; and ii) any person upon request made to the Contact Centre; and b) make the pamphlet prepared under clause 5.2.1 and pamphlet updates made under clause 5.2.2 available on its website for downloading by any person, free of charge, within 60 days of the commencement of the Customer Contract or pamphlet update as the case may be. 	SC	

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
5.2.4	<p>Sydney Water must advertise in a Sydney-based newspaper at least annually on:</p> <ul style="list-style-type: none"> a) the types of account relief available for Customers experiencing financial hardship; and b) rights of Customers to claim rebates and the conditions that apply to those rights. 	Audit	We last audited this clause in 2017. We assigned a "Full Compliance" grade (under the previous audit grades).
5.3	Consumers		
5.3.1	Sydney Water's obligations under the Customer Contract relating to Complaint handling and Complaint resolution procedures are extended to Consumers as if Consumers were parties to the Customer Contract.	SC	
5.4	Assistance Options for Payment Difficulties and Actions for Non-Payment		
5.4.1	<p>Sydney Water must maintain and fully implement:</p> <ul style="list-style-type: none"> a) a financial hardship policy that assists residential Customers experiencing financial hardship 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 financial hardship; 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 financial hardship, (the <i>Assistance Options for Payment Difficulties and Actions for Non-Payment</i>). 	SC	
5.4.2	<p>Sydney Water must set out, in the Customer Contract:</p> <ul style="list-style-type: none"> a) the Assistance Options for Payment Difficulties and Actions for Non-Payment; and b) the options under the Assistance Options for Payment Difficulties and Actions for Non-Payment that are available to Private Residential Tenants who pay usage charges to Sydney Water. 	SC	

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
5.4.3	<p>Sydney Water must provide, free of charge, an explanation of the Assistance Options for Payment Difficulties and Actions for Non-Payment to:</p> <ul style="list-style-type: none"> a) residential Customers, at least annually with their Bills; b) residential Customers who Sydney Water identifies as experiencing financial hardship on the date that Sydney Water first identifies that the Customer is experiencing financial hardship; and c) any other person upon request made to the Contact Centre. 	Audit	We last audited this clause in 2017. We assigned a "Full Compliance" grade (under the previous audit grades).
5.4.4	Sydney Water must make the explanation of the Assistance Options for Payment Difficulties and Actions for Non-Payment referred to in clause 5.4.3 available on its website for downloading by any person, free of charge.	SC	
5.5	Customer Council and Customer Council Charter		
5.5.1	Sydney Water must maintain and regularly consult with organisations representing a broad cross section of its Customers and Consumers through the Customer Council.	SC	
5.5.2	Sydney Water must utilise the Customer Council to, among other things, obtain advice on the interests of Sydney Water's Customers and Consumers, the Customer Contract and such other key issues related to Sydney Water's planning and operations as Sydney Water may determine, consistent with the Customer Council Charter (referred to in clause 5.5.4).	SC	

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
5.5.3	<p>Sydney Water must:</p> <ul style="list-style-type: none"> a) ensure that, at all times, the membership of the Customer Council is appointed and determined by Sydney Water in accordance with the Customer Council Charter, and b) use its best endeavours to include, as members of the Customer Council, at least one person representing each of the following categories: <ul style="list-style-type: none"> i) business groups, including small, medium and large business and non-residential customers; ii) consumer groups; iii) organisations representing low income households; iv) people living in rural and urban fringe areas; v) residential consumers; vi) environmental groups; vii) local government; viii) older people; ix) people with disabilities; x) indigenous Australians; and xi) people from non-English speaking backgrounds. 	SC	

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
5.5.4	<p>Sydney Water and members of the Customer Council must, for the term of this Licence, maintain a charter (the Customer Council Charter) that addresses all of the following issues:</p> <ul style="list-style-type: none"> a) the role of the Customer Council; b) selection criteria on how members of the Customer Council will be drawn from the community and information on how vacancies for membership will be advertised; c) the processes for appointment of new members; d) the term for which members are appointed; e) information on how the Customer Council will operate; f) a description of the type of matters that will be referred to the Customer Council and how those matters will be referred; g) procedures for the conduct of Customer Council meetings, including the appointment of a chairperson and the requirement to invite, on an annual basis, a co-chair of the Customer Council from Customer representatives; h) procedures for communicating the outcomes of the Customer Council's work to the public; i) procedures for monitoring issues raised at meetings of the Customer Council and ensuring appropriate follow-up of those issues; and j) funding and resourcing of the Customer Council by Sydney Water. 	SC	
5.5.5	Sydney Water must provide the Customer Council with information in Sydney Water's possession or under its control necessary to enable the Customer Council to discharge the tasks assigned to it, other than information or documents that are confidential (including documents that are subject to client legal privilege).	SC	
5.5.6	<p>Sydney Water must make a copy of the Customer Council Charter and minutes from proceedings of the Customer Council, available to any person, free of charge:</p> <ul style="list-style-type: none"> a) on its website for downloading; and b) upon request made to the Contact Centre. 	SC	
5.5.7	Sydney Water and the Customer Council may each propose any amendments to the Customer Council Charter. However, such amendments will not be effective until they have been approved by both Sydney Water and the Customer Council.	NR	

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
5.6	Internal complaints handling		
5.6.1	Sydney Water must maintain a procedure for receiving, responding to and resolving Complaints, which is consistent with the Australian Standard AS/NZS 10002:2014 – Guidelines for complaint handling in organisations (AS/NZS 10002:2014) (the Internal Complaints Handling Procedure).	Audit	We last audited this clause in 2016. We assigned a “Full Compliance” grade (under the previous audit grades).
5.6.2	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	Audit	We last audited this clause in 2016. We assigned a “Full Compliance” grade (under the previous audit grades).
5.6.3	Sydney Water must provide to Customers, at least annually with their Bills, information concerning internal complaints handling, which explains how to make a Complaint and how Sydney Water will receive, respond to and resolve Complaints.	SC	
5.6.4	Sydney Water must make the information concerning internal complaints handling referred to in clause 5.6.3 available to any person, free of charge: <ul style="list-style-type: none"> a) on its website for downloading; and b) upon request made to the Contact Centre 	SC	
5.7	External dispute resolution scheme		
5.7.1	Sydney Water must be a member of the Energy and Water Ombudsman NSW to facilitate the resolution, by a dispute resolution body, of disputes between Sydney Water and its Customers and Consumers.	SC	
5.7.2	Sydney Water must: <ul style="list-style-type: none"> a) prepare a pamphlet that explains the operation of the dispute resolution service provided by the Energy and Water Ombudsman NSW, including any right to have a Complaint or dispute referred to the Energy and Water Ombudsman NSW and how such a Complaint or dispute can be assessed; b) provide a copy of the pamphlet prepared under clause 5.7.2(a), free of charge to Customers at least once a year with their Bills; and c) make a copy of the pamphlet prepared under clause 5.7.2(a) available to any person, free of charge: <ul style="list-style-type: none"> i) on its website for downloading; and ii) upon request made to the Contact Centre. 	SC	
5.8	Code of conduct		
	Sydney Water must use its best endeavours to co-operate with each Licensed Network Operator and Licensed Retail Supplier within the Area of Operations that seeks to establish with Sydney Water a code of conduct of the kind referred to in clause 25 of the WIC Regulation.	SC	

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
6	Environment		
6.1	Environment management		
6.1.1	Sydney Water must maintain a Management System certified to Australian Standard AS/NZS ISO 14001:2004: Environmental Management Systems – Requirements with guidance for use (the Environmental Management System).	SC	
6.1.2	Sydney Water must fully implement, and carry out all relevant activities in accordance with, the Environmental Management System.	SC	
6.1.3	Sydney Water must notify IPART, in accordance with the Reporting Manual, of any significant changes that it proposes to make to the Environmental Management System.	SC	
6.1.4	Sydney Water must provide IPART, in accordance with the Reporting Manual, with a report on the outputs of the Environmental Management System.	SC	
6.2	Environmental indicators		
6.2.1	<p>Sydney Water must:</p> <ul style="list-style-type: none"> a) prepare indicators of the direct impact on the environment of Sydney Water's activities (the Environmental Performance Indicators); b) monitor and compile data on the Environmental Performance Indicators; and c) report on the Environmental Performance Indicators in accordance with the Reporting Manual. 	Audit	We last audited this clause in 2016. We assigned a "Full Compliance" grade (under the previous audit grades).
7	Quality Management		
7.1	Quality Management System		
7.1.1	By 30 June 2017, Sydney Water must develop a Management System that is consistent with the <i>Australian Standard AS/NZS ISO 9001:2008: Quality Management Systems - Requirements</i> (the Quality Management System).	SC	
7.1.2	<p>Sydney Water must ensure that:</p> <ul style="list-style-type: none"> a) by 30 June 2018, the Quality Management System is certified by an appropriately qualified person to be consistent with the <i>Australian Standard AS/NZS ISO 9001:2008: Quality Management Systems – Requirements</i>; and b) once the Quality Management System is certified under clause 7.1.2(a), the certification is maintained during the remaining term of this Licence. 	SC	
7.1.3	By 30 June 2018, Sydney Water must ensure that the Quality Management System is fully implemented and that all relevant activities are carried out in accordance with the Quality Management System.	SC	

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
7.1.4	Sydney Water must notify IPART, in accordance with the Reporting Manual, of any significant changes that it proposes to make to the Quality Management System.	SC	
8	Performance monitoring		
8.1	Operational audits		
8.1.1	IPART may undertake, or may appoint an Auditor to undertake, an audit of Sydney Water's compliance with any of the following: this Licence; the Reporting Manual; and any matters required by the Minister; (the Operational Audit).	NR	
8.1.2	Sydney Water must, within a reasonable time period of a receiving a request from IPART or an Auditor to provide information, provide IPART or the Auditor with all the information in Sydney Water's possession, or under Sydney Water's custody or control, which is necessary to conduct the Operational Audit, including any information that is reasonably requested by IPART or an Auditor.	NR	
8.1.3	For the purpose of any Operational Audit or verifying a report on an Operational Audit, Sydney Water must, within a reasonable time period of receiving a request from IPART or an Auditor, permit IPART or the Auditor to: <ul style="list-style-type: none"> 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 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. 	NR	

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
8.2	Reporting		
8.2.1	Sydney Water must comply with its reporting obligations set out in the Reporting Manual, which include: <ul style="list-style-type: none"> a) reporting to IPART and NSW Health in accordance with the Reporting Manual; b) making reports and other information publicly available, in the manner set out in the Reporting Manual; and c) reporting to IPART on Sydney Water's performance against the National Water Initiative Performance Indicators. 	SC	We will contact NSW Health to comment on Sydney Water's performance against this clause.
8.2.2	Sydney Water must maintain sufficient record systems that enable it to report accurately in accordance with clause 8.2.1.	SC	
8.3	Provision of information		
8.3.1	Sydney Water must provide IPART with information relating to the performance of any of Sydney Water's obligations under clause 8.2 (including providing IPART with physical and electronic access to the records required to be kept under clause 8.2) within a reasonable time period of Sydney Water's receiving a request from IPART for that information	SC	
8.3.2	Sydney Water must provide IPART with 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 period of Sydney Water's receiving a request from IPART for that information.	SC	
8.3.3	If Sydney Water contracts out any of its activities to any person (including a subsidiary) it must take all reasonable steps to ensure that, if required by IPART or an Auditor, any such persons provide information and do the things specified in clause 8.1 as if that person were Sydney Water.	SC	
8.3.4	If IPART or an Auditor requests information under clause 8 which 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	
8.3.5	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 period of receiving NSW Health's request. <i>[Note: Under section 19 of the Public Health Act 2010 (NSW), the Director General of the NSW Ministry of Health may require Sydney Water to produce certain information.]</i>	SC	We will contact NSW Health to comment on Sydney Water's performance against this clause.

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
8.4	Performance indicators and system performance standards		
8.4.1	Sydney Water must maintain record systems that are sufficient (to IPART's satisfaction) to enable Sydney Water to measure accurately its performance against the performance indicators and System Performance Standards specified in the Reporting Manual.	SC	
8.4.2	In the case of any ambiguity in the interpretation or application of any performance indicators specified in the Reporting Manual, IPART's interpretation or assessment of the application of the indicators will prevail.	NR	
9	Memorandum of understanding		
9.1	NSW Health		
9.1.1	Sydney Water must maintain the memorandum of understanding with NSW Health entered into under section 35 of the Act.	SC	We will contact NSW Health to comment on Sydney Water's performance against this clause.
9.1.2	The purpose of the memorandum of understanding referred to in clause 9.1.1 is to form the basis for co-operative relationships between the parties to the memorandum of understanding. In particular, the purpose of the memorandum of understanding referred to in clause 9.1.1 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.	NR	
9.1.3	The memorandum of understanding referred to in clause 9.1.1 must include arrangements for Sydney Water to report to NSW Health information on any events in relation to Sydney Water's systems or Services, which may pose a risk to public health.	SC	We will contact NSW Health to comment on Sydney Water's performance against this clause.
9.2	Environment Protection Authority		
9.2.1	Sydney Water must maintain the memorandum of understanding with the Environment Protection Authority entered into under section 35 of the Act.	SC	We will contact the Environment Protection Authority (EPA) to comment on Sydney Water's performance against this clause
9.2.2	The purpose of the memorandum of understanding referred to in clause 9.2.1 is to form the basis for co-operative relationships between the parties to the memorandum of understanding. In particular, the purpose of the memorandum of understanding referred to in clause 9.2.1 is to recognise the role of the Environment Protection Authority as the environment regulator of New South Wales and to commit Sydney Water to environmental obligations.	NR	
9.3	Water Administration Ministerial Corporation		
9.3.1	Sydney Water must maintain the memorandum of understanding with the Water Administration Ministerial Corporation (WAMC) entered into under section 35 of the Act.	SC	We will contact WAMC to comment on Sydney Water's performance against this clause

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
9.3.2	The purpose of the memorandum of understanding referred to in clause 9.3.1 is to form the basis for co-operative relationships between the parties to the memorandum of understanding. In particular, the purpose of the memorandum of understanding referred to in clause 9.3.1 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.	NR	
9.4	Fire and Rescue NSW		
9.4.1	Sydney Water must use its best endeavours to develop and enter into a memorandum of understanding with Fire and Rescue NSW (FRNSW) by 31 December 2015.	NR	
9.4.2	Once the memorandum of understanding referred to in clause 9.4.1 is developed and entered into, Sydney Water must use its best endeavours to comply with the memorandum of understanding.	Audit	We will contact Fire and Rescue NSW to comment on Sydney Water's performance against this clause.
9.4.3	<p>The purpose of the memorandum of understanding referred to in clause 9.4.1 is to form the basis for co-operative relationships between the parties to the memorandum of understanding. In particular, the purpose of the memorandum of understanding referred to in clause 9.4.1 is to:</p> <ul style="list-style-type: none"> a) develop the roles and responsibilities of the parties to the memorandum of understanding as they relate to each other; b) identify the needs and constraints of the parties to the memorandum of understanding 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 to the memorandum of understanding. 	NR	

Licence clause	Operating Licence obligation	2019 audit requirement	Comments for the auditor
9.4.4	<p>The memorandum of understanding referred to in clause 9.4.1 must require:</p> <ul style="list-style-type: none"> a) the establishment of a working group, comprised of representatives from Sydney Water and FRNSW; and b) the working group to consider the following matters (at a minimum): <ul style="list-style-type: none"> i) arrangements regarding information sharing 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 parties to the memorandum of understanding. <p><i>[Note: Clauses 9.1.1, 9.2.1, 9.3.1 and 9.4.1 do not limit the persons with whom Sydney Water may be a party to a memorandum of understanding.]</i></p>	SC	
10	End of Term Review		
10.1	End of Term Review		
10.1.1	<p>It is anticipated that a review of this Licence will commence in the first quarter of 2019 to investigate:</p> <ul style="list-style-type: none"> a) whether this Licence is fulfilling its objectives; and b) any issues which have arisen during the term of this Licence, which may affect the effectiveness of this Licence; (the End of Term Review). 	NR	
10.1.2	<p>Sydney Water must provide the person undertaking the End of Term Review with such information as is reasonably required to enable the person to undertake the End of Term Review. Sydney Water must provide that person with such information as the person requests within a reasonable time period of receiving that request.</p>	Audit	This is the first audit of this clause in this licence period.

Source: Sydney Water Corporation five year audit program.

Table 3 Recommendations / outstanding items from previous audits

Recommendation number	Operational issue (licence reference where applicable)	IPART's recommendation to the Minister	2018 audit findings, and status as reported by utility on 29 March 2019 ^a	Guidance for 2019 audit
2016-17-5	Water quality (recycled water): clause 2.2.2	By 30 June 2018: b) in consultation with NSW Health, review the preventive measures for end user sites (on-site preventive measures) as documented in the recycled water management system and supporting material, including the content of the Annual Declaration and compliance inspection checklist, to ensure they are appropriate to the level of risk.	<p>Continuing (parts (a) and (c) were closed out in the 2018 audit).</p> <p>Our auditor noted that the iterative consultation with NSW Health has not been completed; that revised materials should be finalised within 12 months; and status should be reviewed at the 2019 operational audit.</p> <p>Sydney Water has reviewed the preventive measures on end user sites. Supporting revised end user controls, statutory declarations and inspection checklists were provided to NSW Health, and iterative revisions are being reviewed and updated. Sydney Water expects to close this out by 30 June. Sydney Water's 31 March progress report notes that Sydney Water consulted with NSW Health regarding the end user preventative measures and supporting material in 2018. NSW Health provided feedback on the proposed materials and preventative measures and this feedback has been incorporated. Sydney Water recently sought confirmation from NSW Health that they are comfortable with the final revised end user preventative measures.</p> <p>Sydney Water is also in the process of updating its Recycled Water Quality Management Plans (RWQMPs) to reflect these revised end user controls. Once feedback is received from NSW Health, existing recycled water agreements will be amended to reference the revised scheme types, revised end user preventative measures and revised annual declaration forms. The revised compliance inspection checklists have been finalised.</p>	<p>Auditor to check completeness.</p> <p>IPART to contact NSW Health to comment on Sydney Water's performance against this clause.</p>

2016-17-6	Water quality (recycled water): clause 2.2.2	<p>By 30 June 2019:</p> <ul style="list-style-type: none"> a) ensure Sydney Water staff and contractors who are responsible for verifying the onsite preventive measures are trained and assessed as competent to implement their responsibilities b) establish and implement a process for on-going competency assessment, and c) review all end user sites to confirm end users are meeting their obligations under their end user agreement or the Recycled Water Quality Management Plan and implement the interruption to supply process where appropriate. 	<p>Continuing</p> <p>Our auditor noted that Sydney Water provided an update for progressing this recommendation that is due to be completed by 30 June 2019. As all Business Customer Representatives who manage interactions with recycled water business customers hold a Diploma in Water Industry Operations, Sydney Water considered that staff have the appropriate competencies to effectively manage the role.</p> <p>Sydney Water is implementing additional learning opportunities for employees and contractors whose duties involve recycled water management.</p> <p>Sydney Water considers it has closed out parts (a) and (b) of this recommendation (see below). Sydney Water's 31 March progress report notes the following:</p> <p><u>Clause 2.2.2(a):</u></p> <p>Sydney Water has reviewed the role and associated skills of staff verifying on-site controls in relation to recycled water management and shared this approach with NSW Health in the document titled "Operational Audit 2016-2017 water quality recommendations – proposed approach for discussion".</p> <p>Sydney Water relies on its recycled water business customers to implement any required customer controls. Sydney Water confirms the implementation of customer controls through the use of annual customer declarations.</p> <p>Sydney Water's Business Customer Representatives are responsible for interacting directly with its recycled water business customers. The extent of verification of the customer controls performed by Sydney Water is limited to the Business Customer Representatives examining the annual customer statutory declarations.</p>	Auditor to check completeness.
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Business Customer Representative Position Descriptions require the incumbent to obtain a Certificate IV or Diploma in Water Industry Operations. Sydney Water considers that this qualification (or equivalent) comprises appropriate units of competency for the role with reference to the Australian Qualifications Framework.

Consequently, Sydney Water considers that staff have the appropriate competencies to effectively manage the role. Additionally Sydney Water's Business Customer Representatives managing its recycled water business customers have recently completed a three-day IWES (International Water & Environmental School) course, "Recycled Water Management"

Clause 2.2.2(b):

Sydney Water will use the existing Contribution and Development Plan (CDP) process for the ongoing evaluation of competency for Business Customer Representatives that are managing recycled water business customers. This competency assessment will be based on the Business Customer Representative's enrolment or successful completion of a Certificate IV or Diploma in Water Industry Operations (or equivalent). The CDP framework will be used to track the successful enrolment and completion of the required training.

Clause 2.2.2(c):

As discussed under its response to recommendation 2017-18-05, Sydney Water will soon amend end user recycled water agreements and confirm that end users are meeting their obligations prior to 30 June 2019 through the use of the revised statutory declarations. Where required, the interruption to supply process will be implemented.

2018-01	Water quality (drinking water): clause 2.1.2	By 30 June 2019, ensure reservoir roofs, in particular the Parklea drinking water reservoir, have been inspected safely as per the reservoirs inspection schedule, including with the required safety equipment and associated training.	<p>Continuing</p> <p>Sydney Water considers it is on track to complete this recommendation by the due date. From its 31 March progress report:</p> <p>Sydney Water is currently reviewing this program. Inspection staff have been recertified for working at heights and have the required and appropriate safety equipment. Inspection schedule is being reviewed.</p>	Auditor to check completeness.
2018-02	Water quality (drinking water): clause 2.1.2	By 30 June 2019, have processes in place to document target finish dates, priorities, revised dates and reasons for delay in implementing improvement actions on drinking water.	<p>Continuing</p> <p>Sydney Water considers it has closed out this recommendation by the 30 June due date. From its 31 March progress report:</p> <p>The Water Quality Improvement plans have been updated to ensure that target finish dates, priorities, revised dates and any reasons for delay are recorded. Sydney Water discussed how we manage changes to the program at the Joint Operations Group meeting with NSW Health in February 2019.</p>	Auditor to check completeness.
2018-03	Water quality (recycled water): clause 2.2.2	By 31 March 2019, test all main to meter pipes to prevent cross-connections prior to the supply of recycled water from Sydney Water's main to any properties within Sydney Water's dual reticulation schemes and establish a hold point prior to supply of recycled water.	<p>Continuing</p> <p>Sydney Water considers it has closed out this recommendation by the 31 March due date. Sydney Water notes, in the 31 March progress report, that initial action has been completed with a hold about this approach in February 2019, and ongoing actions will be managed through the water quality improvement plan. point in place to check every property. The process will continue to be reviewed with the aim of simplifying and improving ongoing assurance. Sydney Water has informed the Joint Operations Group with NSW Health about this approach in February 2019, and ongoing actions will be managed through the water quality improvement plan.</p>	Auditor to check completeness.

2018-04	Water quality (recycled water): clause 2.2.2	By 30 June 2019, have processes in place to document target finish dates, priorities, revised dates and reasons for delay in implementing improvement actions on recycled water product and recycled water schemes.	<p>Continuing</p> <p>Sydney Water considers it has closed out this recommendation by the 30 June due date. The 31 March progress report notes the Water Quality Improvement plans have been updated to ensure that target finish dates, priorities, revised dates and any reasons for delay are recorded. Sydney Water discussed how it manages changes to the program at the Joint Operations Group Meeting with NSW Health in February 2019.</p>	Auditor to check completeness.
2018-05	Customers and consumers: clause 5.2.1	By 30 June 2019, update the pamphlet prepared under clause 5.2.1 to include or refer to information regarding the ability for a customer to enter into agreements with Sydney Water (separate to the Customer Contract) for the provision by Sydney Water of services to the customer.	<p>Continuing</p> <p>Sydney Water considers it in on track to close out this recommendation by the 30 June due date. The 31 March progress report notes the Customer Programs team have started the process of identifying what needs to be changed in the 'contract in brief' to respond to the identified requirements (the 'contract in brief' refers to the 'Our Contract with You' pamphlet that goes out in customer bills with the August – October edition of the Waterwrap newsletter each year). Changes to the contract in brief will be completed by the end of June 2019, ready for printing and supply to the bill print suppliers. The contract in brief will then be distributed in bills with the August - October (2019) period Waterwrap.</p> <p>The contract in brief will reference clause 2.3 of the Customer Contract – <i>"Other agreements with us"</i>. The contract in brief will state that "if you have a separate agreement with us (for example, in relation to trade waste, sewer mining, stormwater harvesting, recycled water or an additional services agreement), the terms of that agreement will take precedence over the terms of this contract, to the extent of any inconsistency between them".</p>	Auditor to check completeness.

2018-06	Performance monitoring: clause 8.4.1	By 30 June 2019, review data extraction processes for reporting against the Wastewater Overflow Standard to ensure an improvement in the reporting of the actual number of events.
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Source: IPART, *Report to Minister - Sydney Water Operational Audit 2018*, December 2018

a Sydney Water Corporation 31 March Report, submitted 29 March 2019.

Continuing

Sydney Water considers it is on track to close out this recommendation by the 30 June due date. From its 31 March progress report, it notes that data extraction processes are being reviewed and action is on track to be completed by 30 June 2019.

Auditor to check completeness.

Table 4 Field verification locations for Sydney Water Corporation

Audit year	Location	Facility
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
	Preston	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

D Operational audit report 2019 – Sydney Water

2019 Public Water Utility Audit

Sydney Water Corporation

November 2019

CobbittyConsulting
Engineering and Advisory Services



2019 Public Water Utility Audit

Sydney Water Corporation

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Document History and Status

Revision	Date	Authors	Reviewed by	Approved by	Details
0.1	7 Oct 2019	James Howey Tasleem Hasan Jim Sly	Tasleem Hasan Mark Favetta	James Howey	First draft following the onsite interviews and inspections. Some additional information is still required to clarify some items.
0.2	9 Nov 2019	James Howey Tasleem Hasan Jim Sly	Tasleem Hasan Mark Favetta Sydney Water IPART	James Howey	Revised draft incorporating comments from IPART and Sydney Water on the draft report. Additional evidence also supplied.
1.0	22 Nov 2019	Jim Sly James Howey	Sydney Water IPART James Howey Jim Sly Tasleem Hasan	James Howey	Final report incorporating comments from IPART and Sydney Water on the revised draft report.

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Executive Summary

Summary of Compliance with Sydney Water's Operating Licence 2015-2020

The auditors in general were pleased with Sydney Water Corporation's (Sydney Water) level of compliance. Throughout the audit, staff were forthcoming with information and showed a high level of dedication and knowledge of processes and systems. This was apparent across all Sydney Water teams and also with the contractor operating the Woronora Water Filtration Plant (WFP).

The audit only identified one non-compliance. There was a non-material non-compliance for the number of properties that experienced an unplanned water interruption, that lasted for more than five continuous hours. This was not a systematic failure, but was predominately due to one significant event, a critical water main break in Punchbowl that accounted for 45% of the Licence limit.

There were four compliant clauses that had minor-shortcomings, which were considered to not impact upon public health or the environment. These were mostly minor system and process issues that could be considered as part of continued improvement. There were also a number of opportunities for improvement identified, which the auditors considered would help the ongoing improvement of systems and process, in addition to the recommendations.

Auditor Declaration

Viridis Consultants Pty Ltd has been engaged by the Independent Pricing and Regulatory Tribunal of NSW (IPART) to undertake an operational audit of Sydney Water Corporation's *Operating Licence 2015-2020* for the period of 1 July 2018 to 30 June 2019. The audit was undertaken in partnership with Cobbitty Consulting Pty Ltd.

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 – July 2019* and IPART's *Request for Quote*
- the audit findings have not been unduly influenced by the utility and/or any of its associates.

Findings and Recommendations

The auditors assessed Sydney Water's compliance for 17 clauses from its Operating Licence. There were 12 clauses that were fully Compliant, four clauses that were Compliant (minor shortcomings) and one clause that was Non-Compliant (Non-Material).

The audit interviews and site visits were undertaken from the 9th to 11th September 2019. During the site visit the following locations were inspected:

- Oak Flats Re-chlorination Plant
- Wollongong Water Recycling Plan (WRP)
- Helensburgh Reservoir
- Woronora WFP

Findings and recommendations from the audit are summarised in the table below.

Clause	Grade and Major Findings	Risk: public health, environmental, customer relations, operations or financial	Recommendations
1.8.1	Compliant Sydney Water demonstrated that the Licence is available on its website for downloading, and that it has arrangements in place to provide copies upon request to its contact centre. There are no charges levied in either case.	n/a	n/a
1.9.1	Compliant Sydney Water demonstrated that it had set the level of fees, charges, and other amounts payable for its Services during the audit in accordance with the relevant IPART Determination. Sydney Water also demonstrated that it has an extensive portfolio of procedures in place to ensure that prices are correctly calculated and applied.	n/a	n/a
2.1.1	Compliant (minor shortcomings) Sydney Water is maintaining a Drinking Water Quality Management System (DWQMS) that is overall consistent with the Australian Drinking Water Guidelines, except for one component within element 4. There is no documented procedure for the evaluation of the chlorine solution used in the networks and for the associated supplier(s).	Shortcomings were identified as being minor and there were no risks to water quality, public health and safety.	REC-SWC-2019-01: By 30 June 2020, establish documented procedures for evaluating the chlorine solution used in networks maintenance activities and for evaluating associated supplier(s).

Clause	Grade and Major Findings	Risk: public health, environmental, customer relations, operations or financial	Recommendations
2.1.2	<p>Compliant (minor shortcomings)</p> <p>Sydney Water is implementing its DWQMS overall, except for some activities under elements 4 and 10.</p> <p>Portable Turbidimeters were not calibrated at the frequency stated in the related work instruction. The monthly key performance indicator (KPI) reporting on cross-connection inspections was not undertaken as per the <i>Drinking Water Product Specifications</i> (IMS0152.01).</p>	<p>It is considered that these shortcomings are minor. The calibration records show that calibration was being undertaken, though not routinely at the stated frequency. However, verification testing is also undertaken by NATA accredited labs for turbidity in the drinking water supplied, providing a backup to the results obtained using the HACH 2100 Portable Turbidimeter. This provides assurance for the portable turbidimeter test results and quality of drinking water supplied. Overall Sydney Water is undertaking KPI reporting for other performance indicators as per the <i>Drinking Water Product Specifications</i>. Sydney Water indicated that it engages with NSW Health on its cross-connection programs and will review the <i>Drinking Water Products Specifications</i> (IMS0152.01) to ensure the cross-connection reporting target is undertaken.</p>	<p>REC-SWC-2019-02: By 30 June 2020, ensure calibration records associated with the work instruction, <i>HACH 2100 Series Portable Turbidimeter - Calibration and Maintenance</i>, are appropriately maintained to demonstrate that the required calibrations are undertaken at the specified frequency as per the work instruction.</p> <p>REC-SWC-2019-03: By 30 June 2020, ensure internal KPI reporting outlined in the <i>Drinking Water Product Specifications</i> (IMS0152.01) is undertaken as required. A review of the target criteria for cross-connection management in the <i>Drinking Water Product Specifications</i> (IMS0152.01) is to be undertaken to ensure that new and established residential property cross-connection rates are at a level that prevents unacceptable exposure (nominally 1/1000 houses). Appropriate monitoring of the targets must be established. This review must be undertaken in consultation with NSW Health.</p>

Clause	Grade and Major Findings	Risk: public health, environmental, customer relations, operations or financial	Recommendations
2.2.1	<p>Compliant (minor shortcomings)</p> <p>It was considered the risk assessments for the Wollongong Schemes were too high-level to meaningfully manage the risk. However, the supporting documentation, such as monitoring and operational procedures were very detailed. The site visit also supported the fact that on the ground risks are well managed. The risk assessment is due to be reviewed in 2020</p> <p>It was considered that monitoring of current cross-connection controls could be improved. After the initial plumbing inspection for new properties, inspections are reactive to customer complaints. It is recommended in the Australian Guidelines for Water Recycling that audits of residential properties are undertaken to determine if controls, to prevent cross-connections, are working. It was considered that Sydney Water should investigate the effectiveness of their controls, as currently this is only determined through the number of complaints.</p>	<p>It was considered that the shortcomings did not affect water quality, public health or the environment. In relation to the risk assessment, operational documentation was good and the Wollongong schemes provide water for industry and irrigation, which are not high risk uses. For cross-connections, the issue was identified in relation to the monitoring of controls.</p>	<p>REC-SWC-2019-04: The recycled water risk assessments need to be more detailed to ensure that they manage risk effectively. The following actions are to be undertaken</p> <ul style="list-style-type: none"> • All possible modes of failure are to be assessed through the identification of hazards and hazardous events, although these may be grouped. • Specific actions or procedures are identified as preventive measures to ensure the measure is understood, communicated and auditable. • Significant risks should be clearly identified, to ensure preventive measures are in place and prioritised accordingly. • Areas of uncertainty are to be identified to ensure that there is continual improvement in the risk assessment process. <p>These are to be implemented for the next revision of the Wollongong Stages 1 and 2 risk assessments prior to 31 March 2020.</p> <p>Also, refer to REC-SWC-2019-03 for the recommendation covering the cross-connection monitoring issue raised in this clause.</p>
2.2.2	<p>Compliant</p> <p>On examination of Sydney Water's implementation of their Recycled Water Management System it was considered that sufficient evidence had been provided to demonstrate that the activities required had been fully carried out.</p>	n/a	n/a
4.1.2	<p>Compliant</p> <p>Sydney Water demonstrated that its Asset Management System was certified as being compliant with the requirements of ISO 55001:2014 effective from 12 June 2019. As no further assessment of ongoing compliance was undertaken by the independent certifier during the audit period, it is deemed that certification was maintained.</p>	n/a	n/a

Clause	Grade and Major Findings	Risk: public health, environmental, customer relations, operations or financial	Recommendations
4.1.4	Compliant As part of the process of certifying Sydney Water's Asset Management System as being compliant with the requirements of ISO 55001:2014, the independent auditor/certifier assessed that the Asset Management System was being implemented as part of the certification audit undertaken in respect of Sydney Water's Asset Management System,	n/a	n/a
4.1.5	Compliant Sydney Water has continued to implement sound asset management practices consistent with the arrangements detailed in the Asset Management Framework.	n/a	n/a
4.2.2	Non-compliant (non-material) Sydney Water declared non-compliance with this obligation. The number of properties that experienced an Unplanned Water Interruption that lasted for more than five continuous hours exceeded the Licence limit by more the 25%; the most significant contributing event accounted for 45% of the limit.	Failure to comply with this requirement presents a possible risk to public health, due to a loss of water supply, and customer relations due to a failure to maintain an adequate level of service.	REC-SWC-2019-05: It is recommended that Sydney Water completes a formal debrief (including a root cause analysis) in respect of the Punchbowl water main break with a view to identifying and developing more effective monitoring arrangements that enable timely identification of operational conditions that may affect its performance against the Water Continuity Standard. Such formal debrief should be completed by 31 March 2020.
5.2.4	Compliant Sydney Water demonstrated, by providing tear sheets from three newspapers, that it had placed an advertisement outlining options in respect of service rebates and financial assistance options in more than one Sydney-based newspaper and a further newspaper covering part of its area of operations during the audit period. Accordingly, Sydney Water is assessed to have demonstrated compliance with this obligation.	n/a	n/a

Clause	Grade and Major Findings	Risk: public health, environmental, customer relations, operations or financial	Recommendations
5.4.3	Compliant Sydney Water demonstrated that it is proactive in providing an explanation of the assistance options available for customers having difficulty in paying their bills, with information available via each of the requisite mechanisms. Information is similarly available, but not so readily apparent, in respect of actions that will be taken for non-payment of bills.	n/a	n/a
5.6.1	Compliant Sydney Water demonstrated, by provision of an Assessment Report prepared by the Customer Services Institute of Australia (CSIA), that its Internal Complaints Handling Procedure (complaint handling process) was recertified as being consistent with AS/NZS 10002:2014 in June 2017. Subsequent revisions to the procedure have either enhanced the process or been made to ensure that the procedure remains reflective of Sydney Water's overall business approach.	n/a	n/a
5.6.2	Compliant Sydney Water demonstrated that it continued to implement its complaint procedure throughout the audit period. Review of a sample of complaint records revealed that they had been effectively managed, whilst performance statistics indicate that some 5,952 complaints were resolved during the audit period. Sydney Water also demonstrated that relevant staff have undertaken training in respect of the complaint management process. An internal audit of the process identified the need for some improvement; however, this is considered to be reflective of ongoing improvement and not a failure to implement the procedure.	n/a	n/a

Clause	Grade and Major Findings	Risk: public health, environmental, customer relations, operations or financial	Recommendations
6.2.1	Compliant (minor shortcomings) The shortcoming is because the energy data reported in indicators E1 and E2 do not include figures from assets operated by contractors.	There is potential for impacts to customer relations and the environment. Omission of data from assets operated by contractors could result in these not being included in future energy strategies and regulation. It may also lead to reduced public confidence.	REC-SWC-2019-06: By 30 June 2020 Sydney Water is to amend its reporting of indicators E1 and E2 to include energy consumption and renewable electricity generation by build own operate transfer (BOOT) contractors.
9.4.2	Compliant Sydney Water demonstrated that through its involvement as members of the Strategic Leadership Group and the Fire Firefighting Working Group established under the Memorandum of Understanding, and the program of work being undertaken in support of the stated objectives (purposes), it has used its best endeavours to comply with the Memorandum of Understanding during the audit period. This assessment is supported by comments made by Fire and Rescue NSW.	n/a	n/a
10.1.2	Compliant Sydney Water demonstrated it had provided IPART with such information as was reasonably required to undertake the End of Term Review (it provided a response to all requests) and in most cases had complied with the requested timeline. Where the requested timeline could not be achieved, Sydney Water had notified and agreed alternative timing with IPART.	n/a	n/a

1. Introduction

1.1. Objectives

The objective of this audit was to conduct an operational audit of Sydney Water Corporation's (Sydney Water's) performance against specified clauses of its *Operating Licence 2015-2020* and any ministerial requirements for the period from 1 July 2018 to 30 June 2019.

1.2. Audit Method

1.2.1. Audit Scope

The audit scope was determined by the Independent Pricing and Regulatory Tribunal (IPART) using a risk-based approach to identify the *Operating Licence 2015-2020* clauses to be audited during the 2018/19 audit period. The clauses within the scope of this audit period are identified in Table 1. Sydney Water was required to provide a Statement of Compliance for the licence clauses that were not audited.

Stakeholder submissions were received from Fire & Rescue NSW, Environmental Protection Authority and NSW Health. The following recommendations were made by these stakeholders in relation to the audit scope:

- NSW Health recommended that the audit consider potential risks related to backflow and connection/cross connection of drinking water services. Also, the audit should consider how the operation of build own operate transfer (BOOT) plants is addressed in the drinking water quality management system (DWQMS), including critical control points (CCPs), alarms and supervisory control and data acquisition (SCADA).
- The Environment Protection Authority wanted to bring attention to significant regulatory action brought against Sydney Water during the audit period, mainly in relation to the response to dry weather sewage overflows, which was found to be inadequate on a number of occasions.
- Fire & Rescue NSW requested consideration to be made in regard to the efficient and effective provision of firefighting water. Greater understanding of the water network would be beneficial to Fire & Rescue NSW and details of flow and pressure from all fire hydrants is sought.

Outstanding items/recommendations from previous audits were also reviewed and the status of the required actions determined.

Table 1 Audit Scope

Licence Part	Clause/Obligation	Type of Audit	IPART's comments made prior to audit commencing
Availability of Licence	1.8.1	Audit	This is the first audit of this clause in this licence period.
Pricing	1.9.1	Audit	We last audited this clause in 2018. We assigned a "Non-Compliant Non-Material" grade. Sydney Water was also non-compliant in 2015 (previous licence), 2016 and 2017.
Drinking Water	2.1.1	Audit	We last audited this clause in 2018. We assigned a "Compliant" grade. We will contact NSW Health to comment on Sydney Water's performance against this clause. Drinking water is the highest risk aspect of this utility's operations. The system must be consistent with the Australian Drinking Water Guidelines (ADWG) except to the extent that NSW Health specifies (specification from NSW Health must be consistent with the requirements of clause 2.1.4 below).

Licence Part	Clause/Obligation	Type of Audit	IPART's comments made prior to audit commencing
Drinking Water	2.1.2.	Audit	<p>We last audited this clause in 2018. We assigned a "Compliant Minor Shortcomings" grade.</p> <p>We will contact NSW Health to comment on Sydney Water's performance against this clause.</p> <p>Auditor should refer to the following recommendations relevant to this clause (see Table 3):</p> <ul style="list-style-type: none"> • 2018-01 • 2018-02 <p>The system must be in place and implemented from the commencement of the licence. Evidence must demonstrate that a compliant system was in place for the whole period for compliance.</p>
Recycled Water	2.2.1	Audit	<p>We last audited this clause in 2018. We assigned a "Compliant" grade.</p> <p>We will contact NSW Health to comment on Sydney Water's performance against this clause.</p> <p>Deviations from the Australian Guidelines for Water Recycling (AGWR) should be in accordance with pre-approved requirements of clause 2.2.4.</p>
	2.2.2	Audit	<p>We last audited this clause in 2018. We assigned a "Compliant Minor Shortcomings" grade.</p> <p>We will contact NSW Health to comment on Sydney Water's performance against this clause.</p> <p>Auditor should refer to the following recommendations relevant to this clause (see Table 3):</p> <ul style="list-style-type: none"> • 2016-17-5 (part b) • 2016-17-6 (parts a, b and c) • 2018-03 • 2018-04 <p>The system must be in place and implemented from the commencement of the licence.</p> <p>Evidence must demonstrate that a compliant system was in place for the whole period to award full compliance.</p>
Asset Management System	4.1.2	Audit	We reviewed this clause in the 2018 audit. The auditor was of the opinion that Sydney Water made sufficient progress to have its Asset Management System (AMS) certified in time to meet the 30 June 2019 deadline.
	4.1.4	Audit	This is the first audit of this clause in this licence period. Auditor to check that the AMS is fully implemented.
	4.1.5	Audit	<p>We last audited this clause in 2018. We assigned a "Compliant" grade.</p> <p>Until the system is certified the Asset Management Framework must continue to be implemented.</p>
System Performance Standards	4.2.2	Audit	<p>Sydney Water informed IPART that it is likely to breach its Water Continuity Standard the 2018-19 financial year.</p> <p>Auditor to investigate the causes of the breach and the adequacy of response for the exceedance. The findings under clause 4.1.2 maybe relevant to this clause</p>
Pricing Information	5.2.4	Audit	We last audited this clause in 2017. We assigned a "Full Compliance" grade (under the previous audit grades).
Assistance Options for Payment Difficulties and Actions for Non-Payment	5.4.3	Audit	We last audited this clause in 2017. We assigned a "Full Compliance" grade (under the previous audit grades).
Internal complaints handling	5.6.1; 5.6.2	Audit	We last audited this clause in 2017. We assigned a "Full Compliance" grade (under the previous audit grades).

Licence Part	Clause/Obligation	Type of Audit	IPART's comments made prior to audit commencing
Environmental Indicators	6.2.1	Audit	We last audited this clause in 2016. We assigned a "Full Compliance" grade (under the previous audit grades).
Memorandum of understanding - Fire and Rescue NSW	9.4.2	Audit	We will contact Fire & Rescue NSW to comment on Sydney Water's performance against this clause.
End of Term Review	10.1.2	Audit	This is the first audit of this clause in this licence period.
Recommendations/Outstanding Items from Previous Audits			
2016/17-5	2.2.2-Water Quality Recycled Water	Audit	Auditor to check completeness. IPART to contact NSW Health to comment on Sydney Water's performance against this clause.
2016/17-6	2.2.2-Water Quality Recycled Water	Audit	Auditor to check completeness.
2018-1	Water quality (drinking water): clause 2.1.2	Audit	Auditor to check completeness.
2018-2	Water quality (drinking water): clause 2.1.2	Audit	Auditor to check completeness.
2018-3	Water quality (recycled water): clause 2.2.2	Audit	Auditor to check completeness.
2018-4	Water quality (recycled water): clause 2.2.2	Audit	Auditor to check completeness.
2018-5	Customers and consumers: clause 5.2.1	Audit	Auditor to check completeness.
2018-6	Performance monitoring: clause 8.4.1	Audit	Auditor to check completeness.

1.2.2. Audit Standard

The IPART *Audit Guideline - Public Water Utilities – July 2019* (Audit Guideline) formed the standard for the Operational Audit. *ISO 19011 Guidelines for Auditing Management Systems* was also relied upon to ensure good audit practice.

1.2.3. Audit Steps

The audit steps are identified in the Audit Guideline and are reproduced in Table 2.

Table 2 Audit steps

Step	Description	Responsibility
1	Audit scoping	IPART
2	Appointment of auditor	IPART
3	Audit preparation	Auditor/Utility/IPART
4	Audit interview	Auditor/Utility
5	Field verification site visits	Auditor/Utility
6	Wrap up and close out meetings	Auditor/Utility
7	Assessing and reporting	Auditor/Utility/IPART
8	Reporting to Minister	IPART
9	Reporting on recommendations	Utility

The audit included three days of staff interviews and site inspections. The timetable and sites visited were as follows:

- 9 September 2019 – staff interviews
- 10 September 2019 – site inspections:
 - Oak Flats Re-chlorination Plant
 - Wollongong Water Recycling Plant (WRP)
 - Helensburgh Reservoir
 - Woronora Water Filtration Plant (WFP)
- 11 September 2019 – staff interviews

1.2.4. Sampling

The audit used sampling to focus the assessment to evidence that delivered the scope of the audit. Site specific evidence was limited to the sites visited during the field inspections, which are detailed in section 1.2.3.

1.2.5. Audit Team

The audit team was co-led by James Howey from Viridis Consultants Pty Ltd (Viridis) and Jim Sly from Cobbitty Consulting Pty Ltd (Cobbitty). Roles for each team member are detailed in Table 3.

Table 3 Audit team details

Team member	Organisation	Certifications	Role
James Howey	Viridis	Lead Water Quality Management Systems Auditor – Drinking and Recycled Water (Exemplar Global) Associate Environment Management Systems Auditor (Exemplar Global) Technical Services and Water Licencing Audit Panel: Drinking Water Quality Recycled Water Quality	Project Manager Lead Auditor – Water Quality, Environment
Tasleem Hasan	Viridis	Lead Water Quality Management Systems Auditor – Drinking Water (Exemplar Global) Technical Services and Water Licencing Audit Panel: Drinking Water Quality	Audit Support – Water Quality, Environment
Jim Sly	Cobbitty	Technical Services and Water Licencing Audit Panel: infrastructure performance retail supply	Lead Auditor – Assets, Performance, NWI Indicators
Mark Favetta	Cobbitty	Technical Services and Water Licencing Audit Panel: infrastructure performance retail supply environment and catchment management	Audit Support – Assets, Performance

Sydney Water staff and contractors as well as IPART, attended the interviews and site verification visits. Details of audit participation are shown in Table 4.

Table 4 Audit participants

First Name	Last Name	Position	Organisation	Participation
Greg	Alford	Service Delivery Officer Lvl6	Sydney Water	Auditee
Kate	Beatty	Senior Analyst	Sydney Water	Auditee
Ben	Blayney	Product Manager	Sydney Water	Auditee
Edward	Braithwaite	Asset Strategist	Sydney Water	Auditee
Dierdre	Burt	Monitor Design & Reporting Specialist Lead	Sydney Water	Auditee
Darren	Cash	Customer Hub Manager	Sydney Water	Auditee
Amit	Chaudhary	Analyst	Sydney Water	Auditee
Karen	Chia	Water Supply Manager	Sydney Water	Auditee

First Name	Last Name	Position	Organisation	Participation
Jignesh	Chudasama	Compliance Analyst	Sydney Water	Auditee
Paul	Cousins	Operations Supervisor	Veolia	Auditee
Mark	Crabtree	Service Planning Manager	Sydney Water	Auditee
Steve	Cramer	Manager Billing & Revenue	Sydney Water	Auditee
Craig	Crawley	Service Planning Manager	Sydney Water	Auditee
Philip	Davies	Head of Regulatory Economics	Sydney Water	Auditee
Paul	Dixon	Operations Manager	Veolia	Auditee
Corinna	Doolan	Customer Water Quality Manager	Sydney Water	Auditee
Michael	English	Competition and Licensing Manager	Sydney Water	Auditee
Mark	Favetta	Consultant	Cobbitty	Auditor
Hugo	Figgis	Process Controller – Wollongong WRP	Sydney Water	Auditee
Tony	Filacourdis	Head of Safety and Wellbeing	Sydney Water	Auditee
Paul	Fleming	Production Officer	Sydney Water	Auditee
Kieran	Frigo	System Delivery Officer	Sydney Water	Auditee
Caleb	Furner	Manager Business Customers	Sydney Water	Auditee
Patrick	Gallagher	Head of Risk	Sydney Water	Auditee
Gus	Garbers	Business & Reg Compliance Specialist	Sydney Water	Auditee
Tasleem	Hasan	Consultant	Viridis	Auditor
Paul	Higham	GM Liveable City Solutions	Sydney Water	Auditee
Howard	Hilton	Senior Production officer	Sydney Water	Auditee
David	Holland	Networks Programs Manager	Sydney Water	Auditee
Kathy	Hourigan	Head of Customer Services	Sydney Water	Auditee
James	Howey	Director	Viridis	Lead Auditor
Mirek	Januszek	SCADA Services Manager	Sydney Water	Auditee
Andrzej	Krawiec	Senior Networks Operations Engineer	Sydney Water	Auditee
Gavin	Landers	Water Agreement Manager	Sydney Water	Auditee
Marjorie	Lim-Cerretto	Pricing and Non Residential Specialist	Sydney Water	Auditee
Eric	Lindberg	Senior Business Analyst Tech Pricing & Compliance	Sydney Water	Auditee
Nicole	McCarthy	Manager – Contact Centre	Sydney Water	Auditee






First Name	Last Name	Position	Organisation	Participation
Raema	Melverton	Head of Communications & Government Relations	Sydney Water	Auditee
James	Milton	Technical Specialist	Sydney Water	Auditee
Stella	Modyanto	Process Engineer	Sydney Water	Auditee
ASM	Mohiuddin	Process Manager	Sydney Water	Auditee
Heidi	Muras	Senior Analyst – Competition and Regulation	Sydney Water	Auditee
Peter	Nedelkovski	Senior Compliance Analyst	Sydney Water	Auditee
Nicola	Nelson	Manager Science Research & Innovation	Sydney Water	Auditee
Catherine	Ng	Contract Officer	Sydney Water	Auditee
Giang	Nguyen	Senior Specialist - Integrated Management System	Sydney Water	Auditee
Chris	Owens	Service Planning Senior Analyst	Sydney Water	Auditee
Vedah	Panuccio	Team Manager Customer Care	Sydney Water	Auditee
Andrew	Peters	Water Quality Scientist	Sydney Water	Auditee
Teresa	Quinlan	Environmental Scientist	Sydney Water	Auditee
Nathan	Ragel	EMS Project Officer	Sydney Water	Auditee
Castor	Rajanayagam	Wastewater Technical Manager	Sydney Water	Auditee
Mark	Ramage	Illawarra Hub Production Manager	Sydney Water	Auditee
Rebecca	Reid	Reporting and Regulatory Manager, Customer Programs	Sydney Water	Auditee
Jeff	Scott	Production Manger Chemical Dosing	Sydney Water	Auditee
Kris	Selvakumar	Service Delivery Officer Lvl6	Sydney Water	Auditee
Sunita	Singh	Senior Risk & Assurance Partner	Sydney Water	Auditee
Sathy	Sivasubramaniam	Performance Insights Leader	Sydney Water	Auditee
Jim	Sly	Director	Cobbitty	Lead Auditor
Sandra	Spargo	Corporate Compliance Manager	Sydney Water	Auditee
Greg	Stavely	Manager – Business Customers	Sydney Water	Auditee
Craig	Taylor	Illawarra Hub Reliability Engineer	Sydney Water	Auditee
Fiona	Thompson	Communications Business Partner	Sydney Water	Auditee
Mike	Wassell	Manager – Hydraulic System Services	Sydney Water	Auditee

First Name	Last Name	Position	Organisation	Participation
Shaohua	Ye	Analyst	Sydney Water	Auditee
David	Zhang	Strategist	Sydney Water	Auditee

1.2.6. Audit Grades

Compliance grades are identified in the Audit Guidelines and are reproduced in Table 5

Table 5 Compliance Grades

Grade of compliance	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.

1.3. Regulatory Regime

Sydney Water is a State-Owned Corporation, wholly owned by the NSW State Government. Sydney Water's principle functions are to provide water, sewerage and stormwater services and dispose of wastewater in its area of operations.

These roles and responsibilities, as well as Sydney Water's objectives, are prescribed by the *State Owned Corporations Act 1989* (NSW), the *Sydney Water Act 1994* (NSW) (the Act) and the current operating licence (*Operating Licence 2015-2020*) issued to Sydney Water under Part 5, section 12 of the Act.

1.4. Quality Assurance Process

This audit was carried out in accordance with the Viridis Quality Manual, which is accredited under ISO 9001:2015. The audit team leader James Howey was the Project Manager for the audit and responsible for ensuring the quality of the deliverables. Quality assurance activities undertaken during the audit comprised of:

- compliance with the Viridis Quality Manual
- internal peer review of the report by a suitably qualified Lead Auditor
- document control and approval processes.

2. Detailed Audit Findings

2.1. Site Visit Report

2.1.1. Oak Flats Re-chlorination Plant

The Oak Flats Re-chlorination Plant is a recently constructed automatic batch dosing sodium hypochlorite re-chlorination plant, which has been in operational service for approximately 12 months. It is located within the same property and adjacent to the Oak Flats Reservoir. On the basis of visual inspection, the plant appeared to be in good condition and the site well maintained. This is to be expected as the plant is relatively new.

The plant can be monitored and controlled locally or remotely via Integrated Instrumentation, Control, Automation and Telemetry System (IICATS) (Sydney Water's SCADA system).

Sydney Water staff are responsible for operation and minor maintenance of the facility. Work orders for the site are generated by MAXIMO. Field staff advised that they have recently begun to use a new Field Mobility Platform, referred to as "Click", which is used to schedule operators' routine tasks and record completion. According to Sydney Water it has enabled some minor productivity improvements. A site maintenance diary is maintained and a *Rechlorination Report* is prepared 6 days a week, Monday to Friday and Sunday. It was noted that Sydney Water staff attend the site for all chemical deliveries.

Mechanical and electrical maintenance is undertaken under contract by Ventia in accordance with maintenance schedule prescribed by Sydney Water. Ventia manages its own maintenance program to complete the scheduled activities.

Water quality preventive measures, procedures and multiple barriers were being implemented in line with the DWQMS. The auditors did not observe any issue which may affect public health, water quality or safety.

The chlorine target maintained at the site is between 0.8-0.9 mg/L, in order to achieve greater than 0.2 mg/L of free chlorine at the customers' tap. Chlorine concentration is measured online on the outlet of the reservoir.

A brief inspection of the adjacent reservoir, an in-ground concrete lined storage with metal deck roofing, revealed that the roof was well sealed and access hatch securely fixed (pop rivetted shut). A vent panel was observed to be partially dislodged and its surface corroded; this is in need of repair to ensure that foreign bodies (including birds or vermin) are prevented from entering the reservoir.

2.1.2. Wollongong Water Recycling Plant

Wollongong WRP provides tertiary level treatment of wastewater. The recycled water produced is reused for dust suppression at the Port Kembla coal terminal, steel manufacturing at BlueScope Steel and irrigation of the Wollongong Golf Club. The remainder is discharged via an ocean outfall. Methane from the digesters is captured and used to generate electricity and biosolids are also reused.

The site inspection was undertaken in three separate streams, a process review and plant inspection, asset system review and an inspection of SCADA, plant records and the laboratory.

Secondary treatment is split into two streams, one of which has Biological Nutrient Removal (BNR), effluent from the BNR stream is higher quality than the other and is used for both Stage 1 & 2 recycling. The following points were noted during the site inspection:

- Ferrous chloride is dosed for phosphorus removal, chemical dosing is not shown on the Recycled Water Quality Management Plan (RWQMP) flow charts (discussed in section 2.2.4, clause 2.2.1).

- Ammonia is currently monitored using a weekly composite sample. The chlorine demand post the Deep Bed Filters is used as a surrogate for direct ammonia monitoring. A total ammonia probe would be useful to control the BNR process (discussed in section 2.2.4, clause 2.2.2)
- Deep bed filters are mono media (sand) and no coagulant is dosed. This may account for the *Cryptosporidium* that passes through and is discussed in section 2.2.4, clause 2.2.2.

The CCP limits were verified between SCADA and the RWQMPs and found to be consistent. The free chlorine CCP was tested by simulating an exceedance of the critical limit. The pump to the customer was shutdown, as per the RWQMP. Calibration records for monitoring instruments and a number of Standard Operating Procedures (SOPs) were sighted.

Maintenance within one of the primary sedimentation tanks (TNK3100) was being undertaken during the audit, to replace chains and scrapers, reseal joints and allow a structural assessment to be conducted. Staff were able to demonstrate, using their AMS, that the maintenance was a scheduled major preventative maintenance and that maintenance of the two other sedimentation tanks had been recently completed. Following the route associated with this asset (preventative maintenance plan PM 10065860), Sydney Water was able to present the work order associated with this asset.

It was noted that the housing of the analyser panels 1 & 2 was subject to surficial corrosion, which was likely as result of the types of chemicals being stored. Whilst this presents a low risk, it was unclear whether the structural parts of the housing had been checked. The AMS had not recorded this corrosion, or any associated checks; furthermore, there did not appear to be any maintenance or inspections of this asset planned. Sydney Water did, however, confirm that they implement a structural review program with a typical review cycle of 5-years that would be expected to identify and assess this issue.

A check of operational monitoring showed that there was some ammonia data omitted from the records, which was stated as being due to a restructure of the hub (operational region) causing a temporary shortage of Production Officers, which led to the tests not being undertaken. The issue was identified by Sydney Water and has been rectified. The ammonia data is used to support operational decision making.

Implementation of some improvement actions from the *Recycled Water Product Improvement Plan* were discussed. In October 2018, three new conductivity meters were installed at head of plant, and in January 2019, a project was undertaken on enhancement of the System Operations Centre (SOC) alarms for the reverse osmosis units. The auditors identified some opportunities for improvement (OFI):

- restrict access for operators to prevent the ability to change CCP critical limit values or establish a process of approval for any CCP limit changes in SCADA
- incorporate a time-out function for the simulation mode (locks an online instrument to a particular value), in case the user overlooks to turn off the simulation mode.

The review of maintenance management was undertaken by reviewing Sydney Water's Maximo CMMS (computerised maintenance management system). The "Click" scheduling tool was also briefly reviewed. Mechanical and electrical maintenance is undertaken under contract by Ventia in accordance with maintenance schedule prescribed by Sydney Water. Ventia is managed through Sydney Water's Maximo system; however, has its own 'Click' type system which it uses to manage its maintenance program.

The site visit confirmed that preventive measures, procedures and multiple barriers were being implemented by Sydney Water in line with its RWQMPs. The auditors did not observe any issue which may affect public health, water quality and safety. Also, it was apparent that assets and maintenance activities at the treatment plant are well managed.

2.1.3. Helensburgh Reservoir

The Helensburgh Reservoir comprises two storage reservoirs (WS0348 and WS0048) that have storage capacities of 10 ML and 2 ML respectively. The tanks are generally operated in parallel and turn over

approximately 4-5 ML/day. It is a common inlet/outlet reservoir with a mixer inside the reservoir to prevent stagnation (alarms on SCADA for faults).

It was noted that the reservoir is located within bushland that likely poses a significant bushfire risk. Apart from the reservoir site itself being cleared of vegetation, no other protective measures were in place.

Sydney Water advised that both tanks are manually dosed with chlorine tablets. Tablets are placed into a dispersion basket from roof level. A mixer ensures distribution throughout the water body. Staff have to carry the tablets on top of the reservoir and place them in tubes (with holes), which are lowered into the water. Quality assurance tests are performed on the tablets to verify quality. Formsite (internet-based form building and sharing service) is used to record reservoir inspections and the quantity of chlorine tablets added. The form also provides the user details of the number of required tablets based on the current chlorine concentration.

The tank walls were in generally good condition with some patch painting evident. There was some surface corrosion around the inlet/outlet fittings, it did not appear to be such as to compromise integrity at this stage. Sydney Water advised that the stairway, which provides access to the roof, is not compliant with current code requirements; however, it remains functional.

The roof of the tank appeared to be generally well maintained, however, there was some surficial corrosion and flaking of paint on the perimeter walkway, which was generally minor in nature. The roof ridges were adequately sealed, preventing vermin from entering the reservoir. The central ventilation unit was fitted with grills with sufficiently small aperture.

An inspection at the access hatch, where dosing was performed, indicated that there was some chemical corrosion. Sydney Water later advised that a project to rectify and prevent this from occurring has been initiated and is currently underway. Sydney Water undertake external inspections 6-monthly and internal inspections 5-yearly. Inspection records which were subsequently provided. These are discussed in section 2.2.5 (clause 4.1.5).

The Helensburgh Reservoir (WS0348) internal wall is bitumen lined and Sydney Water has a program of removing and replacing this coating with a contemporary epoxy coating.

The site visit confirmed that preventive measures, procedures and multiple barriers were being implemented by Sydney Water in line with its DWQMS. The auditors did not observe any issue which may affect public health, water quality and safety.

2.1.4. Woronora Water Filtration Plant

The Woronora WFP is owned and operated by Veolia under a BOOT contractual arrangement with Sydney Water. Inspection of the facility was undertaken in three parts, with one stream focussed on the treatment plant (water quality and assets) and a second stream inspecting the Woronora raw water pumping station and Helensburgh treated water pumping station (assets) and a third looking at SCADA, records and the laboratory.

The auditors walked through the filtration plant, from raw water inlet to final treated water. The currency of the treatment process against the process flow diagram (PFD) was verified and found to be current. It was noted during the review of the treatment process that the supernatant return is flow controlled based on the balance and back washing requirements and not restricted to 10%, which is considered by many to be the maximum safe return rate. This is discussed in section 2.2.3, clause 2.1.2.

The quality of raw water is generally good hence the last jar testing was undertaken in 2016. It was mentioned that jar testing will be undertaken as required. However, it was noted that Sydney Water's drought response strategy may lead to some configuration changes at the Woronora WFP to manage different water qualities entering the plant (raw water may be supplied by back-feeding from Prospect

Reservoir). Veolia has begun investigating and planning for potential configuration changes, demonstrating their commitment to asset management planning.

SCADA is being upgraded by Veolia with some additional features (e.g. *C.t* calculation will be seen on the SCADA page), this is a positive improvement. It was noted that the SCADA upgrade was only partially commissioned during the audit period. The CCP limits were verified between SCADA and the Woronora DWQMP and found to be consistent. However, the backup SCADA had a slight inconsistency, which was more conservative in terms of alarm time delay (this has been discussed further under section 2.2.3, clause 2.1.2). The CCP for filtered water turbidity (Filter 7) was tested by simulating an exceedance of the High High SCADA limit. The filter shut down, as per the DWQMP.

The site visit confirmed that preventive measures, procedures and multiple barriers were being implemented by Sydney Water and Veolia in line with the DWQMS and Woronora DWQMP respectively. The auditors did not observe any issue which may affect public health, water quality and safety.

Veolia provided a short overview of its Veolia Asset Management System (VAMS). The asset register is maintained within VAMS, which is also used for maintenance management. Planned/preventative maintenance is undertaken in accordance with an established plan, schedules being pre-planned and associated works orders issued. Identification of the need for corrective or breakdown maintenance results in a work order being generated in VAMS so that the work can be allocated and completed.

The plant operators have Water Industry Operators Association of Australia (WIOA) certificates, an example was sighted onsite.

Veolia undertakes an annual condition assessment of the asset portfolio. Condition is rated on a 1-5 scale, and the grading used to support decision making such reviewing/adjusting the planned replacement timeline taking into account the asset 'exposure', i.e. criticality. Criticality, which reflects factors such as redundant capacity, is rated low, moderate, high or extreme. Based on the limited sample of assets inspected onsite they appeared to be in good condition.

Refurbishment/replacement of assets is deemed to constitute capital maintenance, which is managed in accordance with CARMS, Veolia's Contact Asset Renewal System. Under Veolia's Boot contract arrangement they are responsible for capital expenditure decision making.

2.1.5. Customer Hub

The customer Hub was inspected by the asset audit team. Sydney Water implemented its Customer Hub to the full operations area in September 2018. The Customer Hub is a product of Sydney Water's operating model implementation.

According to Sydney Water, the Customer Hub has improved service reliability and service experience for customers, using improved information and analytic capability to better coordinate resources and make on-the-job decisions. It is allowing Sydney Water to manage service faults end-to-end and better inform customers of service status. Furthermore, Sydney Water's '*Digital Enablement*' is building and improving the analytics, insights, mobility and monitoring capability that supports the Customer Hub and provide customer service insights to the organisation and the service planning processes.

The Customer Hub operates between 6:00am and 11:30pm each day, with calls outside these hours patched directly to field staff. Approximately 600 calls (on average) are directed to the Customer Hub each day. Approximately 300 work orders are generated from these calls.

The Customer Hub enables customers to report faults through a variety of channels, including: telephone, email, social media, the Sydney Water website and the Sydney Water mobile phone app (which allows geotagging of faults). When a call is received, the fault is diagnosed using a standard documented

process, which incorporates feedback loops and supporting case management of high impact customer issues, service recovery and improvement.


Sydney Water advised that the Customer Hub also has the ability to contact affected customers, that have provided contact details, in the event of an unplanned outage or planned network maintenance.

The Customer Hub uses visual score cards to monitor, measure and evaluate its performance. A live view of faults and complaints is available on the screens around the Customer Hub (and also elsewhere in the Operations Control Centre). The screens also provide a feedback score, for which Sydney Water advised approximately 15% of customers affected use to provide feedback. Sydney Water makes use of the 'Net Promoter Score', which provides a live score range between -100 to +100 (negative scores mean the comments are detractors).


According to Sydney Water, it has successfully reduced the number of properties affected by unplanned water discontinuity events by managing and prioritising the works, mitigating the overall increase in the number of properties affected by unplanned interruptions of all durations. Whilst this claim appears questionable given Sydney Water's performance in 2018/19, whereby the number of properties affected by unplanned interruptions of more than five continuous hours duration exceeded the Licence standard (refer section 2.2.6 (clause 4.2.2)), it is not possible to readily assess whether or not the total number of properties affected by unplanned interruptions of all durations would have been greater without Customer Hub intervention.

2.2. Detailed Audit Findings by Clause

2.2.1. Availability of Licence (1.8.1)

Clause	Requirement	Compliance Grade
1.8.1	<p>Sydney Water must make a copy of this Licence available to any person, free of charge:</p> <ol style="list-style-type: none"> website for downloading upon request made to the contact centre. 	 <p>Compliant</p>
Risk	<p>Failure to make copies of the <i>Operating Licence</i> available to any person presents no direct risk to public health or the environment; however, it presents a low level of risk in respect of customer relations. Availability of the Licence provides customers with a level of certainty on the customer experience they should expect and confidence that Sydney Water is being operated in the public's best interests.</p>	<p>Target for Compliance</p> <p>Evidence that Sydney Water has made a copy of the <i>Operating Licence</i> available on its website for downloading; provides copies upon request to its contact centre; and that there is no charge for providing such copies.</p>
Obligation	<p>This obligation requires that a copy of the <i>Operating Licence</i> is readily available, free of charge, to any person either on the Sydney Water website for downloading or upon request from the Sydney Water contact centre.</p>	
Evidence Sighted	<p>http://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mdq1/~edisp/dd_045161.pdf <i>Sydney Water response to 2019 Audit Questionnaire</i></p>	
Summary of reasons for Grade	<p>Sydney Water demonstrated that the <i>Operating Licence</i> is available on its website for downloading, and that it has arrangements in place to provide copies upon request to its contact centre. There are no charges levied in either case. Accordingly, Sydney Water is assessed to have demonstrated compliance with this obligation.</p>	
Discussion and Notes	<p>Sydney Water provided the following direct link to the <i>Operating Licence</i> on its website: http://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mdq1/~edisp/dd_045161.pdf As the Licence is to be readily available to any person, the auditor sought to locate it by navigation from the website "Home" page. This revealed that the Licence can also be located by:</p> <ul style="list-style-type: none"> searching for "Licence" or "Operating Licence" from the site header; or drilling down from the site header: About us > Reports & publications > Regulatory information, and selecting Operating Licence. <p>Sydney Water advised that:</p> <p><i>"Customer Experience Representatives are aware of the need to provide the Operating Licence to customers upon request. The "Find Answers" database provides guidance to staff regarding this requirement."</i></p> <p>The "Find Answers" database is an internal document database, which Customer Experience Representatives are readily able to interrogate to obtain guidance and/or information to enable them to respond to enquiries or requests.</p>	
Recommendation	<p>There are no recommendations in respect of this obligation.</p>	
Opportunities for Improvement	<p>No opportunities for improvement have been identified in respect of this obligation.</p>	
Supplemental Information	<p>In response to the auditor's enquiry, Sydney Water advised that it does not monitor the number of times copies of the Licence are requested by customers (or others).</p> <p>Sydney Water advised that it is, however, able to monitor how customers use information on its website through the use of key word searches.</p>	

2.2.2. Pricing (1.9.1)

Clause	Requirement	Compliance Grade
1.9.1	Sydney Water must set the level of fees, charges, and other amounts payable for its Services subject to the terms of this licence, the Act and the maximum prices and methodologies for fixing maximum prices determined from time to time by IPART under the IPART Act.	 Compliant

Risk

Failure to comply with the requirements of this obligation presents a risk that Sydney Water is either overcharging its customers or failing to recover the costs of providing the service.

Target for Compliance

Evidence that Sydney Water has set the level of fees, charges and other amounts payable for its Services subject to the terms of the Licence, the Act and the maximum prices and methodologies determined by IPART.

Obligation

This obligation requires Sydney Water to set fees and charges and other amounts payable for its Services in accordance with the relevant IPART Determination.

Evidence Sighted

Billing Systems & Supplier Contracts – July 2018 Quarterly Debit Raising Production Signoff, 18-Mar-18

Escalated prices 2018-19_approved_SWIM 803608, 31-May-18

IPART, *Determination; Maximum prices for water, sewerage, stormwater drainage and other services from 1 July 2016*, June 2016

IPART, *Review of prices for Sydney Water Corporation; From 1 July 2016 to 30 June 2020; Final Report*, June 2016

Letter dated 4 June 2018 from IPART to Sydney Water (re: *Consumer Price Index (CPI) movements and pricing information regarding IPART determined prices for Sydney Water Corporation – 2018-19*)

Sample bills showing the application of trade waste quality charges

Sydney Water, *Implementing IPART determined retail prices* (Version 2), 28-Jun-18

Sydney Water, *Operating Licence pricing audit*, August 2018

Sydney Water response to 2019 Audit Questionnaire

Sydney Water website “Our prices” pages: <http://www.sydneywater.com.au/SW/accounts-billing/understanding-your-bill/our-prices/index.htm>

Summary of reasons for Grade

Sydney Water demonstrated that it had set the level of fees, charges, and other amounts payable for its services during the audit period in accordance with the relevant IPART Determination. A detailed check of a sample of prices confirms that they have been correctly calculated in accordance with the relevant IPART Determination. Review of a small sample of customer bills confirms that the correct prices have been applied.

Sydney Water also demonstrated that it has an extensive portfolio of procedures in place to ensure that prices are correctly calculated and applied. These procedures include steps for independent checks, with records to be retained, and the conduct of random audits.

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

Discussion and Notes

In its response to the Audit Questionnaire, Sydney Water advised that:

“There were six IPART pricing determinations and one Premier's request under the IPART Act (s12A) which applied to prices for our services during 2018-19. These are:

- Retail prices – “Review of prices for Sydney Water Corporation June 2016 (Determination No.5 2016)”.*
- Wholesale prices – “Sydney Water Corporation, Maximum prices for wholesale water, sewerage and trade waste services from 1 January 2018 (excluding services supplied to recycled water systems), Determination No.4, 2017”. NB: We do not have a wholesale customer that fits this determination.*
- Dishonoured or declined and late payment fees – IPART specified these in the final report of the 2016 review of our retail prices fees as part of their Section 12A review.*
- Recycled water developer charges – “Pricing arrangement of recycled water and sewer mining, Sydney Water Corporation, Hunter Water Corporation, Gosford City Council and Wyong Shire Council, Determinations No.8 2006”.*
- Backlog sewerage charges – “Pricing of backlog sewerage charges services Sydney Water Corporation, Gosford City Council, Hunter Water Corporation, Wyong Shire Council, Developer Determination No. 4, 1997”.*
- “Developer charges for water, wastewater and stormwater – Sydney Water Corporation, Hunter Water Corporation, Gosford City Council, Wyong Shire Council, Developer charges from 1 October 2000, Determination No.9, 2000”.*

- “Maximum prices for connecting, or upgrading a connection, to a water supply, sewerage, or drainage systems. Sydney Water, Hunter Water and Central Coast Council”. This determination commenced on 2 November 2018. Sydney Water uses several different business processes and associated billing systems to levy the charges under each of these determinations and the Section 12A review. We have provided a schedule of each of the prices we charged in the 2018-19 financial year and evidence of correct charging in each case.

We also have documented procedures for the implementation of IPART determined prices.”

Sydney Water clarified that the ‘Backlog sewerage charges’ (Determination No. 4, 1997) had been replaced by the ‘Maximum prices for connecting or upgrading a connection ...’ determination in October 2018. IPART subsequently advised that the ‘Developer charges for water, wastewater and stormwater ...’ determination had also been replaced by the ‘Maximum prices for connecting or upgrading a connection ...’ determination. These determinations feature a process/formula based approach for pricing. Sydney Water indicated that it had received no applications under the new formula.

Sydney Water provided an extensive portfolio of process and sample pricing documentation to demonstrate that prices charged during the 2018/19 financial year were consistent with the relevant Determination and that quality assurance processes had been implemented. A sample of that documentation is referenced in the following discussion.

Pricing adjustments each year during the period for which a Determination applies is based largely on CPI changes. The values adopted are as advised by IPART, with the CPI change varying for each Determination. CPI changes for 2018/19 were:

- Sydney Water Determination No. 5, 2016: 4.1%
- Developer Charges, Determination No. 9, 2000: 1.5%
- Recycled Water and Sewer Mining, Determination No. 8 & 9, 2006: 1.9%
- Backlog Sewerage Charges, Determination No. 4.1, 1997: 2.1%.

The procedure *Implementing IPART determined retail prices* (SWIM 775467) details the process followed to implement new prices from 1 July each year. The process requires that the new prices are calculated by a Senior Regulatory Economist and then independently calculated by four other people and the values compared. Any differences are reviewed and the new prices agreed before sign-off by four managers. Approved prices are issued to relevant business units for implementation, principally through the ACCESS Billing System.

A signed copy of the 2018/19 Price Schedule (identified as *Escalated prices 2018-19*) was provided as evidence that the review process had been implemented; sign-off that the prices had been uploaded into the ACCESS Billing System and that the billing production process was tested each quarter was also provided.

A check of prices detailed in the 2018/19 Price Schedule revealed that all prices had been correctly calculated in accordance with the Sydney Water Determination No. 5, 2016. Evidence of calculation of the Sydney Desalination Plant adjustment was sought; this was not checked in detail, it appears that the formula for determining the adjustment had been correctly applied and adjustments to the water service charges correctly included in the 2018/19 Price Schedule.

A check of a sample of prices as published on the Sydney Water website (which still shows 2018/19 prices as well as the current 2019/20 prices) against prices shown in the 2018/19 Price Schedule revealed that the following were consistent with the calculated prices:

- Water service charge for your home (\$20.19 per quarter, which is consistent with the price for a standard 20mm residential meter).
- Wastewater service charge for your home (\$151.88).
- Drinking water usage charge (\$2.08 per kilolitre).
- Recycled water usage charge (1.86 per kilolitre).
- Stormwater charge for a business, property size 1001m² to 10,000m² (\$113.40 per quarter).
- Hourly rate for Sydney Water services (\$155.13 per hour, i.e. \$141.03 + GST).

It is noted that some quarterly charges vary marginally (typically by an amount of 1 cent) so that the annual charge is consistent with the determined charge. The charge published on the website is the maximum quarterly amount, which is considered appropriate.

As a further check, the calculated value of the dishonoured or declined payment fee and the Late payment fee were reviewed. As noted above, these fees were set by IPART in the *Review of prices for Sydney Water Corporation; From 1 July 2016 to 30 June 2020; Final Report*, as follows:

- dishonoured or declined payment fee – \$12.98 (\$2015/16)
- late payment fee – \$4.32 (\$2015/16).

In the 2018/19 Price Schedule, Sydney Water noted that based on email advice provided by IPART on 30 June 2016, these fees were escalated in 2016/17 using a CPI change of 1.3%. The CPI change of 4.1% advised by IPART in respect of prices set in accordance with Sydney Water Determination No. 5, 2016 was then applied to compute the fees applicable in 2018/19, before adding GST. On this basis, the prices shown in the 2018/19 Price Schedule were found to be correct; the charges published on the Sydney Water website are also consistent with the calculated values.

It is noted that, prior to the 2018 Operational Audit, Sydney Water had declared non-compliance with this obligation. It had incorrectly been levying trade waste substance charges at rates determined to two decimal places (rounded down) instead of three decimal places, which resulted in it levying the charges that were lower than the determined price without the required approval of the Treasurer. Review of the substance charges as documented in the approved pricing schedule for 2018/19 revealed that they have been correctly shown to three decimal places. Sydney Water also provided a sample of two bills issued to commercial customers which showed that the charges had been correctly levied; Sample 1 showed low strength biological oxygen demand (BOD) food waste correctly levied at a rate of \$2.375 per kL, whilst Sample 2 showed low strength BOD food waste correctly levied at a rate of \$2.375 per kL and high strength BOD food waste correctly levied at a rate of \$3.902 per kL.

It is further noted that in August 2018, Sydney Water had conducted an audit of fifteen (15) randomly selected charges effective from 1 July 2018 to ensure compliance with the prices approved by IPART. This revealed that the selected charges, which collectively represented more than 90 percent of the volume and value of bills issued by Sydney Water, had been found to be correctly applied.

On the basis of the above assessment, it is assessed that the fees, charges, and other payable amounts levied by Sydney Water during the audit period were consistent with the maximum prices and methodologies for fixing maximum prices determined from time to time by IPART.

Recommendation

There are no recommendations in respect of this obligation.


Opportunities for Improvement

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

Supplemental Information

No supplemental information is provided in respect of this obligation.

2.2.3. Drinking Water (2.1.1 & 2.1.2)

Clause	Requirement	Compliance Grade
2.1.1	<p>Sydney Water must maintain a Management System that is consistent with the Australian Drinking Water Guidelines, except to the extent that NSW Health specifies otherwise (the Drinking Water Quality Management System).</p> <p><i>[Note: Sydney Water is to implement the Drinking Water Quality Management System (DWQMS) to the Drinking Water system under its control in light of its knowledge of the entire drinking water supply system (from the water catchment to the Consumer).</i></p> <p><i>It is expected that the Drinking Water Quality Management System will be consistent with the Framework for Management of Drinking Water Quality. However, where NSW Health considers it appropriate, the application of the Australian Drinking Water Guidelines (ADWG) may be amended or added to, to take account of Sydney Water's circumstances and/or Drinking Water quality policy and practices within New South Wales.]</i></p>	 <p>Compliant (minor shortcomings)</p>
Risk	Target for Compliance	
Without a comprehensive DWQMS, there is a high risk that Sydney Water may not be able to effectively manage risks to water quality and protect public health.	Evidence that a DWQMS is established, maintained and kept up to date, and that it is consistent with the ADWG, as specified by NSW Health.	
Obligation		
Sydney Water has an obligation to develop a DWQMS that manages risks to water quality that may impact upon public health. The DWQMS should be current and systematically reduce risks to an acceptable level through appropriate controls. The scope of the DWQMS must include all drinking water schemes bound by Sydney Water's <i>Operating Licence 2015 – 2020</i> .		
Evidence Sighted		
<p>Alex Micallef, Email: <i>Follow-up question - IPART - Op Licence Audit 2018-19</i>, 12-Sep-19</p> <p>Alex Micallef, Email: <i>Question on notice 3. SW spec requirement for materials</i>, 12-Sep-19</p> <p><i>Bulk Chemical Data Capture and Assessment (OS0015)</i>, 13-Aug-18</p> <p>Cintellate, <i>Possible Sewage in water main Queen St Strathfield (SWIRL INC-22180)</i>, Aug-19</p> <p><i>CMS-Maximo - Customer Complaint Monthly Report June 2019</i>, Jun-19</p> <p>Colin Storey, <i>Woronora PFD Field</i>, 31-Jul-19</p> <p>Greg Staveley, Email: <i>Backflow 1 Evidence</i>, 11-Sep-19</p> <p>Greg Staveley, Email: <i>Backflow 2 Evidence</i>, 12-Sep-19</p> <p>Michael Easton, <i>Fluorescent green drinking water at customers taps FINAL (INC-25464)</i>, 18-Apr-19</p> <p><i>Networks WQ RA Woronora Illawarra PH (v3)</i></p> <p><i>Operational Risk Assessment Workshop SOP (D0000799)</i></p> <p>Plumbers Connection, <i>Plumbers Connection Spring 2019 Rd Extract - Cross connection article</i>, Spring-2019</p> <p>Raema Melverton, Email: <i>Corporate Reputation Strategy</i>, 12-Sep-19</p> <p>Submission from NSW Health H19/66902</p> <p>Sydney Water, <i>2018-19 Drinking Water Product Improvement Plan (1009538)</i></p> <p>Sydney Water, <i>4th Quarterly Drinking Water Quality Monitoring Report to NSW Health</i>, 2018-19</p> <p>Sydney Water, <i>Annual Drinking Water Operational Monitoring Plan 2018-19</i>, 2018-19</p> <p>Sydney Water, <i>Annual Drinking Water Operational Monitoring Plan 2018-19</i>, 2018-19</p> <p>Sydney Water, <i>Annual Drinking Water Quality Compliance Monitoring Plan 2018-19 (821415)</i>, Jul-18</p> <p>Sydney Water, <i>Approved List of Chemicals and Change Management Process (D0000643)</i>, 12-Sep-17</p> <p>Sydney Water, <i>Assurance and Monitoring (Audits and Inspections) (SDIMS0010)</i></p> <p>Sydney Water, <i>Business Resilience Manual (D0000504)</i>, 9-Jan-19</p> <p>Sydney Water, <i>Business Resilience Policy (D0000503)</i>, 8-Jan-19</p> <p>Sydney Water, <i>Calibration and Maintenance of HACH 2100P Portable Turbidimeter (WS0001)</i>, 9-Jul-16</p> <p>Sydney Water, <i>Catchment to customer water quality risk review procedure (BMIS0249)</i>, 23-Mar-18</p> <p>Sydney Water, <i>Catchment to customer water quality risk review procedure (BMIS0249)</i>, 23-Mar-18</p> <p>Sydney Water, <i>CCP OCP Exceedance Response Plan (MAN-7591)</i></p> <p>Sydney Water, <i>CD Dashboard Report (Group Executive team) - June 2019</i>, Jun-19</p> <p>Sydney Water, <i>CD Dashboard Report (Group Executive team) - June 2019</i></p>		

Sydney Water, *CMS screen shot - Example of customer complaint 28-03-19 (1-S0598M)*, 28-Mar-19

Sydney Water, *Coagulation Flocculation - Unit Process Guideline (UPG) (Generic) (WTHQ5024)*, 31-Apr-15

Sydney Water, *Communications Plan 2018-19*

Sydney Water, *Competency assessment - AWQS Pip Bain - Updated Aug 18, 2018-19*

Sydney Water, *Compliance Accountability Register (ICONN_UD_770397)*, 2019

Sydney Water, *Control Chart - Chlorine - pH HPCs control charts All Systems*, Jun-19

Sydney Water, *Control Chart - Nitrification control chart Woronora Delivery System*, Jun-19

Sydney Water, *Cryptosporidium and Giardia (C&G) detection in Raw Water (BMIS0038)*, Dec-18

Sydney Water, *CSR Monthly Scorecard (Dashboard May 2019)*, May-19

Sydney Water, *Customer Complaints Procedure (735113)*, 8-Aug-19

Sydney Water, *Customer WQ Awareness Training Matrix*, 2019

Sydney Water, *Determination of Chlorine Residuals in the Field (FS075)*

Sydney Water, *Development Program for Customer Water Quality Scientist (PBP0001)*, 2-Jul-19

Sydney Water, *Dialysis Chlorine Notification Arrangements (AR0005)*, 1-Jul-16

Sydney Water, *Digital engagement:*
<http://www.sydneywater.com.au>
<https://www.sydneywatertalk.com.au>
<http://oursydneyourwater.com.au>

Sydney Water, *Document Management (SDIMS0008)*, Mar-19

Sydney Water, *Document Management (SDIMS0008)*, Mar-19

Sydney Water, *Drinking Water Management Manual (BMIS0213)*, 17-Jul-18

Sydney Water, *Drinking Water Management Manual (BMIS0213)*, 27-Jul-18

Sydney Water, *Drinking Water Management Manual (BMIS0213)*, 27-Jul-18

Sydney Water, *Drinking Water Management Manual (BMIS0213)*, 27-Jul-18

Sydney Water, *Drinking Water Management Policy (BMIS0213.13)*, 21-Jun-18

Sydney Water, *Drinking Water Product Specifications (IMS0152.01)*

Sydney Water, *Drinking Water Quality 5 Year Plan 2018-19 (821418)*

Sydney Water, *DWQ Event Management (WPIMS5228)*

Sydney Water, *DWQ Event Management (WPIMS5228)*, 19-Jun-19

Sydney Water, *DWQ Event Management (WPIMS5228)*, 1-Nov-18

Sydney Water, *DWQEMP Awareness Training - Completed Training Report (WPIMS5228)*

Sydney Water, *Email - Automated email notification from AMD's Actions Database (E. coli Beacon Hill Reservoir)*, 9/01/2019

Sydney Water, *Email: Response to IPART Audit*, 17-Sep-19

Sydney Water, *Email: Transmittal of 1 Oct OL Reports for 2017-18*, 27-Sep-18

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Summary of reasons for Grade

Sydney Water was assessed as being Compliant (with minor shortcoming) for this clause. The evidence demonstrates that Sydney Water is maintaining a DWQMS that is overall consistent with the ADWG, except for element 4 where the full requirement is not met in relation to the quality assurance of chemicals.

The requirement under element 4 is to establish documented procedures for evaluating chemicals and suppliers. While Sydney Water has this procedure in place for its bulk chemicals and bulk suppliers, there is no similar procedure for the smaller quantities of chlorine solution used in the networks and for the associated supplier(s).

It is considered that this shortcoming is minor as a review of the procurement process documented still verifies that the sodium hypochlorite (which is an approved chemical by Sydney Water) used should not include stabilisers or cyanates but Sydney Water has no procedures to evaluate this requirement. The minor shortcoming does not affect water quality, public health and safety.

Discussion and Notes

In order to meet the obligation of this clause Sydney Water must develop a DWQMS in accordance with the 12 elements of the ADWG framework for management of drinking water quality. Compliance has therefore been discussed in relation to each of the elements.

Based on the evidence provided and stakeholder feedback it appears that NSW Health have not specified any amendment or addition to the requirements of the ADWG.

Element 1

The requirement as per the ADWG for element 1 is to maintain a drinking water quality policy, regulatory and formal requirements and a process for engaging stakeholders. The evidence demonstrates consistency with the ADWG requirements. It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for element 1.

Drinking Water Quality Policy

The ADWG requires a drinking water quality policy to be developed. The *Drinking Water Management Policy* (date reviewed: 28/6/18) has been developed and has been endorsed by the Acting Managing Director.

Regulatory and Formal Requirements

The ADWG requires relevant regulatory and formal requirements to be documented. Regulatory and formal requirements have been identified in the *Compliance Accountability Register*, which is referenced in section 1.2 of the *Drinking Water Management Manual* (DWMM).

Engaging Stakeholders

The ADWG requires identification of stakeholders who could affect, or be affected by, decisions or activities of Sydney Water.

- The DWMM identifies important stakeholders and explains the mechanisms relating to their commitment and involvement (Section 1.3).
- Sydney Water has an MoU with NSW Health. The MoU specifies the engagement process, including the Joint Operational Group (JOG) and Strategic Liaison Group (SLG).

Element 2

The requirement as per the ADWG for element 2 is to assess the water supply system and water quality data and to undertake and maintain an appropriate risk assessment process. The evidence demonstrates consistency with the ADWG requirements. It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for element 2.

Water Supply System Analysis

The ADWG requires a team to be assembled, a flow diagram for catchment to consumer to be constructed and characteristics of the scheme to be developed, which has been addressed as follows:

- A risk assessment team with appropriate knowledge is assembled for risk assessment workshops. NSW Health is invited to all workshops.
- The procedures for guiding the Catchment to Customer (C2C) risk review and operational water quality risk assessments are available, which include ensuring that NSW Health is invited.
- The BOOT contractors also use Sydney Water's procedure for guiding water quality risk assessment workshops, which require NSW Health to be invited.
- PFDs have been created for the water supplies, for example, Woronora PFD was provided.
- There is a work instruction on creation of PFDs. The PFDs are reviewed annually in conjunction with the annual water quality risk assessments. It will be useful to include the review of the PFD for currency and accuracy as an explicit step in the *Operational Risk Assessment SOP* (refer to **OFI-SWC-2019-01**).

Assessment of Water Quality Data

The ADWG requires that historic data is used to identify exceedances, identify trends and identify potential problems.

A briefing paper or information pack is developed and provided prior to the risk workshops that collates pertinent information, including the relevant PFDs and water quality data trends.

Hazard Identification and Risk Assessment

The ADWG requires that a defined approach is to be used for the risk assessment documenting hazards and hazardous events, the level of risk for each hazard or hazardous event is to be estimated, the uncertainty is to be evaluated and significant risks and priorities for risk management are to be identified, which has been addressed as follows:

- The approach and methodology used for risk assessment is described in the review SOPs (BMIS0249 - *Catchment to customer water quality risk review procedure* and D0000799 - *Operational risk assessment workshop SOP*). The C2C risk assessment is the overall strategic risk assessment and the annual operational risk assessments are plant specific.
- There are operational risk assessment spreadsheets (e.g. Woronora was provided) and KnowRisk (risk assessment software used by Sydney Water) which include hazards, hazardous events, risk evaluation and uncertainty consideration.
- the risk assessments are periodically reviewed. The C2C water quality risk review procedure sets out requirements for the review. The operational risk assessment workshops (KnowRisk Review) are undertaken annually to review risks.

Element 3

The requirement as per the ADWG for element 3 is to identify and document preventive measures, multiple barriers and CCPs. The evidence demonstrates consistency with the ADWG requirements. It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for element 3.

Preventive Measures and Multiple Barriers

The ADWG requires preventive measures for significant risks and additional preventive measures for unacceptable risks to be identified, which has been addressed as follows:

- Preventive and control measures are identified through the C2C risk review and operational water quality risk assessments. The operational risk assessments are captured in KnowRisk.
- The risk assessments evaluated the residual risks considering the preventive and control measures. Risk treatments were identified where improvements were needed.

Critical Control Points

The ADWG requires preventive measures and CCPs to be identified from catchment to consumer.

The Drinking Water Product Specification identifies the CCPs/Operational Control Points (OCPs), their limits and monitoring requirements. The justification for selecting CCPs/OCPs is also given in the Drinking Water Product Specification.

Element 4

The requirement as per the ADWG for element 4 is to identify and document operational procedures, develop an operational monitoring plan, document procedures for corrective actions, establish a program for equipment capability and maintenance and establish documented procedures for evaluating chemicals, materials and suppliers to ensure only approved materials and chemicals are used.

The evidence demonstrates that the full requirement for chemical quality assurance, as per the ADWG element 4, has not been met. The requirement is to establish documented procedures for evaluating chemicals and suppliers. While Sydney Water has this procedure in place for bulk chemicals, there is no similar procedure for smaller quantities of chlorine solution used in the networks.

It is considered that this shortcoming is minor as the procurement process documented still verify that sodium hypochlorite (which is an approved chemical by Sydney Water) is used, and that stabilisers or cyanates are absent in the procured chlorine solution. Hence it does not affect water quality, public health and safety.

Operational Procedures

The ADWG requires procedures for processes and activities from catchment to consumer to be documented and compiled into an operations manual, which has been addressed as follows:

- There are procedures for processes and activities (a list of procedures was provided from Sydney Water and Veolia for Woronora). It will be useful to demonstrate clearly that all required procedures have been identified for processes and activities from 'catchment to consumer' for each scheme, for example, through a SOP mapping exercise per scheme. This will ensure that there are no unintentional gaps and the preventive measures in the risk assessment registers have an associated SOP, as relevant, which can monitor implementation of the respective preventive measure (refer to **OFI-SWC-2019-02**).
- The current procedures are available in Sydney Water's ISO 9001 certified Integrated Management System (IMS)

Operational Monitoring

The ADWG requires operational monitoring to be identified and documented in an operational monitoring plan.

There is a *Drinking Water Quality Operational Monitoring Plan*, which is prepared annually and covers the monitoring of routine grab samples, project-based (routine & non-routine) and event/incident monitoring. Monitoring is undertaken by National Association of Testing Authorities (NATA) accredited labs. The plan also illustrates examples of control charts and trending reports that are produced from the data on a monthly basis.

Corrective Action

The ADWG requires procedures for corrective actions to control excursions to be developed and rapid communication systems to deal with unexpected events to be in place.

Corrective actions are performed onsite by operators using procedures including daily workflow and process monitoring and process and decision-making procedures. Each Sydney Water WFP has Unit Process Guidelines (UPG), which include a

trouble shooting guide for any operational abnormalities. Veolia has an equivalent document MAN-7591 *CCP OCP Exceedance Response Plan*.

Equipment Capability and Maintenance

The ADWG requires a program for regular inspection and maintenance of all equipment, including monitoring equipment to be developed, which has been addressed as follows:

- Sydney Water has a preventive maintenance program (Maximo – Sydney Water’s AMS) to ensure that equipment and instruments are maintained for reliable and accurate operation. For Woronora WFP, calibration and maintenance records by Veolia are stored in their VAMS.
- SOP’s for equipment calibration, including schedules are maintained in IMS.

Materials and Chemicals

The ADWG requires only approved materials and chemicals to be used and requires a procedure for evaluating chemicals, materials and suppliers, which has been addressed as follows:

- Sydney Water maintains a list of approved chemicals for use in drinking water and change management process for new chemicals (D0000643 *Approved List of Chemicals and Change Management Process*). Sydney Water regularly carries out chemical contaminants data analysis and checks the supplier’s compliance with specifications (OS0015 *Bulk Chemical Data Capture and Assessment Work Instructions*).
- Veolia uses Sydney Water’s list of approved chemicals, but this is not clearly stated in their DWQMP. Veolia’s DWQMP should clearly indicate that the approved chemicals specification used is the list of approved chemicals from Sydney Water (refer to **OFI-SWC-2019-03**).
- Sydney Water uses 1% chlorine solution (brand name: Clilorite) for work undertaken in the network (e.g. for mains breaks and new water mains). The chlorine solution is sodium hypochlorite, which is an approved chemical. This solution is used in small volumes and is procured ad hoc by Civil teams (not procured as a bulk chemical). There is no documented process or procedure for evaluating this specific chemical product and the associated supplier(s) (refer to **REC-SWC-2019-01**).
- Compliance with approved materials (*AS 4020 Testing of products for use in contact with drinking water*) is mandated through relevant specifications and codes (CPDMS0023 - Technical Specifications Part 1 Civil Works), with the process incorporated into Sydney Water’s cloud-based application (SWDelivery Data Portal).

Element 5

The requirement as per the ADWG for element 5 is to develop a drinking water quality verification monitoring plan, establish a customer complaints process, develop a process for short-term evaluation of results and document procedures for corrective actions. The evidence demonstrates consistency with the ADWG requirements. It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for element 5.

Drinking Water Quality Monitoring

The ADWG requires characteristics to be monitored in the distribution system and in water as supplied to the consumer to be documented in a monitoring plan, which has been addressed as follows:

- Sydney Water has a *Drinking Water Quality Compliance Monitoring Plan*, which is prepared annually. Sydney Water complies with the monitoring requirements set out in the *Sydney Water Reporting Manual Operating Licence 2015-2020*.
- The monitoring plan details sampling locations, frequency of sampling and the water quality characteristics to be monitored.
- As part of the annual review of the monitoring plan, population statistics are reviewed to ensure compliance with ADWG sample number requirements. The samples are tested at Sydney Water’s laboratory which is NATA accredited.

Consumer Satisfaction

The ADWG requires a complaints response program to be developed, which has been addressed as follows:

- Water quality complaints are received through Sydney Water’s Call Centre. The *Managing Water Quality Customer Complaints* work instruction provides the approach to management and resolution of complaints from consumers. Complaints and responses are recorded in Sydney Water’s Customer Management System (CMS).
- Water Quality Scientists are responsible for managing water quality complaints. Area Water Quality Scientists are developed through a dedicated program that involves hands on training and a competency-based program run alongside experienced Water Quality Scientists (as per procedure Development and Succession Planning for Area Water Quality Scientist). Reviews of their performance are documented to improve their understanding and performance.

Short-term Evaluation of Results

The ADWG requires a procedure for the daily review of drinking water quality monitoring data and consumer satisfaction, as well as reporting, which has been addressed as follows:

- Verification data is stored in Sydney Water’s Business Intelligence (BI) system. Grab samples of drinking water supplied are analysed by the laboratory and results stored in the Laboratory Information Management System (LIMS). Data is then transferred into the ‘Monitoring Universe’, which is a dataset within the (Business Intelligence) BI system. Non-conformances in relation to water quality grab sampling data analysed by the laboratory are reported through daily exception reports.
- The Customer Sentiment Monitor also seeks feedback on consumer satisfaction across a number of Sydney Water products and services.

Corrective Action

The ADWG requires a procedure for corrective actions in response to non-conformance or consumer feedback, as well as a rapid communication system to deal with unexpected events, which has been addressed as follows:

- Corrective actions on non-conformances are managed using *Triggers, Notification & Actions for Adverse WQ Results Work Instruction*, and *Drinking Water Quality Emergency Management Plan* (DWQEMP). Records of investigations are maintained e.g. in Sydney Water Incident Recording and Learnings (SWIRL) system. Other review and response systems include real time telemetry of water quality and quantity measurement and alarms (SCADA & IICATS) which are monitored continuously by the SOC, including high and low alarms set on operational target criteria and real time monitoring of customer complaints trends e.g. dirty water events (work instruction provided).
- Woronora WFP (Veolia) has a site-specific procedure, which outlines the rapid operational response plan for OCP and CCP exceedances.
- Investigations are also undertaken when non-compliant results or potential issues are suspected. An example of such an investigation was the detection of fluorescein in a drinking water main as result of customer complaints.

Element 6

The requirement as per the ADWG for element 6 is to define communications protocols, develop a communications strategy, document incident and emergency response protocols, train employees and test the protocols. The evidence demonstrates consistency with the ADWG requirements. It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for element 6.

Communication

The ADWG requires communication protocols with the relevant agencies and media, as well as a contact list of key people, agencies and businesses, which has been addressed as follows:

- Sydney Water has an agreed joint communications protocol in place with WaterNSW and NSW Health for drinking water incidents and emergencies. While the agencies will be working very closely together during an incident or emergency, it will be useful to include timeframes in the communications approval process within which an agency will need to respond by to ensure that the decisions are made in a timely manner and communication is relayed to customers as soon as possible, where there is a need (refer to **OFI-SWC-2019-04**).
- The current contact list, D0001088 *Water Quality Management Contacts*, resides in the Business Management Information System (BMIS). It is regularly reviewed as part of BMIS requirements and shared with NSW Health and WaterNSW.
- The Communications Team manage and maintain the communications protocols with the public and media. The *Sydney Water Communications Plan 2018-19* was provided.

Incident and Emergency Management

The ADWG requires potential incidents and emergencies and the response protocols to be defined and documented, including training to be provided and procedures to be tested, which has been addressed as follows:

- Sydney Water has an overall *Incident Management Procedure* (D0000506) and *Emergency Management Procedure* (D0000507). These procedures set out the overall approach to incident management and the DWQEMP deals directly with water quality. The DWQEMP has triggers for reporting events and incidents to NSW Health and any escalation that may be required. Response protocols are stated in the DWQEMP.
- Woronora WFP (Veolia) has their own emergency management plan and specific emergency procedure addressing specific water quality risks. The *Incident and Emergency Management Manual* (Woronora - MAN-7793) and the *Reporting of Water Quality Incidents and Breaches* (WIS-5347), establish the relevant contacts and the communication procedures for incidents of various types and levels of severity.
- Training is provided on the DWQEMP to all required staff, including BOOT plants.
- Sydney Water also has a program of regular training and joint exercises with key stakeholders. A tripartite exercise program between Sydney Water, WaterNSW, and NSW Health is developed routinely through the JOG and the SLG. The last tripartite scenario between these agencies was titled the Exercise Hume. The next tripartite exercise was scheduled to be held in April 2019 but was then deferred to March 2020, in agreement with the stakeholders (including NSW Health).

Element 7

The requirement as per the ADWG for element 7 is to develop employee awareness and involvement mechanisms and ensure that employees and contractors are trained and maintain their qualifications. The evidence demonstrates consistency with the ADWG requirements. It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for element 7.

Employee Awareness and Involvement

The ADWG requires employees' awareness of and participation in drinking water quality management to be developed.

Sydney Water's has various mechanisms and communication processes to increase employee awareness and participation in drinking water quality management, which include induction and competency programs, development programs, internal and external training workshops/conferences, divisional updates, newsletters, noticeboards, emails, seminars, team meetings, incident and event reporting through SWIRL, internal forums, external forums with key stakeholders (including WaterNSW, NSW Health, WFP BOOT operators), Sydney Water's intranet and internal social media.

Employee Training

The ADWG requires employees, including contractors, to maintain appropriate experience and qualifications, which has been addressed as follows:

- Formal training and skills maintenance are managed through Contribution Development Plans (CDPs), which are agreed between each staff member and their respective line manager. Performance of staff is reviewed and assessed through the CDP process. Training requirements can also be allocated through this process to ensure that staff are adequately trained to undertake their duties.

- BOOT plants have their own training matrix that ensure all personnel understand their roles and responsibilities in the management of water quality. For Woronora (Veolia), this is documented in the Woronora Training Matrix. Sydney Water deliver training (e.g. DWQEMP) to BOOT plants. The training matrix maintained by BOOT plants should include a category on Sydney Water Procedures and Processes. The key requirements under this category should be developed in consultation with Sydney Water and it would demonstrate that BOOT employees are made aware of Sydney Water's requirements regarding drinking water quality management (refer to **OFI-SWC-2019-03**).
- At the corporate level, training records are managed via the Compass software package. Compass is used to assign training needs to staff, track completion of that training and store all relevant records. BOOT operators use their own record system.

Element 8

The requirement as per the ADWG for element 8 is to develop a strategy for community involvement and consultation and to keep consumers informed on water quality. The evidence demonstrates consistency with the ADWG requirements. It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for element 8.

Community Consultation

The ADWG requires a comprehensive strategy for community consultation and effective community involvement to be developed, which has been addressed as follows:

- Sydney Water has an overarching policy on community and stakeholder engagement. The consultation strategy or engagement activities undertaken are listed in Table 8-1 of the DWMM.
- Sydney Water's Communications and Public Affairs unit delivers community involvement through a range of approaches such as the Sydney Water website and social media, examples were provided.
- Sydney Water engages with specific community sections on their needs, e.g. dialysis customers. The procedure on notification arrangements for dialysis patients was provided.

Communication

The ADWG requires an active two-way communication program to inform consumers and promote awareness of drinking water quality issues to be developed.

Customers can get information on drinking water quality via a range of means (e.g. phone, email, website, reports, social media).

Element 9

The requirement as per the ADWG for element 9 is to maintain a research and investigation program, validate processes and validate selection and design of new equipment. The evidence demonstrates consistency with the ADWG requirements. It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for element 9.

Investigative Studies and Research Monitoring

The ADWG requires a program is to be developed to increase understanding of the water supply system, which has been addressed as follows:

- Sydney Water has a research function within the Corporate Strategy Group. The Research and Development (R&D) program sets out Sydney Water's current research portfolio under Sydney Water's *Research and Innovation Strategy Towards 2020 and Beyond*. Sydney Water has a detailed Governance Framework which includes the process for identifying and determining if a research project is undertaken.
- Sydney Water has a research program developed with the private sector partners for BOOT plants, which includes R&D, technology transfer and fellowships available to staff to foster knowledge and skills exchange.
- Research projects can be identified through the C2C risk assessment and operational risk assessments. A number of research projects are being implemented out of the *Product Management Improvement Framework* e.g. natural organic matter (NOM) research.

Validation Processes

The ADWG requires processes and procedures to be validated to ensure that they are effective in controlling hazards.

Sydney Water undertakes validation for new technology and instrumentation for drinking water monitoring on an as required basis. In-house technical expertise in process designs is utilised to manage validation. *C.t* calculation models have also been developed for the water supplies.

Sydney Water maintains awareness of industry issues and new technology developments via multiple means, including Water Services Association of Australia (WSAA), WSAA Water Quality Network, Water Research Foundation (via WSAA), Water Environment Research Foundation, WaterReuse Foundation, National Centre of Excellence in Desalination, UKWIR (United Kingdom Water Industry Research) and Water Research Australia and Technology Approval Group (TAG).

Design of Equipment

The ADWG requires the selection and design of new equipment and infrastructure to be validated to ensure continuing reliability.

Section 9.3 of the DWMM states that “*Equipment is selected based on its ability to meet a Functional Design Specification, with operators involved in acceptance testing. New equipment must meet intended requirements and provide necessary process flexibility and controllability as required.*”

Element 10

The requirement as per the ADWG for element 10 is to establish a process for management of documentation and records and maintain internal and external reporting. The evidence demonstrates consistency with the ADWG requirements. It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for element 10.

Management of Documentation and Records

The ADWG requires a document management system to be developed to ensure currency, as well as a records management system to be developed, which has been addressed as follows:

- Documentation related to drinking water quality management are managed through a certified IMS.
- Version control is managed by the rules built into the database.
- Records are managed as per Sydney Water's records management requirements. Key records are maintained in systems such as MAXIMO, SWIRL, Sydney Water's Information Management (SWIM), Compass (Sydney Water's performance and learning software platform). Records related to specific areas are maintained locally as well (e.g. plant log sheets).
- The documentation is controlled through the BMIS database with specified review periods. Automated emails are sent to document owners as review reminders. Documents are reviewed at specified frequencies or when there are significant changes to the process. The currency of documents is monitored against agreed Key Performance Indicators (KPIs) and reported monthly to stakeholders and management.

Reporting

The ADWG requires procedures for external and internal reporting and an annual report is also to be produced, which has been addressed as follows:

- Monitoring performance of key processes and regular reporting occurs at all levels. Monthly reports are prepared and circulated to all business managers and portfolio holders to inform performance and take necessary action. External compliance reports are specified by the *Sydney Water Reporting Manual Operating Licence 2015-2020*.
- An annual report is also produced for consumers and published on Sydney Water's website.

Element 11

The requirement as per the ADWG for element 11 is to undertake long-term evaluation of results and establish processes for internal and external audits. The evidence demonstrates consistency with the ADWG requirements. It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for element 11.

Long-term Evaluation of Results

The ADWG requires long-term data to be collected and evaluated to assess performance and identify problems, which has been addressed as follows:

- Long-term analysis of drinking water quality is performed by Sydney Water, each quarter and during the risk assessment process (documented in the briefing paper or similar document).
- The Quarterly Drinking Water Quality Report is available on Sydney Water website. It is prepared in accordance with procedure MP0023. A report with data and information analysis is also provided to NSW Health each quarter, prepared in accordance with procedure MP0017.

Audit of Drinking Water Quality Management

The ADWG requires a procedure for internal and external audits, which has been addressed as follows:

- External audits of the operating licence are undertaken annually (financial year period).
- Sydney Water has a process for internal audits, and the procedure was provided. DWQMS audits are incorporated into the IMS audits, the list of completed IMS audits in 2018-19 was provided. All audit related information is recorded in a database (BMIS Audit database). Audits are scheduled through the database and the reports resulting from the audits are also recorded in the same database. Improvement actions arising from audits are also raised in BMIS and completion of actions are managed through a workflow within the system (BMIS).
- There is a list of internal environmental auditors. There is no similar list for internal water quality auditors. Sydney Water uses external contractors for undertaking the WFP water quality audits. The *Assurance & Monitoring Procedure - Audit & Inspections* does not include the use of external auditors. The responsibility for process monitoring (Section 5 of the procedure) should be with a Sydney Water employee where the lead auditor is an external contractor (refer to **OFI-SWC-2019-05**).

Element 12

The requirement as per the ADWG for element 12 is for senior executives to review the DWQMS and to develop and implement an improvement plan. The evidence demonstrates consistency with the ADWG requirements. It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for element 12.

Review by Senior Executive

The ADWG requires senior executives to review the effectiveness of the management system.

Senior executives regularly (annually) review the performance of the DWQMS, in accordance with the *Management Review* (SDIMS0012) procedure. In addition to JOG and SLG meetings, Customer Delivery (CD) dashboard reports to Group executive team and monthly water performance meetings provide a level of executive reviews.

Drinking Water Quality Management Improvement Plan

The ADWG requires a drinking water quality management improvement plan to be developed, which has been addressed as follows:

- There is a *Drinking Water Improvement Plan*, comprised of two items:
 - The *Product Management Improvement Framework*, which describes the approach used to identify the improvement programs and initiatives.
 - The *Product Management Improvement Register*, which records the improvement programs and initiatives.
- The *Drinking Water Product Improvement Plan* is presented to NSW Health during quarterly JOG meeting and any outstanding and completed actions are also discussed.

Recommendation

The following recommendation is made in respect of this obligation:

REC-SWC-2019-01: By 30 June 2020, establish documented procedures for evaluating the chlorine solution used in network maintenance activities and for evaluating associated supplier(s).


Opportunities for Improvement

The following opportunities for improvement are made in respect of this obligation:

- **OFI-SWC-2019-01:** Include the review of the PFD for currency and accuracy as an explicit step in the *Operational Risk Assessment* SOP.
- **OFI-SWC-2019-02:** Demonstrate clearly that all required procedures have been identified for processes and activities from 'catchment to consumer' for each scheme. This could be, for example, through a SOP mapping exercise per scheme.
- **OFI-SWC-2019-03:** Sydney Water should discuss with Veolia (and other BOOT operators) and ensure that:
 - documentation of the BOOT operators reflect that the approved chemicals specification used is based on the list of approved chemicals from Sydney Water
 - where a training matrix is maintained by BOOT operators (e.g. Veolia), it should include a category on Sydney Water Procedures and Processes. The key requirements under this category should be developed in consultation with Sydney Water.
- **OFI-SWC-2019-04:** Undertake discussions with NSW Health and WaterNSW to include timeframes in the joint communications approval process within which an agency will need to respond by to ensure that the decisions are made in a timely manner and communication is relayed to customers as soon as possible, where there is a need.
- **OFI-SWC-2019-05:** Review the procedure on *Assurance & Monitoring - Audit & Inspections* (SDIMS0010) to include the use of external auditors. Currently there is no provision for external auditors and auditor responsibilities include monitoring the implementation of audit actions, which is not possible for an external. Therefore, it would be beneficial to clarify that the responsibility for Process Monitoring (Section 5 of the procedure) is with a Sydney Water employee where the lead auditor is an external contractor.

Supplemental Information

No supplemental information is provided in respect of this obligation.

Clause	Requirement	Compliance Grade
2.1.2	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.	<div></div> <div>Compliant (minor shortcomings)</div>
Risk	Target for Compliance	
If the DWQMS is not fully implemented, there is a high risk that Sydney Water may not be able to effectively manage risks to water quality and protect public health.	Evidence that the DWQMS is fully implemented and that all relevant activities are carried out in accordance with the System, including to the satisfaction of NSW Health.	
Obligation		
Clause 2.1.1 of the Operating Licence requires that Sydney Water maintains a DWQMS in accordance with the ADWG. In this clause (2.1.2), Sydney Water is required to fully implement the DWQMS and ensure that activities are undertaken as specified in the DWQMS to manage risks to water quality. In order to demonstrate that the actions are being undertaken as per the DWQMS, appropriate records must be maintained.		
Evidence Sighted		
<p>Audit Report - Nepean WFP (A0000468), 24-Jun-19</p> <p>C2C Working Group meeting Final Minutes, 21-Jun-19</p> <p>Compass report 2018 Work Safely at Heights Training, 11-Dec-18</p> <p>Email: Backflow 1 Evidence, 11-Sep-19</p> <p>Email: Backflow 2 Evidence, 12-Sep-19</p> <p>Email: Corporate Reputation Strategy, 12-Sep-19</p> <p>Email: Follow-up question - IPART - Op Licence Audit 2018-19, 12-Sep-19</p> <p>Email: Question on notice 3. SW spec requirement for materials, 12-Sep-19</p> <p>Fluorescent green drinking water at customers taps FINAL (INC-25464), 18-Apr-19</p> <p>Investigation - Fishbone (INC-24225)</p> <p>IXOM, Certificate - IXOM chemical awareness course - ASM Mohiuddin, 6-Mar-19</p> <p>IXOM, Veolia Chemical Delivery Docket (Aqua Ammonia), 1-May-19</p> <p>Labware, Labware - Example of daily nitrogen results, 6-Mar-19</p> <p>List of high risk properties</p> <p>Networks Water Quality Risk Assessment - Woronora Illawarra(v3)</p> <p>Submission from NSW Health H19/66902</p> <p>Sydney Water response to 2019 Audit Questionnaire</p> <p>Sydney Water, 2nd Quarterly Drinking Water Quality Monitoring Report to NSW Health, 2018-19</p> <p>Sydney Water, 4th Quarterly Drinking Water Quality Monitoring Report to NSW Health, 2018-19</p> <p>Sydney Water, Agenda JOG Final, 20-May-19</p> <p>Sydney Water, Automated email notification from AMD's Actions Database (E. coli Beacon Hill Reservoir), 9-Jan-19</p> <p>Sydney Water, Bushfire Awareness and Incident Control Training Records (PLCDC-84502)</p> <p>Sydney Water, Catchment to Customer Mid-Term Risk Review (Item 4.5)</p> <p>Sydney Water, Catchment to customer water quality risk review procedure (BMIS0249)</p> <p>Sydney Water, Chlorine Ammonia Notification reports, 28/02/2019</p> <p>Sydney Water, Compass - Summary of WQ training 18-19, 2018-19</p> <p>Sydney Water, Completed Training – Drinking Water Quality and Event Management Plan</p> <p>Sydney Water, Compliance Accountability Register (2019) (ICONN_UD_770397)</p> <p>Sydney Water, Creation of Process Flow Diagrams WI (D0000685)</p> <p>Sydney Water, Customer WQ Awareness Training Matrix</p> <p>Sydney Water, Drinking Water Management Manual (BMIS0213)</p> <p>Sydney Water, Drinking Water Management Policy (BMIS0213.13)</p> <p>Sydney Water, Drinking Water Product Improvement Plan (1009538 2018-19)</p> <p>Sydney Water, Drinking Water Product Specifications (IMS0152.01)</p> <p>Sydney Water, Drinking WQ awareness training Civil Induction, 2019</p> <p>Sydney Water, DWMS & DWQEMP Refresher 2019, 2019</p> <p>Sydney Water, DWQ Event Management (WPIMS5228)</p> <p>Sydney Water, DWQMS Training attendance sheet Woronora 2019, 19-Jun-19</p> <p>Sydney Water, Email: out informing updated DW Policy, 12-Aug-19</p> <p>Sydney Water, Email: Response to IPART Audit, 17-Sep-19</p>		

Sydney Water, Email: *SWIRL notification INC 24308 E. coli detection Beacon Hill reservoir*, 9-Jan-19

Sydney Water, Email: *Transmittal of 1 Oct OL Reports for 2017-18*, 27-Sep-18

Sydney Water, *Final 2018 Report Catchment to Tap Mid-term review* (791708)

Sydney Water, *Final Afternoon Session - Day 1 Drinking Water Further Evidence Request*, 2019

Sydney Water, *Final Morning Session - Day 1 Drinking Water Further Evidence Request*, 2019

Sydney Water, Flyer course outline WQ Awareness training

Sydney Water, *Gradlink WQ training*, May-19

Sydney Water, *HACH 2100 Series Portable Turbidimeter - Calibration and Maintenance* (D0001552 V1), 14-Nov-19

Sydney Water, HACH Turbidity Meter calibration records (FS090.01 (v6))

Sydney Water, IMS Monthly Report, 3-Jun-19

Sydney Water, *Integrated Management System Review 2017-18*, 2017-18

Sydney Water, Item 3.2 Drinking Water Quality Update Final, 19-Feb-19

Sydney Water, JOG paper - Item 7.1 Nepean DWQMP Audit, 19-Aug-19

Sydney Water, List of completed audits 2018-19, 2018-19

Sydney Water, Macarthur DWQMS Audit Report FINAL, v3 (8-May-19)

Sydney Water, *Managing Water Quality Customer Complaints* (WOQ5162)

Sydney Water, Maximo - *Civ Dirty Water Alert Detail* (300519)

Sydney Water, Maximo - *Civ Dirty Water Alert Details*, 4-Nov-19

Sydney Water, *Minutes and Actions - 2018-19 Drinking and Recycled Water Management Review*, 25-Jun-19

Sydney Water, *Minutes and Actions - Management of Critical Control Points (CCPS) at WFPs* (INC-24225), 15-May-19

Sydney Water, Monitoring Design & Reporting Routine Reporting Schedule (MPMS0090.02 (v2))

Sydney Water, Monthly Operational Report, Jun-19

Sydney Water, *MOU with Fair Trading* (BCS0364), 8-Jun-12

Sydney Water, *Network Water Quality Risk Assessment Report Potts, Illawarra & Woronora Final*, 15-Apr-19

Sydney Water, NOM RD projects research map 2019

Sydney Water, Operating Licence Annual Reporting (D0000058), 28-Jun-19

Sydney Water, *Operational Risk Assessment Workshop SOP* (D0000799)

Sydney Water, PD - Process Controller, 26-Apr-18

Sydney Water, PD - Process Engineer, 14-May-18

Sydney Water, PD - Senior Process Engineer, 14-May-18

Sydney Water, PD - Water Quality Scientist, 8-Oct-18

Sydney Water, Pip Bain Induction Meeting, 24-Aug-18

Sydney Water, *Procedure for Capping, Swabbing, Flushing and Testing for New Water Mains* (SPIMS5027.04 (Final)), 19-May-19

Sydney Water, Record: *E. coli Investigation Report Beacon Hill Res* (WS0265)

Sydney Water, *Records Management* (SDIMS0017)

Sydney Water, *Request - NOM characterisation Nepean - Extension of monitoring* (DRCADHOC40)

Sydney Water, Risk and Hazard Library (RevD), 11-Feb-19

Sydney Water, Screenshot - iConnect - Policies tab showing Drinking Water Management Policy availability

Sydney Water, SDO Development Roster 1-11, 31-Oct-18

Sydney Water, SWIRL INC-24225 Power Outage Nepean WFP, 31-Dec-19

Sydney Water, Sydney Water Operational Procedures

Sydney Water, Tasks 3 and 4 Chloramine Analyser Report Final, Apr-19

Sydney Water, Technical Specification - Civil (CPDMS0023 (v8), 15-Aug-19

Sydney Water, Treatment Water Monthly Water Performance Report (Process and Product), Jun-19

Sydney Water, Trial of Online Turbidity Meters Final, Jan-18

Sydney Water, Triggers, Notification and Action for Adverse WQ Results (WPIMS5274)

Sydney Water, *Woronora Training Matrix* (Woronora Training Matrix)

Sydney Water, *Woronora WFP - Tool Box Meeting Minutes*, 11-Jul-18

Sydney Water, *Woronora WQ Risk Register* (v5), May-19

Sydney Water, *WQ Training Attendance sheet FST*, 29-Mar-19

Sydney Water, *Wyuna WFP's Drinking Water Quality Management Plan* (MAN-5308)

UNSW, Agreement: *ARC Linkage Projects Collaborative Research Agreement* (LP160100620)

UNSW, Fact Sheet: *Adapting catchment monitoring and potable water treatment to climate changes*

UNSW, Minutes: *Management Meeting Minutes - Final*

UNSW, Research Plan: *Xiaoran (Daisy) Chu Oxidation and NOM Removal Research Plan*

UNSW, Schedule: *ARC NOM Project 2018 Schedule*, 9-Mar-18

UQ, Certificate: QMRA Course - ASM Mohiuddin, 27-May-19
 UQ, IWES - Best Practice Drinking Water Quality Management - Kieran Frigo 15-Feb-19
 Veolia, Appendix 3 - Woronora Alarms for SCADA, CCP and OCP (MAN-7591)
 Veolia, *CCP OCP Exceedance Response Plan* (MAN-7591)
 Veolia, Operational Risk Assessment Workshop with SWC, 2-May-19
 Veolia, Veolia - List of Operational Procedures - Wyuna docs
 Veolia, Veolia Calibration log sheets, 17-Jun-19
 Veolia, *Veolia Risk Management Procedure* (PRO-263-3)
 Veolia, *Woronora WFP - Early Warning Notification (Water Quality)* (20122018)
 Veolia, Woronora Daily Lab Sheet, 28-May-19
 Veolia, *Woronora Early Warning Report for SWC*, 13-Jun-18
 Veolia, Woronora VAMS Record WO Annual Turbidity, 2019
 Veolia, Wyuna - *Reporting of Water Quality Incidents and Security Breaches* (WIS-5347), 7-Feb-19
 Veolia, Wyuna - *Responsibilities Matrix* (TEM-5276)
 Veolia, Wyuna - *Strategic and Tactical Asset Management* (MAN-5450)
 Veolia, Wyuna - *Unloading and Recording Bulk Chemical Deliveries* (WIS-5404)
 Veolia, *Wyuna Contract - SHEQ Audit Report*, Mar-19
 Veolia, *Wyuna Water - Operational Management Plan* (MAN - 5453)
 Veolia, *Wyuna WFP's Drinking Water Quality Management Plan* (MAN - 5308)
 Woronora Delivery System Process Flow Diagrams (1008859)
Woronora PFD Field, Verified 31.7.19
Woronora SCADA daily report, 7-Jun-19

Summary of reasons for Grade

Sydney Water was assessed as being Compliant (with minor shortcoming) for this clause. The evidence demonstrates that Sydney Water is implementing its DWQMS overall, except for elements 4 and 10 where some activities were not fully implemented as per the documents under the DWQMS.

One of the requirements under element 4 is to undertake regular calibrations of the HACH 2100 Portable Turbidimeter at the frequency stated in the related work instruction. However, the calibration records did not demonstrate that the calibrations were undertaken at the stated frequency. Under element 10, one of the requirements is to report on cross-connection inspections monthly as a KPI in Customer Delivery reports as per the *Drinking Water Product Specifications* (IMS0152.01). However, this reporting has not been undertaken.

It is considered that these shortcomings are minor. For Element 4, the calibration records show that calibrations were not taken at the stated frequency. However, verification testing is also undertaken by NATA accredited labs for turbidity in the drinking water supplied, providing a backup to the results of operational testing undertaken using the HACH 2100 Portable Turbidimeter. The additional testing by the laboratory provide assurance for the portable turbidimeter test results and quality of drinking water supplied. For element 10, overall Sydney Water is undertaking KPI reporting for other performance indicators as per the *Drinking Water Product Specifications*. Sydney Water indicated that it engages with NSW Health on its cross-connection programs and will review the *Drinking Water Products Specifications* to ensure currency of the cross-connection reporting target.

The minor shortcomings do not affect water quality or public health and safety.

Discussion and Notes

In order to meet the obligation of this clause Sydney Water must implement activities as specified in the DWQMS. Compliance has therefore been discussed in relation to each of the 12 elements of the DWQMS.

Based on the evidence provided and stakeholder feedback it appears that NSW Health are satisfied that Sydney Water has considered water quality and public health risks under the Operating Licence and MoU during the audit period.

Element 1

The requirement is to implement and undertake activities as specified in the DWQMS for element 1. The evidence demonstrates implementation as per the DWQMS. It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for element 1.

The evidence provided shows that:

- The *Drinking Water Management Policy* is an active document. Any change or new revision is communicated to staff through:
 - automated email notification of relevant business areas (evidence provided)
 - Sydney Water internal intranet (evidence provided)
 - physical display at relevant sites – WFP including BOOT plants (checked onsite at Woronora)
 - policy is distributed to BOOT plants when new version is produced.
- For Woronora WFP:
 - new employees are made aware of the policies when being inducted at site level and during the water quality awareness training sessions run by Sydney Water.
 - emails from Sydney Water on DWQMP updates are followed by toolbox talks.

- Regulatory requirements are monitored and kept up to date. The *Compliance Accountability Register* is maintained to cover all Sydney Water regulatory requirements. Legislative updates are prepared by the Corporate Compliance team and an update of any changes to legislation is sent fortnightly to relevant staff.
- In relation to public health and the environment NSW Health and the EPA are the main stakeholders. As identified in the MOUs, quarterly JOG and SLG meetings are held to facilitate relevant water quality discussions.

Element 2

The requirement is to implement and undertake activities as specified in the DWQMS for element 2. The evidence demonstrates implementation as per the DWQMS. It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for element 2.

The evidence provided shows that:

- There is a current PFD for Woronora WFP.
- A 'live' flow diagram of the Woronora water supply system was available through SCADA and IICATS.
- The Woronora WFP PFD is stored in Veolia's Business Management System and is reviewed annually.
- For the Woronora WFP (Veolia) - there was a briefing paper prepared which included long-term data analysis, NSW Health were invited to the risk workshop and they participated, and a risk workshop report was produced.
- The Woronora WFP risk register (Excel spreadsheet) was provided. The uncertainty scoring table needs to be reviewed as some of the information for 'confident' and 'uncertain' seems to be swapped around (refer to **OFI-SWC-2019-06**). It is not clear if uncertainty was assessed for each row.
- The networks water quality risk assessment for Woronora, Illawarra and Potts Hill (Excel spreadsheet) was provided. Risk ID 22 in the risk register does not have an Improvement Action identified even though the risk without controls is 'high' and the risk assessment is 'uncertain'. An Improvement Action is however identified for this risk in the respective risk assessment report.
- For the risk registers provided, some cells within the registers were empty. All cells should have text/data or should be marked with 'NA' (where relevant) to indicate that discussions had been undertaken (refer to **OFI-SWC-2019-07**).

Element 3

The requirement is to implement and undertake activities as specified in the DWQMS for element 3. The evidence demonstrates implementation as per the DWQMS. It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for element 3.

The evidence provided shows that:

- Preventive and control measures are identified in the risk assessment registers and in KnowRisk.
- CCP limits are incorporated into SCADA (Woronora WFP).
- The limits in main SCADA reflect the documentation for Woronora WFP. There is a backup SCADA also, where the HH (high high) alarm for filtered water turbidity at 0.45 NTU did not have a 10 s delay as per the documentation. This is more conservative in terms of time delay, the backup SCADA value is different from the documentation and the main SCADA. It is noted that the SCADA upgrade was only partially commissioned during the audit period. However, it will be useful to ensure that there is a process to periodically check that the limits and time delays between the main SCADA, backup SCADA and documentation are consistent (refer to **OFI-SWC-2019-06**).
- The filter shuts down on breach of the CCP filtered water turbidity limit. Filter 7 was tested as simulation for shutdown on breach of HH limit.
- The supernatant return flow rate is not monitored to ensure that it is <10% of raw water inflow. The reuse of waste streams such as spent backwash water and supernatant from clarifier sludge increases the risk of pathogens passing through the WFP. Such recycled water must be carefully managed to minimise the impact on the performance of the WFP. The flow rate of return streams to the head of the WFP should have a limit of <10% of inflow (*Good Practice Guide to the Operation of Drinking Water Supply Systems for the Management of Microbial Risk*, Water Research Australia Limited, 2015). Therefore, it will be useful to monitor and restrict the supernatant return flow rate to provide a multi-barrier approach to pathogen source control (refer to **OFI-SWC-2019-06**).
- Jar testing is undertaken on raw water samples to guide adjustments to the dose rates of the chemicals added during the treatment processes. The jar testing records were sighted for the Woronora WFP. The quality of raw water is generally good and stable hence does not require regular jar tests to be undertaken. The last jar testing was undertaken in 2016.
- No CCPs were exceeded during the audit period (Q4 Report to NSW Health) hence no corrective action in response to CCP limit exceedances occurred during the audit period.
- Reservoir inspections were undertaken (Heathcote reservoir records were sighted as evidence).
- Sydney Water's backflow prevention program is being improved (*Backflow Containment – Issues Paper sighted*). NSW Fair Trading also plays a role in backflow prevention being the regulator for on-site plumbing and drainage work and licensed plumbers in NSW. There is an MoU between Sydney Water and Fair Trading (dated June 2012). As part of the backflow program improvements being undertaken by Sydney Water, a review of the MoU for currency should be undertaken since it was established more than seven (7) years ago (refer to **OFI-SWC-2019-08**).

Element 4

The requirement is to implement and undertake activities as specified in the DWQMS for element 4. The evidence demonstrates that the DWQMS was not fully implemented for element 4. The work instruction for the calibration of the HACH Portable Turbidimeter requires regular calibrations to ensure reliability of data. The work instruction, WS0001 (now updated to D0001552), required the portable turbidimeter to be calibrated every 3 months, which was not undertaken. It is considered that this shortcoming is minor.

The calibration records show that calibrations were being undertaken, but it could not be verified that these were undertaken every 3 months, especially with the empty columns for '3 Monthly Calibration' and 'Authorised'. However, verification testing is also undertaken by NATA accredited labs for turbidity in the drinking water supplied, providing a backup to the

results of operational testing undertaken using the HACH 2100 Portable Turbidimeter. The additional testing by the labs provide assurance for the portable turbidimeter test results and quality of drinking water supplied. Hence, the shortcoming does not affect water quality, public health and safety.

The evidence provided shows that:

- There are procedures for processes and activities (a list of procedures was provided from Sydney Water and Veolia for Woronora).
- There is a *Drinking Water Quality Operational Monitoring Plan*. The Monitoring Plan, examples of control charts and the work instruction to produce these were provided as evidence.
- Automated emails are sent to key staff as early warning (automated email notification from AMD's Actions Database was provided for *E. coli* at Beacon Hill Reservoir on 09-01-2019).
- A daily report is also automatically generated to manage chloramination systems. It reports on chlorine, ammoniacal nitrogen, nitrite, nitrate and chlorine to ammonia ratios. Results are reported for samples that have been tested for ammoniacal nitrogen (an example report was provided – nitrogen and chlorine ammonia notification reports).
- An example from Veolia WFP for early warning report to Sydney Water was provided (plant trip due to power surge).
- Appropriate actions are undertaken as part of response and investigation. Examples were given for a break of a 450mm water main in Neville St Smithfield (Report – *450mm wm break 150 Neville St Smithfield WO#77151152* and *Maximo screenshot 450mm main break Neville St Smithfield WO77151152*) and for possible contamination of a 100mm water main during a break repair at Strathfield (SWIRL INC22180).
- Instrument calibration records were sighted at the Woronora WFP.
- The work instruction, WS0001 - *Calibration and Maintenance of HACH 2100P Portable Turbidimeter*, was provided as part of the audit evidence. It stated that the turbidimeter should be recalibrated every 3 months. The calibration records were provided for this. The calibration records have empty cells for the '3 Monthly Calibration' column and the 'Authorised' column is also largely empty. While it appears that calibration is being undertaken, the record keeping needs to be improved to demonstrate that the required calibrations are undertaken at the specified frequency as per the procedure (refer to **REC-SWC-2019-02**). Following the audit, the work instruction has been updated and a new document number (D0001552) has been assigned, as all the water quality documents are currently being reviewed and being allocated new numbers. The calibration record, Appendix A, of the procedure has also been updated.
- Flow calibration records and maintenance work are stored in VAMS records (VAMS was seen onsite, example of calibration of turbidity analyser was provided).
- Example of a chemical (aqua ammonia) docket delivery to the Woronora WFP was provided.

Element 5

The requirement is to implement and undertake activities as specified in the DWQMS for element 5. The evidence demonstrates implementation as per the DWQMS. It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for element 5.

The evidence provided shows that:

- Sydney Water has a *Drinking Water Quality Compliance Monitoring Plan*.
- Verification data is stored in Sydney Water's BI system, this was viewed onsite.
- Data for Woronora WFP (Veolia) is stored in the online data management system (Veolia's ODMs), this was viewed onsite.
- There were 27 samples collected/month for the Woronora delivery system based on a check of *E. coli* results for June 19. This was consistent with the Compliance Monitoring Plan.
- Complaints and responses are recorded in Sydney Water's CMS. Complaint information is reviewed monthly (June 2019 example was provided).
- Water Quality Scientists are responsible for managing water quality complaints. Area Water Quality Scientists are developed through a dedicated program that involves hands on training and a competency-based program run alongside experienced Water Quality Scientists (as per procedure *Development and Succession Planning for Area Water Quality Scientist*). Reviews of their performance are documented to improve their understanding and performance.
- Non-conformances in relation to water quality grab sampling data analysed by the laboratory are reported through daily exception reports. An example of an automated email notification for Beacon Hill Reservoir *E. coli* detection was provided.
- The Customer Sentiment Monitor also seeks feedback on consumer satisfaction across a number of Sydney Water products and services.

Element 6

The requirement is to implement and undertake activities as specified in the DWQMS for element 6. The evidence demonstrates implementation as per the DWQMS. It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for element 6.

The evidence provided shows that:

- There is a current contact list, D0001088 *Water Quality Management Contacts*.
- Sydney Water records water quality incidents and hazards in SWIRL (Sydney Water Incident Reporting and Learnings), which was viewed onsite. NSW Health has access to this application and receives updates when an incident or hazard is entered.
- There were no declared water quality exceptions in 2018-19. There were a number of notifications and incidents that were reported to NSW Health through SWIRL as per WPIMS5228 DWQEMP.
- An example of an incident notified to NSW Health was provided for the Nepean power outage due to a storm. Sydney Water notified NSW Health verbally and entered it into SWIRL. The notification was also included in the second

quarterly Water Quality Monitoring Reports to Health and discussed in the February 19 JOG meeting (evidence was provided).

- Training on the DWQEMP is provided to all required staff, including BOOT plants (evidence for the Woronora WFP training attendance sheet was provided).
- The Tripartite exercise between Sydney Water, WaterNSW, and NSW Health was scheduled to be held in April 2019 but was then deferred to March 2020, in agreement with the stakeholders (including NSW Health).

Element 7

The requirement is to implement and undertake activities as specified in the DWQMS for element 7. The evidence demonstrates implementation as per the DWQMS. It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for element 7.

The evidence provided shows that:

- Training was provided to key staff in 2018/19, including Water Quality Awareness training (various training records provided), Bush Fire Awareness training and Incident Control Management training.
- A DWQMS and DWQEMP refresher presentation was provided to the plants (Woronora WFP attendance sheet was provided)
- Sydney Water staff also attended external training, e.g. IWES training (Best Practice Drinking Water Quality Management), IXOM Chemical Training and Quantitative Microbial Risk Assessment for Water Safety Management
- The Water Quality Team runs an in-house water quality training and awareness course.
- New starters at WFP's complete training and requirements as set out in the new starters training list. There is also a Competency Development Program.
- Woronora WFP operators have the WIOA certificates, an example was sighted onsite
- The performance of the BOOT plants by Sydney Water is monitored in monthly performance meetings, operational interface meetings and is part of contract performance and management. The performance and water quality trends of all Sydney Water plants are reported as part of the Production report. Any exceedances or plant issues are discussed in monthly water production meeting and operational interface meeting. The *Monthly Operational Report – June 19* was sighted.
- The process for contractor performance management is documented in WTOC0014 - *Woronora WFP Contract Payment Procedure*.

Element 8

The requirement is to implement and undertake activities as specified in the DWQMS for element 8. The evidence demonstrates implementation as per the DWQMS. It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for element 8.

The evidence provided shows that:

- Sydney Water has an overarching policy on community and stakeholder engagement.
- Community involvement is delivered through the following approaches:
 - informative content across a range of communications channels e.g. Sydney Water website, social media channels (Facebook, Twitter), print, radio and TV broadcast media, publications, education programs, community events.
 - a community involvement program which includes education, community sponsorships and proactive engagement through community events. These programs are supported through Sydney Water digital and social media channels.
 - ongoing customer research including quarterly Customer Sentiment Monitor and annual Customer Relationship Study.
 - Customer Council (quarterly) - engagement with a wide variety of peak organisations that represent the interests of customers.
 - Business Customer Forum - engages with peak organisations and customers that represent the interests of business, industrial and commercial groups.
 - Service Faults Tracking System.
 - Business customer specific issues addressed via Customer Relationship Managers.
- Customers can get information on drinking water quality via:
 - phoning the contact centre
 - email
 - social media
 - CMS
 - Waterwrap newsletter with customer bills
 - Daily Drinking Water Quality report
 - Quarterly Drinking Water report
 - Your Water - summarises Quarterly report
 - Resources on the Sydney Water website
 - Sydney Water's Annual Report.

Element 9

The requirement is to implement and undertake activities as specified in the DWQMS for element 9. The evidence demonstrates implementation as per the DWQMS. It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for element 9.

The evidence provided shows that:

- Sydney Water has undertaken R&D projects over the audit period. Examples of documents that demonstrate Sydney Water's research in 2018-19 were sighted.

- R&D projects (such as NOM) were identified through risk assessment and past incidents).
- A copy of the Research & Innovation Portfolio Monthly Status Report, which summarises monthly reporting of all the projects to the Head of Customer Strategy and Planning was provided as evidence.

Element 10

The requirement is to implement and undertake activities as specified in the DWQMS for element 10. The evidence demonstrates that the DWQMS was not fully implemented for element 10. The *Drinking Water Product Specifications* (IMS0152.01), under the DWQMS, requires reporting on cross-connection inspections monthly in Customer Delivery reports. This has not been undertaken.

It is considered that this shortcoming is minor as overall reporting is undertaken on the other KPIs as per the *Drinking Water Product Specifications*. The minor shortcoming does not affect water quality, public health and safety.

The evidence provided shows that:

- There are relevant manuals, documents, procedures and work instructions which document the DWQMS.
- IMS, BI, SWIRL and COMPASS were viewed onsite.
- Document reviews are monitored, the IMS monthly report (June 19) was provided as an example.
- There is a routine reporting schedule (MPMS0090.02 Version 2) for the various internal and external reports produced for drinking water, recycled water, wastewater and environment.
- Sydney Water has established internal KPI performance reporting within the *Drinking Water Product Specifications* (IMS0152.01). One of the targets on System Integrity for cross-connection management is stated as “100% of new recycled water properties flow tested and 20% of new recycled water properties visually inspected for cross-connections in residential recycled water areas”. This has not been reported in monthly Customer Delivery reports (e.g. July 2019 was sighted). It should be ensured that all reporting is undertaken as outlined in the *Drinking Water Product Specifications*, which forms part of the DWQMS, and to ensure adherence to this reporting requirement a review of the *Drinking Water Product Specifications* (IMS0152.01) on internal KPI reporting may be necessary (refer to **REC-SWC-2019-03**). Also, refer to the discussion for Element 3 on sub-clause 2.2.1 regarding cross connections.
- An annual report is produced for consumers and published on Sydney Water’s website.

Element 11

The requirement is to implement and undertake activities as specified in the DWQMS for element 11. The evidence demonstrates implementation as per the DWQMS. It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for element 11.

The evidence provided shows that:

- Long-term analysis of drinking water quality is performed by Sydney Water, each quarter (quarterly report provided) and during the risk assessment process (Woronora WFP briefing paper provided).
- There were several internal audits carried out during the audit report, list of completed audits in 2018-19 was provided.
- Two drinking water plant audits were conducted in 2018-19 (Nepean WFP and Macarthur WFP), audit reports were sighted. The final audit reports were also provided to NSW Health and discussed in quarterly JOG meetings.
- Sydney Water system assurance audit includes all 9 WFPs, including BOOT plants. The report for the Macarthur WFP audit carried out in April 2019 was sighted.
- BOOT plants also conduct their own internal audits. For Veolia, the most recent internal audit carried out in March 2019 by two in-house staff and one external auditor (water quality) was provided.

Element 12

The requirement is to implement and undertake activities as specified in the DWQMS for element 12. The evidence demonstrates implementation as per the DWQMS. It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for element 12.

The evidence provided shows that:

- The Annual Management Review was held on 25 June 2019 (meeting minutes were provided). Due to restructuring several staff were acting in executive positions.
- The *2018-19 Drinking Water Product Improvement Plan* was provided. A dashboard has been created in the Improvement Plan to provide summary of all improvement actions and the current status.
- The Improvement Plan is presented to NSW Health during quarterly JOG meeting and outstanding and completed actions are discussed.

Recommendations

The following recommendations are made in respect of this obligation:

- **REC-SWC-2019-02:** By 30 June 2020, ensure calibration records associated with the work instruction, *HACH 2100 Series Portable Turbidimeter - Calibration and Maintenance*, are appropriately maintained to demonstrate that the required calibrations are undertaken at the specified frequency as per the work instruction.
- **REC-SWC-2019-03:** By 30 June 2020, ensure internal KPI reporting outlined in the *Drinking Water Product Specifications* (IMS0152.01) is undertaken as required. A review of the target criteria for cross-connection management in the *Drinking Water Product Specifications* (IMS0152.01) is to be undertaken to ensure that new and established residential property cross-connection rates are at a level that prevents unacceptable exposure (nominally 1/1000 houses). Appropriate monitoring of the targets must be established. This review must be undertaken in consultation with NSW Health.

Opportunities for Improvement


The following opportunities for improvement are made in respect of this obligation:

- **OFI-SWC-2019-06:** Sydney Water should discuss with Veolia (and other BOOT operators as applicable) and ensure that:
 - The uncertainty scoring table used is accurate. The uncertainty scoring table in the Woronora WFP risk register needs to be reviewed as some of the information for 'confident' and 'uncertain' seems to be swapped around.
 - There is a process to periodically check that the limits and time delays between the main SCADA, backup SCADA and documentation are consistent.
 - The supernatant return flow rate is monitored and restricted to ensure that it is <10% of raw water inflow. This will contribute towards a multi-barrier approach for pathogen source control and water quality risk management.
- **OFI-SWC-2019-07:** Include a requirement in the *Operational Risk Assessment SOP* that in the risk assessment register every cell should have text/data or be marked with 'NA' or have a comment (as relevant) to indicate that discussions had been undertaken during the risk review workshop.
- **OFI-SWC-2019-08:** Review the MoU between Sydney Water and NSW Fair Trading (established in June 2012) as part of the backflow program improvements.

Supplemental Information

No supplemental information is provided in respect of this obligation.

2.2.4. Recycled Water (2.2.1 & 2.2.2)

Clause	Requirement	Compliance Grade
2.2.1	<p>Sydney Water must maintain a Management System that is consistent with the Australian Guidelines for Water Recycling, except to the extent that NSW Health specifies otherwise (the Recycled Water Quality Management System (RWQMS)).</p> <p><i>[Note: It is expected that the RWQMS will be consistent with the Australian Guidelines for Water Recycling (AGWR), including the Framework for Management of Recycled Water Quality and Use. However, where NSW Health considers it appropriate, the application of the Australian Guidelines for Water Recycling may be amended or added to, to take account of Sydney Water's circumstances and/or Recycled Water quality policy and practices within New South Wales.]</i></p>	 <p>Compliant (minor shortcomings)</p>
Risk	Without a comprehensive RWQMS, there is a high risk that Sydney Water may not be able to effectively manage water quality and protect public health and the environment.	Target for Compliance Evidence that a RWQMS, consistent with the 12 elements of the framework for the management of recycled water quality and use, as specified in the AGWR, has been developed.
Obligation	Sydney Water has an obligation to develop a RWQMS that manages risks to water quality that may impact upon public health and the environment. The RWQMS should be current and systematically reduce risks to an acceptable level through appropriate controls. The scope of the RWQMS must include all recycled water schemes bound by Sydney Water's <i>Operating Licence 2015 – 2020</i> .	
Evidence Sighted	<p>Briefing paper and Presentation - Wollongong Stage 1 and 2 WRP HIDRA Workshop (549237)</p> <p>CMS-Maximo - Customer Complaint Monthly Report June 2019, Jun-19</p> <p>Contra Shear Technology, Validation Report for Wollongong UV Process, 10-Sep-07</p> <p>EPA, EPA SW Joint Officer Group Meeting Minutes and Actions, 13-Jun-19</p> <p>E-Training Package - Recycled Water Quality Event Management Plan</p> <p>E-Training Package - RWQMP - Wollongong Stage 1</p> <p>E-Training Package - RWQMP - Wollongong Stage 2</p> <p>Example of EKAMS exceedance and notification to stakeholders, 21-Jun-19</p> <p>Interruption and restoration of recycled water supply procedure (Interruption and restoration of recycled water supply procedure)</p> <p>IPART, IPART - Sydney Water Reporting Manual - Operating Licence 2015-2020, Aug-17</p> <p>NSW Health, Joint Office Group Meeting Minutes (1001047), 18-Feb-19</p> <p>Process Flow Diagram - Wollongong Stage 1 WRP (791442)</p> <p>Process Flow Diagram - Wollongong Stage 2 WRP (791443)</p> <p>Recycled Water Product Specifications (D0000076)</p> <p>Risk Assessment Register - Wollongong Stage 1 WRP, 23-Mar-16</p> <p>Risk Assessment Register - Wollongong Stage 2 WRP, 23-Mar-16</p> <p>SCADA Screenshot - CCP monitoring Wollongong Stage 1</p> <p>SCADA screenshot - CCP monitoring Wollongong Stage 2</p> <p>SCADA Screenshot - Sample of Wollongong CCP, interlocks and alarm</p> <p>Sydney Water, 2018-19 Recycled Water Product Improvement Plan (1009540), 2018-19</p> <p>Sydney Water, A Guide to Checking for Cross Connection in Dual Reticulation Schemes (WOQ5162.03), 6-Sep-17</p> <p>Sydney Water, Agenda - Recycled Water Forum - Q2 2019 (1000938), 2-May-19</p> <p>Sydney Water, Annual Recycled Water Quality Compliance and Performance Report 2017-18 Final, 1-Sep-18</p> <p>Sydney Water, Approved List of Chemicals (D0000643), 16-Aug-17</p> <p>Sydney Water, Assurance and Monitoring (Audits and Inspections) (SDIMS0010)</p> <p>Sydney Water, Briefing paper and Presentation - Wollongong Stage 1 and 2 WRP HIDRA Workshop (549237), 23-Mar-16</p> <p>Sydney Water, Business Resilience Manual (D0000504), 9-Jan-19</p> <p>Sydney Water, CD Dashboard Report (Group Executive team) - June 2019, Jul-19</p> <p>Sydney Water, Commissioning Recycled Water Schemes (RW0007), 20-Feb-18</p> <p>Sydney Water, Competency assessment - Pip Bain - AWQS, 24-Aug-18</p> <p>Sydney Water, Compliance Accountability Register (ICONN_UD_770397), 2019</p> <p>Sydney Water, Creation of Process Flow Diagrams WI (D0000685)</p>	

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Sydney Water, *Development Program for Customer Water Quality Scientist* (PBP0001), 2-Jul-19

Sydney Water, *Document Management* (SDIMS0008), Mar-19

Sydney Water, *DWQ Event Management* (WPIMS5228), 1-Nov-18

Sydney Water, *Emergency Management Procedure* (D0000507), 10-Jan-19

Sydney Water, *EPA Annual Returns Reporting Procedure* (PAMWP0003), 1-Sep-18

Sydney Water, *Gerrigong Gerroa Recycled Water Risk Assessment Report* (598845), Apr-17

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Sydney Water, *Incident Management Procedure* (D0000506), 22-Jan-19

Sydney Water, *Investigation Management of Cross Connection* (WNS0034), 2-Mar-18

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Sydney Water, *Management Review* (SDIMS0012), Mar-19

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Sydney Water, *MD&R Annual Reporting to EPA and IPART* (DOC0327), 4-Feb-19

Sydney Water, *Minutes and actions - Recycled Water Forum - Q2 2019* (1000939), 2-May-19

Sydney Water, *MoU with EPA* (SWEMS0172), Jun-19

Sydney Water, *MoU with Fair Trading* (BCS0364), 8-Jun-12

Sydney Water, *MoU with NSW Health* (WPIMS5015), 28-Jun-19

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Sydney Water, *Networks Performance Report June 2019*, 1-Jul-19

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Sydney Water, *Notification of Plant Recycled Water Production Interruptions* (WRHQ5050), 22-May-17

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Sydney Water, *Penrith WRP Recycled Water Risk Assessment Report* (598846), Apr-17

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Sydney Water, *Production Capability Development Guide - Product Quality*, 14-May-18

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Sydney Water, *Recycled Water Quality Event Management Plan* (WR5271), 20-Jun-19

Sydney Water, *Recycled Water Treatment Detailed Verification Monitoring for Pathogen Reduction* (PAMWP0001), 19-Jun-19

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Sydney Water, *Risk Assessment Register - Wollongong Stage 1 WRP*, 19-Nov-14

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 Wollongong WRP, *Wollongong WRP - Tertiary Filtration UPG* (D0000192), 23-Aug-16

Summary of Reasons for Grade

This clause has been awarded the grade of Compliant (minor shortcomings). The reasons for this grade are that it was considered the risk assessments for the Wollongong Stage 1 and Stage 2 schemes were too high level to meaningfully manage risks. Also, that a greater level of monitoring is required to ensure cross-connection controls are effective.

Hazardous events were very high level and the control measures listed were generic. However, the supporting documentation, such as monitoring and operational procedures were very detailed. The site visit supported the fact that on the ground risks are well managed. The risk assessment is due to be reviewed in 2020, which is a process of continual improvement and there is a new risk assessment process being rolled out. It was considered on this evidence that the shortcoming did not affect water quality, public health or the environment. This scheme provides water for industrial and irrigation purposes.

It was considered that there should be an increased level of monitoring of cross-connection controls. After the initial plumbing inspection for new properties inspections of residential properties only occur in response to customer complaints. It is recommended in the AGWR that monitoring of residential properties are undertaken to determine that cross-connection controls are working. It was considered that Sydney Water should investigate the effectiveness of current controls. The grade of compliant minor shortcomings was given as there were no cross-connections reported during the audit period and the recycled water quality requirements, as required by the AGWR, account for up to 1/1000 houses to be cross-connected.

Discussion and Notes

In order to meet the obligation of this clause Sydney Water must develop a RWQMS in according with the 12 elements of the AGWR framework for management of recycled water quality and use. Compliance has therefore been discussed in relation to each of the elements.

Sydney Water has a recycled water management system, which is comprised of a number of key documents:

- *Recycled Water Management Manual (RWMM)*
- *Recycled Water Management Policy*
- *Recycled Water Product Specifications*
- *Scheme RWQMP*
- *Recycled Water Product Improvement Plan*

Based on the evidence provided and stakeholder feedback from NSW Health it appears that NSW Health have not specified any amendment or addition to the requirements of the AGWR.

Element 1

It is considered that sufficient evidence has been provided to demonstrate that the requirements have been met for Element 1. Details of the evidence is below.

Responsible use of Recycled Water

Under the AGWR Sydney Water must demonstrate that it has engaged with stakeholders with responsibilities for protection of public and environmental health. In addition, it must ensure that the design management and regulation of the recycled water schemes is undertaken by agencies and operators with sufficient experience. This has been demonstrated as follows:

- The RWMM describes how Sydney Water engages with stakeholders in Sections 1.1 and 1.3.
- Stakeholders relevant to recycled water are listed in Table 1-1 (pp. 17-18).
- Sydney Water holds MoUs with NSW Health and EPA. The MoUs specify the engagement process with these key stakeholders. A JOG and SLG have been formed.
- Sydney Water is a government owned utility and is deemed to have sufficient experience to operate treatment plants for recycled water.
- Section 1.3 of each scheme RWQMP also refers to stakeholder engagement, with reference to scheme-specific stakeholders. More detailed stakeholder management details are in the Stakeholder Management Procedure (SDIMS0006).

Regulatory and Formal Requirements

Under the AGWR Sydney Water must identify regulatory and formal requirements for the governance of the recycled water schemes. Compliance has been demonstrated by the following:

- The governance model of the recycled water schemes is illustrated in section 7.1 of the RWMM.
- Regulatory and formal requirements are summarised in section 1.2 of the RWMM.
- The *Compliance Accountability Register*, which details the acts with a high significance for Sydney Water, accountability and compliance measures.
- Scheme roles and responsibilities are identified in section 1 of the scheme specific RWQMPs.

Partnerships and Engagement of Stakeholders

Under the AGWR Sydney Water must identify all agencies with responsibilities for water resources and recycled water, for partnerships where required to ensure effective management of recycled water, identify stakeholders of the scheme, ensure the users understand responsibilities and commitment is documented.

- Section 1.3 RWMM identifies agencies with responsibilities for water resources and recycled water as well as partnerships and engagement.
- MoUs have been developed with key stakeholders, including NSW Health, EPA, NSW Office of Fair Trading and Fire & Rescue NSW.
- The *Stakeholder Management Procedure* presents a high-level process for managing regulators and other stakeholders.
- Customers are managed through customer agreements, except residential customers which are subject to the Customer Contract. Both documents detail the end-user's responsibilities for the safe use of recycled water.

Recycled Water Policy

Under the AGWR a recycled water policy is required to be endorsed by senior managers. Sydney Water has a policy dated June 2018 approved by the Acting Managing Director.

Element 2

It is considered that the evidence provided demonstrates that Element 2 has not been fully met, however, the shortcomings are minor and do not affect public health or the environment. There are requirements of the risk assessment, as specified in the AGWR, that are not demonstrated, such as uncertainty and not all the modes of failure are considered in the hazardous events. Based on site inspection at the Wollongong WRP risks were being well managed and it is considered that the documentation does not fully reflect the level of activities on the ground.

Intended Uses and Sources of Recycled Water

Under the AGWR Sydney Water must identify the recycled water source water, intended uses (including inadvertent and unauthorised uses), routes of exposure and receiving environments. This is demonstrated as follows:

- Section 2.1.1 of the RWQMP includes details of the source water and Appendix C summaries 10 years of influent water quality data.
- Uses of recycled water are detailed in section 2.1.2 of the RWQMPs and shown on the flow diagrams in Section 3. Unintentional uses of recycled water, including cross-connections, were considered in section 2.1.5.
- Routes of exposure, environmental risk and log removal values for pathogens, based on exposure, are considered in sections 2.1.3 to section 2.1.6 of the RWQMP.
- The risk assessment briefing papers also contain details of uses and treatment requirements.
- Appendix 14 of the *Recycled Water Product Specifications* has the specification for Wollongong WRP (site visited). It identifies the intended use of the recycled water as Industrial (dust suppression); municipal irrigation; fire fighting. Log Reduction Values (LRV) have been specified based on Table 3.7 of the AGWR, based on firefighting as it has the highest LRV requirements of any end use.

Recycled Water System Analysis

The AGWR requires the recycled water system to be analysed, information regarding the scheme to be assembled, a flow diagram developed and an appropriate team is put together to assess the information.

- Section 2.2 of the RWQMPs contains high-level information about the schemes. Detailed information is in the UPG, the Tertiary Filtration UPG was provided as a sample.
- The risk registers identify the team that reviewed the risks. This was deemed to be appropriate.
- Flow diagrams:
 - Wollongong schemes 1 & 2 have flow diagrams in the RWQMPs. Section 2.2 has a treatment plant flow diagram and section 2.2.2 (Stage 1 only) has a distribution schematic.
 - Section 3.2 has a diagram of unit operations that shows the process flows and the location of CCPs.
 - The risk assessment briefing paper contained an additional flow diagram, for both schemes, which showed the whole scheme, including customers, uses (intentional and unintentional) and receiving environment.
 - The recycled water scheme diagrams (section 3.2 of the RWQMPs) have been field verified.

Chemical dosing is not shown on the flow diagram, although engineering process and instrumentation diagrams are available. The flow diagrams will be updated using the new *Work instruction for Creation of Process Flow Diagram* (D0000685) at the next risk assessment.

Assessment of Water Quality Data

Under the AGWR Sydney Water is required to assess both influent and effluent from the treatment plants and recycled water supplied to the users, this was addressed as follows:

- Each of the RWQMPs contains a summary of 10 years of influent and effluent data in Appendix C.
- Appendix C also has long-term trending of relevant influent and effluent parameters.

Hazard Identification and Risk Assessment

Under the AGWR the risk assessment process is required to have a defined approach, be periodically reviewed, identify hazards and hazardous events, estimate the levels of risk, determine significant risks and evaluate sources of uncertainty.

Sydney Water have a defined approach, existing risk assessments were undertaken using the superseded *Operational Risk Assessment Technical Requirement* (QMAF00021). However, future risk assessments will be undertaken using the updated *Sydney Water Risk Management Process* (QMAF0081) under the *Risk Management Framework* (QMAF0080). It should be noted that these procedures do not include all the requirements of the AGWR, such as inherent risk. These are documented through the template used for recycled water risk assessments.

Risk assessments are periodically reviewed, every 4 years, none fell within the audit period. This is documented in the BMIS document management system.

The risk registers identify hazardous events and consequence, which includes human and environmental hazards. The hazardous events identified in the Wollongong Stage 1 risk assessment are at a high-level and lack the granularity that is required to manage the risks. The AGWR states that “*all potential hazards and hazardous events should be included in the assessment for each component of the recycled water system*”. Table 2.4 of the AGWR contains examples of hazardous events and these include chemical dosing failures, inadequate filter operation and backwash recycling. (refer to **REC-SWC-2019-04**)

The level of risk is identified in the risk registers before and after control measures have been applied. Unintended uses of recycled water have been considered in the risk assessment process, however, uncertainty has not been considered.

Element 3

It is considered that the evidence provided shows that the requirements have not been fully met. However, sufficient evidence has been provided to demonstrate that any shortcomings are minor. It is considered that the current lack of monitoring for residential cross-connections does not meet the intent of the AGWR, which specifies in relation to cross-connections that ‘*monitoring is required to ensure that compliance with restrictions is maintained*’.

Preventive Measures and Multiple Barriers

Under the AGWR existing preventive measures are to be identified for significant hazardous events and residual risk is to be calculated. Additional preventive measures are to be identified where the mitigated risk is not acceptable and preventive measures are to be documented.

Section 3.1 of the RWQMP details the presence of multiple barriers. The LRV assessment in section 9 of the RWQMP demonstrates that for pathogens there are multiple barriers in place. The LRV for viruses could not be verified through sampling, due to a lack of cross-connections. There were no cross-connections identified within the audit period. Sydney Water’s current control are to ensure that new connections are inspected prior to a recycled water meter being installed. Recycled water customer complaints are given a high priority and respond within an hour and if there is potential for a cross connection water quality tests are undertaken. The AGWR states that ‘*End-use restriction relies on user compliance. Experience indicates that monitoring is required to ensure that compliance with restrictions is maintained, and this should be considered when implementing such measures.*’. Currently monitoring is undertaken of the industrial and irrigation customers but there is no

planned monitoring of the residential customers. This is considered to be a gap in the management of this hazardous event. (refer to **REC-SWC-2019-03**)

Critical Control Points

Under the AGWR preventive measures are to be assessed to identify CCPs, mechanisms are to be established for control and these are to be documented with critical limits and target criteria.

The *Recycled Water Product Specification* collates CCPs for all recycled water schemes. The *Recycled Water Product Specification* identifies the methodology used to identify CCPs.

Section 3.2 of the individual scheme RWQMPs also refers to how CCPs and OCPs are identified and specifies scheme specific CCPs and OCPs and controls. Critical limits are documented in the *Recycled Water Product Specification* and Table 3-1 of the RWQMPs. Target criteria are documented in the *Recycled Water Plant Workflow SOP Logsheet*.

Element 4

Sufficient evidence has been provided to demonstrate that the requirements of this element have been met.

Operational Procedures

Under the AGWR all operational procedures are to be documented for the whole recycled water scheme and documented into an operations manual.

Operational processes for unit operations are documented in Sydney Water's UPG. A sample of UPGs were provided as evidence. Plant daily checks are documented in the *Operating and Monitoring Workflow*, this is operationalised using the *Operating and Monitoring Workflow Logsheet*. Procedures are stored and managed through the BMIS.

Operational Monitoring

Under the AGWR Sydney Water is to develop monitoring protocols for operational performance of the recycled water supply system and documentation of monitoring protocols into a monitoring plan

Operational monitoring is documented in the *Operating and Monitoring Workflow SOP* and associated log sheet and in the *Production Common Laboratory Methods and Analysis Manual* and supplemental schedule in the *Illawarra Hub Sampling and Analysis* procedure. Between these documents they detail the online, field and laboratory operational monitoring.

Operational Corrections

Under the AGWR Sydney Water is to establish and document procedures for corrective action where operational parameters are not met and a rapid communication system for unexpected events is present.

The RWQMP for each scheme details the critical limits and actions taken if they are triggered, which in most instances is an interlock preventing the production of recycled water.

The *Operating and Monitoring Workflow SOP* and associated log sheet detail the target criteria for operational monitoring. The UPGs are a reference document that are used to troubleshoot issues that arise with a process.

Data from the daily lab analysis is entered into SCADA Central, which flags values outside of the acceptable range.

Section 4.3 of the RWQMP refers to the *Recycled Water Quality Event Management Plan*, this document explains how issues are escalated if operational monitoring/observations identify an issue. The *Wollongong WRP Incident Response Manual* identifies the immediate action to be taken in the event of an onsite incident. This includes CCP failure and non-compliant water quality.

Equipment Capability and Maintenance

Under the AGWR Sydney Water is to ensure that equipment performs adequately and provides sufficient flexibility and process control. A program is to be established for regular inspection and maintenance.

Preventive maintenance is scheduled and work orders are set-up in Sydney Water's MAXIMO system (proprietary asset management system). A spreadsheet showing a range of completed MAXIMO work orders for Calibration and Maintenance were provided as a sample of jobs programmed through MAXIMO. Calibrations are scheduled according to the *Wollongong WRP – Calibration Schedule* and there is an SOP detailing how to perform calibrations, *Calibration of Recycled Water Plant Wet Rack Online Instrumentation*.

Materials and Chemicals

Under the AGWR Sydney water must ensure that approved chemicals and materials are used and that there is a documented process.

Sydney Water maintains the *Approved List of Chemicals in Sydney Water and Change Management Process SAP* which can be used for all WRPs. This list of approved chemicals also includes approved suppliers and technical specification for each chemical. There are site-specific SOPs for receiving bulk chemicals which confirms that chemicals are checked and verified according to the order and confirms that correct chemicals are delivered. The Wollongong Hub SOP *Unloading Chemical from Tankers* was provided as evidence. Aspects of this procedure were reviewed during the site visits.

Chemical supply contracts state that chemicals not conforming with the Sydney Water Specification will not be accepted, which is in the *Approved List of Chemicals Procedure*.

Materials are managed through specifications, such as the *Manual for Selection and Application of Protective Coatings*.

Element 5

Sufficient evidence has been provided to demonstrate that the requirements of this element have been met.

Recycled Water Quality Monitoring

The requirement of the AGWR is to determine the characteristics to be monitored and the points and frequency that they will be monitored.

Monitoring characteristics are outlined in section 5 of the relevant scheme RWQMP and in a site specific monitoring plan in Appendix D. Recycled monitoring for all schemes is documented in the *Recycled Water Quality Compliance & Operational*

Monitoring Plan. This plan outlines the characteristics, sampling location and frequency of monitoring. It fulfils the requirements of the AGWR.

Application Site and Receiving Environment Monitoring

The AGWR require that the characteristics to be monitored and the points at which monitoring will be undertaken are identified. Section 5.2 of the Wollongong RWQMPs states the following:

- Stage 1 – recycled water is used in the industrial process and does not directly interact with the environment, no environmental monitoring is undertaken.
- Stage 2 – the recycled water users are responsible for the environmental discharge on their respective sites and for any required monitoring.

The *Recycled Water Customer Meeting Forms* include raising awareness of end-user responsibilities for environmental monitoring, including monitoring soil and groundwater impacts. It would be beneficial to have a feedback loop to determine that some form of assessment is taking place and there is no deterioration of the environment. (refer to **OFI-SWC-2019-09**)

Documentation and Reliability

The AGWR require a sampling plan is to be developed that includes each characteristic, ensuring monitoring data is representative and reliable.

The monitoring plan is documented in the *Recycled Water Compliance & Monitoring Plan*. Section 12.3 to 12.6 of the plan detail the data management, quality management, systems and certification and quality control procedures. This plan is reviewed annually. These processes fulfil the requirements of the AGWR.

Satisfaction of Users of Recycled Water

The AGWR requires the establishment of an inquiry and response program for users of recycled water, including appropriate training of people responsible for the program.

The overarching procedure for managing customer complaints is outlined in the *Customer Complaint Procedure*. Recycled water quality complaints from residential customers are received through the Sydney Water Customer Hub. Sydney Water has a CMS, which all complaints are entered. Water quality complaints are managed using the *Managing Water Quality Customer Complaints Work Instruction*. Area Water Quality Scientists are responsible for responding to recycled water quality complaints for residential schemes, whom are trained in the management of water quality complaints.

Business customers that have entered into Recycled Water Supply Agreements are assigned a Business Customer Representative (BCR) as a relationship manager whom they can contact directly with any inquiries. BCRs visit customers every 6 months to review compliance with customer agreements. This is a two-way exchange and customer satisfaction is also gauged. BCR are trained through a nationally recognised qualification, Diploma of Water Operations. Training is discussed more in Recommendation 2016-17-6.

It is considered that these two approaches meet the requirements for both residential and commercial customers.

Short-term Evaluation of Results

The AGWR requires a procedure to be established for the short-term review of monitoring data and satisfaction of recycled water users. Mechanisms for reporting should also be developed.

Sydney Water produces a number of monthly and quarterly reports for internal and external stakeholders (e.g. NSW Health, recycled water customers) including recycled water verification monitoring results.

A number of the reports produced are listed in section 10.2 of the RWQMP as well as in section 12 of the *Monitoring Plan Recycled Water Quality: Compliance & Operational*. Details of regulatory reports to external stakeholders are prescribed in MoU agreements and the *Sydney Water Reporting Manual*.

All monthly performance reports and NSW Health quarterly licence grab sample reports are stored in SWIM. These reports are reviewed and discussed at the quarterly JOG meetings.

A scorecard is produced monthly to track performance of the drinking water and recycled water systems, the *Network Performance Report*.

Complaint information is also reviewed monthly in the *Customer Complaint Monthly Report*. No recycled water complaints were received in the audit period.

It is considered that the reporting undertaken fulfils the requirements for the evaluation of results, customer satisfaction and reporting.

Corrective Responses

The AGWR requires a documented procedure is to be developed for corrective responses to non-conformance or feedback from users of recycled water. A rapid communication system is required for unexpected events.

Non-conformances in relation to water quality grab sampling data are reported through the Effluent Knowledge and Management System (EKAMS). Daily exception notifications are sent to relevant internal stakeholders via EKAMS actions databases. Immediate phone notification by the laboratory is undertaken for any positive *Cryptosporidium*, *Giardia* or virus results, as per section 12 of the *Recycled Water Compliance & Monitoring Plan*.

The Wollongong WRP Production Team has regular process meetings which documents operational issues and actions to be undertaken. Process meeting minutes for the Illawarra Hub Weekly Planning and Performance Meeting (regional operations meeting) were provided.

The *Wollongong WRP Incident Response Manual* identifies the immediate action to be taken in the event of an onsite incident. This includes details of actions to be taken in response to non-conforming recycled water.

The *Managing Water Quality Customer Complaints* work instruction details the actions to be undertaken in response to the recycled water customer complaint.

Element 6

Sydney Water has provided enough evidence to demonstrate that this requirement has been met.

Communications

The AGWR requires a communication protocols with the involvement of relevant agencies are to be defined and a contact list of agencies and people prepared. In addition, a public and media communication strategy is to be developed.

The MoU with NSW Health explains the high-level considerations for Sydney Water's communication with NSW Health on any events in relation to Sydney Water's systems or services. NSW Health are to be notified immediately of any event with public health significance.

The *Recycled Water Quality Event Management Plan (RWQEMP)* outlines the communication protocols with all relevant agencies in relation to recycled water events / incidents. It details responses to foreseeable events, general and scheme specific, in appendices 1 and 2.

Contact details are in the *Recycled Water Notification Contact List*, which contains all the relevant internal and external contacts, names, numbers and emails.

The document *Notification of Plant Recycled Water Production Interruptions* describes the communication and notification process to the recycled water customer during supply interruptions due to planned or unplanned shutdown and events / incidents. In the case of residential customers, it is the Networks Team and BCRs that are contacted not actual customers.

Media releases are undertaken in liaison with NSW Health and the responsibility for these communications are specified in the RWQEMP as being the Media & External Communications Team.

Incident Response Protocols

The AGWR requires potential incidents and emergencies are defined, procedures and response plans are documented, employees are trained, emergency response plans are tested and that any incidents or emergencies are investigated and protocols as revised, as necessary.

Sydney Water has procedures for incidents and another for emergencies, emergencies are defined as being a higher level of incident where disruptions have the potential to impact the functioning of the community. These are the *Incident Management Procedure* and the *Emergency Management Procedure*. These procedures set the framework, site specific incidents and actions to be taken are in the RWQEMP, which has specific information on the events and incidents managed by the recycled water schemes. The RWQEMP has triggers for reporting events and incidents to NSW Health and any escalation that may be required.

In addition to the immediate incident and emergency management procedures, Sydney Water also have a *Business Resilience Manual*, which outlines the initiatives to support business resilience principles.

The *Incident Management Procedure* and the *Emergency Management Procedure* both specify the training and the testing of protocols through exercises. The frequency of these are left to the individual plants, this is up to quarterly, the last exercise at Wollongong was undertaken on 1/2/19. It may be beneficial to state the minimum frequency that *Incident Management Procedure* and *Emergency Management Procedure* should to be tested in the procedure itself. (refer to **OFI-SWC-2019-10**)

Element 7

It is considered in this instance Sydney Water have provided sufficient evidence that this requirement has been met.

Operator, Contractor and User Awareness and Involvement

Under the AGWR Sydney Water is required to develop a mechanism and communication procedures to increase operator, contractor and end-user awareness of and participation in recycled water quality management and environmental protection.

Sydney Water raises awareness of the consequence of system failure through scheme risk assessment workshops with treatment operations (managers, operators, process / technical staff etc), contractors and recycled water customers. Sydney Water completed all the fourteen scheme risk assessment workshops in 2015-16 and 2016-17. The Wollongong recycled water scheme risk assessments are due to revised in 2020.

Sydney Water also achieves awareness through site induction programs, internal forums (including Recycled Water Forum), Sydney Water's intranet, internal social media and emails. The Recycled Water Forum discusses relevant recycled water issues and is a way of disseminating information from the JOG meetings to those responsible for recycled water.

Sydney Water has Compass e-learning training packages for each scheme's RWQMP, which provides information about the scheme and raises awareness of system failure. Each scheme e-learning training module covers the 12-element management framework of the RWQMP. There is also a Compass e-learning course for the RWQEMP, which outlines the awareness and actions during any recycled water quality events and incidents. The e-learning training packages were provided as evidence.

Business customers that have entered into Recycled Water Supply Agreements are assigned a BCR. Site visits, twice a year, are also used as a means to raise awareness with irrigation and industrial users.

The *New Production Officer Training Checklist* provides details of the training required for new Production Officers and this includes training on water quality guidelines, which is to be completed in the first week.

Operator, Contractor and End-user Training

Under the AGWR Sydney Water must ensure that operators, contractors and end users maintain the appropriate experience and qualifications, identify training needs and document training and maintain records of training sessions.

Qualifications, skills, and experience requirements are listed on staff position descriptions. This is part of the recruitment process and is there to ensure appropriately skilled staff are employed. On the job training is covered by the *New Production Officer Training Schedule*. However, this process only covers recently appointed staff.

Records of e-learning training through Compass were provided as evidence of training. Compass is also used to track training to ensure the appropriate training is maintained. This system was viewed onsite.

Industrial and irrigation end users are managed through recycled water agreements. These agreements state that users must be inducted in the safe use of recycled water. End-users must then also provide an annual statutory declaration stating that user controls have been implemented, which includes the training requirements.

Evidence was provided that contractors undertake appropriate training to work on Sydney Water's assets. Ventia undertake maintenance activities on Sydney Water's recycled and drinking water assets. Ventia provided a training matrix used to identify the appropriate training for each position under the contract. Training is managed by Ventia using an online application called VisRes Pro.

Element 8

It is considered that Sydney Water demonstrated compliance with this requirement.

Consultation with Users of Recycled Water and the Community

Under the AGWR Sydney Water is required to assess the requirements for effective involvement of the users and community and develop a consultation strategy.

Section 8 of the RWMM identifies Sydney Water's strategy for consultation with business and residential recycled water customers.

Information aiming to communicate with and educate the community is published on the Sydney Water website, included at times in Waterwrap (customer newsletter with bills), and in fact sheets on the appropriate end use of recycled water.

Sydney Water has long-running education programs to build awareness of recycled water, particularly using the Water Recycling Education Centre at St Marys WRP. These programs target schools (secondary), universities and TAFE, stakeholder and community groups and professional delegations. Educational resources have been developed and are available on Sydney Water's website.

Communication and Education

Under the AGWR it is required that Sydney Water develop a two-way communication program to inform users of recycled water and promote awareness, provide information on benefits and impacts of unauthorised use.

Community consultation is undertaken via public discussion documents, public forums, through the groups like the Customer Council and BCRs.

Recycled water customers (business) are involved in the risk assessment for the specific scheme, which includes an assessment of unauthorised uses.

New customers are sent an onboarding letter to advise them that they are supplied with recycled water and details of the do's and don'ts for recycled water use.

Element 9

Sydney Water has provided sufficient evidence to demonstrate that this requirement has been met.

Validation Process

Under the AGWR processes are to be validated to ensure they control hazards effectively and these are to be revalidated if variations in conditions occur.

Section 9.2 of the RWMM has a general description of how equipment and infrastructure are validated. The RWQMPs have scheme specific validation information. Sydney Water is undertaking verification validation (pathogen indicator monitoring program) for treatment processes to verify that the LRVs required for each scheme are being achieved. The process for undertaking this is detailed in the *Recycled Water Treatment Detailed Verification Monitoring for Pathogen Reduction* (PAMWP0001) procedure. The procedure specifies that detailed verification monitoring will be undertaken at each WRP on a four-year rolling cycle, to ensure that every plant is reviewed within the five-year Operating Licence cycle.

Design of Equipment

Under the AGWR Sydney Water must validate the design of new equipment and infrastructure.

Equipment is selected based on its ability to meet a Functional Design Specification, which are in the *Technical Design Specification Part 1 – Civil Works* or *Technical Design Specification Part 2 – Mechanical Works*. Commissioning of the equipment is detailed in the Technical Specifications.

Investigative Studies and Research Monitoring

Under the AGWR Sydney Water is required to establish programs to increase the understanding of the recycled water supply system and use this information to improve the management of the recycled water.

Section 9.3 of the RWMM has high-level information on recycled water research. Sydney Water has a dedicated research function within the Corporate Strategy Group. The *Research and Development Program* sets out Sydney Water's current research portfolio, *Sydney Water's Research & Innovation Strategy Towards 2020*. These are at a strategic level and cover the whole business. These high-level strategies don't always have measures for success, however the objectives of the research are understood.

Scheme specific improvement actions are identified through recycled water risk assessment workshops and during the review of the RWQMP, these are added to the *Recycled Water Product Improvement Register*.

Element 10

Sufficient evidence has been provided to demonstrate that this requirement has been met.

Management of Documents and Records

Under the AGWR Sydney Water is required to document information pertinent to all aspects of recycled water quality management and have a document control system. Documents are also to be reviewed periodically and records management system is also required.

Documentation related to delivering recycled water to customers is managed through a certified Integrated Management System (ISO90001, ISO14001, AS/NZ4801, ISO17025). Version control is managed by the rules built into the database. There are documented procedures for managing documents and records under the IMS. Records are managed as per Sydney Water's records management requirements. Key records are maintained in systems such as MAXIMO, SWIRL, SWIM, Compass and SCADA Central. Records related to specific areas are maintained locally as well (e.g. plant log sheets). The documentation is controlled through the BMIS database with specified review periods. Automated emails are sent to document owners as review reminders. Documents are reviewed at specified frequencies or when there are significant changes to the process. The currency of documents is monitored against agreed KPIs and reported monthly to stakeholders and management in the Customer Delivery Dashboard Report.

Reporting

Under the AGWR procedures are to be established for internal and external reporting and an annual report is to be produced. Section 10.2 of the RWMM specifies the internal reporting concepts and 10.3 details the external regulatory report that are required. Details of the internal reports are in the *Preparation of Recycled Water Quarterly Report Procedure*. For external reports there is the *IPART Reporting Manual, Preparation of Recycled Water Quarterly Reports Procedure* and the EPA Annual Return Reporting Procedure.

Element 11

Sufficient evidence has been provided to demonstrate that this requirement has been met.

Long Term Evaluation of Results

Under the AGWR long-term data is to be collected and evaluated to assess performance and identify problems and document and report results.

The long-term evaluation of recycled water quality is undertaken every 4 years as part of the risk assessment process. The statistical analysis of water quality data (10 years) is trended and checked against AGWR for microbiological and long-term values environmental risk. This analysis is presented in scheme risk assessment reports to inform the stakeholders and is included in the final risk assessment report. This information is incorporated into the next revision of the RWQMPs.

Long-term water quality analyses are also performed every quarter. They are reported on in the *Quarterly Recycled Water Quality Monitoring Report* for NSW Health. The report includes analyses involving a 12-month rolling window of data in addition to the relevant quarter's window of data.

Audit of Recycled Water Quality Management

Under the AGWR Sydney Water is to establish a process for internal and external audits and document and communicate the results.

External audits of the operating licence are undertaken annually (financial year) by IPART.

RWQMS audits are incorporated into the IMS audits. Audit related information is recorded in a database (BMIS Audit database). Audits are scheduled through the database and the reports resulting from the audits are also recorded in the same database. The *Assurance & Monitoring Procedure (Monitoring & Inspections)* details the process for internal audits. This procedure does not facilitate the usage of contract internal auditors, which are regularly used by Sydney Water (refer to **OFI-SWC-2019-05**). Improvement actions arising from audits are also raised in BMIS and completion of actions are managed through a workflow within the system (BMIS).

Element 12

Sufficient evidence has been provided to demonstrate that this requirement has been met.

Review by Senior Managers

Under the AGWR Sydney Water is required to have senior managers review the effectiveness of the management system and evaluate the need for change.

Section 12.1 of the RWMM references the Management Review Process, which includes the following:

- safety performance review
- customer perspective review
- IMS review for adequacy, suitability and effectiveness (risk, quality, safety, environment and user feedback)
- Water & Recycled Water process integrated review on performance (quality, risk, cost and customer satisfaction)
- wastewater process integrated review on performance (quality, risk, cost and customer satisfaction).

Recycled Water Quality Improvement Plan

Under the AGWR Sydney Water is to develop a water quality management improvement plan and the plan is to be communicated and implemented and the improvements monitored for effectiveness.

The *Product Management Improvement Framework* provides the detailed process to implement improvements and the *Recycled Water Product Improvement Plan* documents and tracks the improvements.

Progress in implementing the improvement plan is communicated through the Recycled Water Forums and the JOG and SLG meetings.

Recommendation

The following recommendation has been identified in respect of this obligation:

- **REC-SWC-2019-04:** The recycled water risk assessments need to be more detailed to ensure that they manage risks effectively. The following actions are to be undertaken:
 - All possible modes of failure are to be assessed through the identification of hazards and hazardous events, although these may be grouped.

- Specific actions or procedures are identified as preventive measures to ensure the measure is understood, communicated and auditable.
- Significant risks should be clearly identified, to ensure preventive measures are in place and prioritised accordingly.
- Areas of uncertainty are to be identified to ensure that there is continual improvement in the risk assessment process. These are to be implemented for the next revision of the Wollongong Stages 1 and 2 risk assessments prior to 31 March 2020.

Opportunities for Improvement

The following opportunities for improvement are made in respect of this obligation:

- **OFI-SWC-2019-09:** Consider implementing a feedback mechanism to ensure that end-user environmental monitoring is being undertaken and the application of recycled water to land is not having a detrimental effect. This could be through the customer statutory declaration or *Recycled Water Meeting Forms*.
- **OFI-SWC-2019-10:** It would be beneficial to state the minimum frequency that the *Incident Management Procedure* and *Emergency Management Procedure* are to be tested in the RWQMS documentation.
- **OFI-SWC-2019-11:** It would be beneficial to document target criteria for CCPs and OCPs in the RWQMPs. Currently they are only visible in the *Recycled Water Plant Workflow SOP Logsheet*.
- **OFI-SWC-2019-12:** It would be useful to develop a training needs matrix for staff and contractors to ensure that they have and maintain appropriate experience and qualifications. The matrix can be used as a Training Needs Analysis tool.

Supplemental Information


Sydney Water completed the risk assessment for all recycled water schemes in 2015-16 and 2016-17. Scheme risk registers are in the risk assessment reports and Appendix B of the relevant RWQMP. The following observations were made in relation to the risk assessment registers and risk assessment process:

- In Table 1-1 of the RWMM the NSW Office of Water has changed its name to the Department of Planning, Industry and Environment.
- The Wollongong WRP flow diagrams don't comply with the Work Instruction for *Creation of Process Flow Diagram*. This was developed after the last review of the flow diagram and will be implemented at the next review.

Target criteria are documented in the *Recycled Water Plant Workflow SOP Logsheet*. It may be worth considering including the target criteria for CCPs and OCPs in the scheme RWQMP. Each of these points has a normal operational range, it may be beneficial to have them clearly identified in scheme documentation. (refer to **OFI-SWC-2019-11**)

A minor discrepancy was observed between the *Wollongong WRP – Calibration Schedule* and the *Calibration of Recycled Water Plant Wet Rack Online Instrumentation*. Instrument ARC8112 is identified as measuring free chlorine in the former and total chlorine in the latter.

The employees are qualified and/or trained to undertake their roles. However, it will be useful to develop a training needs matrix for staff and contractors to ensure that they have and maintain appropriate experience and qualifications. The matrix can be used as a Training Needs Analysis tool. In addition, the matrix can visually, at a glance, identify individual skill levels and training gaps. (refer to **OFI-SWC-2019-12**)

Clause	Requirement	Compliance Grade
2.2.2	Sydney Water must ensure that the RWQMS is fully implemented and that all relevant activities are carried out in accordance with the RWQMS, and to the satisfaction of NSW Health.	 Compliant

Risk

If the RWQMS is not fully implemented, there is a high risk that Sydney Water may not be able to effectively manage water quality and protect public health and the environment.

Target for Compliance

Evidence that the RWQMS is fully implemented and that all relevant activities are carried out in accordance with the System, including to the satisfaction of NSW Health.

Obligation

Clause 2.2.1 of the licence required that Sydney Water have a RWQMS in accordance with the AGWR. In this clause Sydney Water is required to implement that management system and the activities specified to manage risks to water quality. In order to demonstrate that those actions are being undertaken records must be maintained.

Evidence Sighted

Annual Declaration, Wollongong Golf Club, 30 June 2019
 Bombo WRP (A0000471), 18-Jun-19
 CMS-Maximo - Customer Complaint Monthly Report June 2019, Jun-19
 EPA, EPA SW Joint Officer Group Meeting Minutes and Actions, 13-Jun-19
 Example of EKAMS exceedance and notification to stakeholders, 21-Jun-19
 HRL, 2018 Composite NaOCL HRL Report #18-1116-14, 20-Sep-18
 HRL, 2019 Wollongong NaOCL HRL Report #19-0273-11, 9-Feb-19
 iConnect Policies tab showing Recycled Water Management Policy available
 IMS Procedure Training
 IXOM, Certificate of Analysis - Ferric Chloride, May-19
 IXOM, Chemical delivery docket - Sodium Hypochlorite Wollongong IXOM, 17-May-19
 Legislative update April 2019, 26-Apr-19
 MAXIMO work orders for Calibration and Maintenance - Wollongong WRP
 NSW Health, Agenda JOG 20 May 2019 Final (1001073), 20-May-19
 NSW Health, JOG Meeting Minutes 20 May 2019 (1001050), 20-May-19
 Post Sept 18 - Rouse Hill brochure
 Post Sept 18 - Rouse Hill customer notification letter
 Pre Sept 18 - Rouse Hill brochure (Pre Sept 18 - Rouse Hill brochure)
 Pre Sept 18 - Rouse Hill letter (Pre Sept 18 - Rouse Hill letter)
 Process Flow Diagram - Wollongong Stage 1 WRP (791442)
 Process Flow Diagram - Wollongong Stage 2 WRP (791443)
 Recycled Water Customer Meeting Form, Wollongong Golf Club, 18/4/2019
 Recycled Water End-User Statutory Declarations
 Recycled Water Notification Contact List (WRHQ5050.01)
 Recycled Water Product Improvement Plan (1009540), 2018-19
 Risk Assessment Register - Wollongong Stage 1 WRP, 23-Mar-16
 Risk Assessment Register - Wollongong Stage 2 WRP, 23-Mar-16
 SCADA Screenshot - CCP monitoring Wollongong Stage 1
 SCADA Screenshot - CCP monitoring Wollongong Stage 2
 SCADA Screenshot - Sample of Wollongong CCP, interlocks and alarm
 Scenario Drill Attendance Sheet Wollongong, 1 Feb 19
 Sydney Water response to 2019 Audit Questionnaire
 Sydney Water, A Guide to Checking for Cross Connection in Dual Reticulation Schemes (WOQ5162.03), 6-Sep-17
 Sydney Water, Agenda - Recycled Water Forum - Q2 2019 (1000938), 2-May-19
 Sydney Water, Annual Recycled Water Quality Compliance and Performance Report 2017-18 Final, 1-Sep-18
 Sydney Water, Briefing Paper and Presentation - Wollongong Stage 1 and 2 WRP HIDRA Workshop (549237), 23-Mar-16
 Sydney Water, Calibration Log Sheet - Wollongong WRP - Free Chlorine, 2018-19
 Sydney Water, ChemScan Mini Low Ammonia Sensor Trial - Rouse Hill WRP
 Sydney Water, Competency assessment - Pip Bain - AWQS, 24-Aug-18
 Sydney Water, Complete workflow logsheet - Wollongong Liquids Stream - Nov 18, Nov-18
 Sydney Water, Completed workflow Log Sheet - Wollongong WRP - May 2019, May-19

Sydney Water, *Document Management* (SDIMS0008), Mar-19
 Sydney Water, *Email Evidence* (INC23067), 8-Aug-19
 Sydney Water, *Gerrigong Gerroa Recycled Water Risk Assessment Report* (598845), Apr-17
 Sydney Water, *Hub MOS meeting minutes - Wollongong WRP - 25 June 2019*, 25-Jun-19
 Sydney Water, *IMS Monthly Report*, 2-Jul-18
 Sydney Water, *Induction Water Quality Management*, 9-Apr-19
 Sydney Water, *Integrated Management System Review 2017-18*, 2017-18
 Sydney Water, *List of completed audits 2018-19*, 2018-19
 Sydney Water, *Managing Water Quality Customer Complaints* (WOQ5162 (v10))
 Sydney Water, *MAXIMO work orders for Calibration and Maintenance - Wollongong WRP*
 Sydney Water, *Minutes and Actions - 2018-19 Drinking and Recycled Water Management Review*, 25-Jun-19
 Sydney Water, *Minutes and actions - Recycled Water Forum - Q2 2019* (1000939), 2-May-19
 Sydney Water, *MoU with NSW Health* (WPIMS5015), Jul-16
 Sydney Water, *Networks Performance Report June 2019*, Jun-19
 Sydney Water, *Notification of Plant Recycled Water Production Interruptions* (WRHQ5050), 22-May-17
 Sydney Water, *Penrith WRP Recycled Water Risk Assessment Report* (598846), Apr-17
 Sydney Water, *Quarterly recycled water quality monitoring report for NSW Health Q3 2018-19* (984242), 31-Mar-19
 Sydney Water, *Records Management* (SDIMS0017), Aug-17
 Sydney Water, *Recycled Water Compliance & Operational Monitoring Plan 2018-19* (792384), 2018-19
 Sydney Water, *Recycled Water Management Policy* (BMIS0260.01), 21-Jun-18
 Sydney Water, *Recycled Water Qual and Mngmt Plan update - JOG Feb 2019*, Feb-19
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 Sydney Water, *Recycled Water Qual update - JOG August 2018*, Aug-18
 Sydney Water, *Recycled Water Quality Event Management Plan* (WR5271), 20-Jun-19
 Sydney Water, *Recycled Water Treatment Verification for Pathogen Reduction* (PAMWP0001), 19-Jun-19
 Sydney Water, *Risk Assessment Register - Wollongong Stage 1 WRP*, 23-Mar-16
 Sydney Water, *Risk Assessment Register - Wollongong Stage 2 WRP*, 23-Mar-16
 Sydney Water, *RWQMP - Wollongong Stage 1 WRP* (RW0002), 19-Feb-19
 Sydney Water, *RWQMP - Wollongong Stage 2 WRP* (WRHQ5052), 17-Jun-19
 Sydney Water, *Stakeholder Management* (SDIMS0006), Mar-18
 Sydney Water, *Sydney Water Annual Report 2017-2018*, 2017-18
 Sydney Water, *Training Records - site specific SOPs - Wollongong WRP*, 9-Nov-15
 Sydney Water, *Treatment Plants - Common Incident Response Manual* (D0001222), Mar-19
 Sydney Water, *Using recycled water around your home in the Rouse Hill area*, SW276 03/18
 Sydney Water, *Water Quality Update - JOG May 2019*, 20-May-19
 Sydney Water, *Wollongong Golf Club signed meeting from 2019*, 18-May-19
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 Sydney Water, *Wollongong Stage 1 Recycled Water - Monthly Performance Report 2018-19*
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 Sydney Water, *Wollongong WRP - Calibration of WRP Wet Rack Online Instrumentation SOP* (D0000176), 25-Sep-15
 Sydney Water, *Wollongong WRP - Recycled Water Plants - Operating and Monitoring Workflow* (D0000175), 17-Aug-17
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 The Centre for International Economics, *Customer-informed IPART submission (CIPA) Phase 1*, 30-Apr-18
 Training Records - *Compass (E-Learning) - Recycled Water Quality Event Management Plan*
 Training Records - *Compass (E-Learning) - RWQMP - Wollongong Stage 1 and Stage 2*
 Training Records *Compass (E-learning) - All RWQMPs and RWQEMP*
 UQ, *IWES course certificate - Recycled Water Management - Andrew Peters*, 13-Feb-19
 UQ, *IWES course certificate - Recycled Water Management - Stella Modyanto*, 13-Feb-19
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 Ventia, *Sydney Water VisRes Training Matrix*
 Ventia, *VisRes Screenshot*
 Wastewater and Recycled Water, *Recycled Water Notification Contact List* (WRHQ5050.01), 3-Jul-19
 Water and Recycled Water, *WQS Development Roster 1-11 2017 to 31 Oct 2018*, 31-Oct-17
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 Wollongong *Cryptosporidium & Giardia exceedance* (INC23067), 18-Sep-18

Summary of reasons for Grade

On examination of Sydney Water's implementation of its RWQMS it was considered that sufficient evidence had been provided to demonstrate that the required activities had been fully carried out. Based on the submission to the audit from NSW Health it was evident that they were satisfied with the Sydney Water's implementation of its RWQMS and progress in addressing previous recommendations.

Discussion and Notes

The AGWR details the Framework for Management of Recycled Water Quality and Use, which consists of 12 Elements, based on which Sydney Water has developed its RWQMS. This audit considers the compliance with each element of the framework as per Sydney Water's RWQMS.

Element 1

The requirement is to implement and undertake activities as specified in the RWMM and RWQMPs for element 1. It is considered that Sydney Water is implementing its requirements under Element 1.

Responsible use of Recycled Water

Sydney Water must demonstrate that it has engaged with stakeholders with responsibilities in protection of public and environmental health. In addition, Sydney Water must also ensure the design, management and regulation of the recycled water schemes is undertaken by agencies and operators with sufficient experience.

In relation to public health and the environment NSW Health and the EPA are the main stakeholders. As identified in the MOUs, quarterly JOG and SLG meetings are held to facilitate liaison.

Regulatory and Formal Requirements

Sydney Water must identify regulatory and formal requirements and the governance of the recycled water schemes.

The *Customer Accountability Register* details requirements under legislation, the register was last updated in 2019. Changes in regulation with a high significance are updated as they arise, minor changes are amended in the annual review. It was advised that changes in the regulatory environment are scanned every 2 weeks, a legislative update was provided as evidence.

Partnerships and Engagement of Stakeholders

Sydney Water must identify all agencies with responsibilities for water resources and recycled water, partnerships that are required to ensure effective management of recycled water, stakeholders of the scheme and that ensure the users understand responsibilities and commitment is documented

BCRs manage the agreements with business customers. Six monthly visits are undertaken to liaise with these customers, evidence of meetings with the Wollongong Golf course was provided. Details of risk assessments were provided that demonstrate communication and engagement with customers with agreements. Risk assessments are held every four years.

Industrial and irrigation customers must provide statutory declarations annually regarding the operation of their schemes, a sample for the Wollongong Golf Club was provided as well as a list of the others received during the audit period.

Recycled Water Policy

The current *Recycled Water Policy* is available through iConnect (Sydney Water's intranet) and is available publicly on the Sydney Water website.

Element 2

The requirement is to implement and undertake activities as specified in the RWMM and RWQMPs for element 2. It is considered that Sydney Water is implementing its requirements under Element 2.

Intended Uses and Sources of Recycled Water

This information is considered every four years as part of the risk assessment review. No risk assessments were undertaken in the audit period.

In NSW Health's submission to the audit they specifically mentioned cross-connections, and these are identified as an inadvertent use in the RWQMPs.

Recycled Water System Analysis

The flowcharts were last updated on 19/2/2019 and field verification was undertaken on 17/08/2018 for Wollongong.

The risk assessment process, which is undertaken every four years, reviews the system analysis and this is shown in the risk assessment briefing. Through the field visits it was considered that these accurately describe the scheme.

Assessment of Water Quality Data

Every four years the water quality trends are reviewed as part of the risk assessment process. 10 years of data is in Appendix C of the RWQMP, which was last updated for Wollongong in 2014-15. In the interim a monthly report is produced, *Wollongong Stage 1 Recycled Water - Monthly Performance Report* (a similar report is produced for Stage 2).

Hazard Identification and Risk Assessment

Scheme Risk Assessments are performed every four years, along with review of RWQMP, no risk assessment workshops were held in the audit period. The risk assessment of Wollongong was undertaken on 23/03/2016. It is intended that following risk assessments will use the KnowRisk software in addition to the spreadsheets. KnowRisk is the corporate risk assessment tool.

Element 3

The requirement is to implement and undertake activities as specified in the RWMM and RWQMPs for element 3. The requirements under this element were found to have been met.

Preventive Measures and Multiple Barriers

Preventive measures are detailed in the scheme risk assessments as 'Existing Control Measures'. NSW Health in their submission to the audit would like cross-connections and backflow to be reviewed.

The control measures for a cross-connection in the Sydney Water system includes "*SW flow testing and visual inspection on all properties prior to installation of the meter*". Controls for a residential cross-connection are reactive to customer complaints and to the control of external parties such as NSW Office of Fair Trading. This requirement was subject to a previous recommendation and is discussed in Recommendation 2018-03.

In relation to industrial and irrigation, customers are required to undertake annual cross-connection tests and have a backflow prevention device in accordance with relevant standards and codes. These were new requirements and in the case of Wollongong Golf Club imposed on 18 June 2019. Customers will be required to provide a statutory declaration that these requirements are being implemented when these are next due.

The Workflow Logsheets are used at the WRP to demonstrate that preventive measures are being implemented and the barriers in place are operational. A sample of these were reviewed to demonstrate compliance.

Critical Control Points

Critical limits are monitored using online instruments and SCADA. There were no critical limits triggered over the audit period. Critical limits in SCADA were checked to ensure consistency with the *Recycled Water Product Specification*. Whilst onsite the interlock for the free chlorine CCP was tested and it operated as specified. It was noted that operators could change critical limits in SCADA. This should be protected to prevent accidental change. (refer to **OFI-SWC-2019-13**)

Element 4

The requirement is to implement and undertake activities as specified in the RWMM and RWQMPs for element 4. The requirements under this element were found to have been met.

Operational Procedures

Records are maintained for the implementation of the *Process and Equipment Monitoring Procedure*:

- *Workflow Log Sheet– Wollongong WRP*
- *Workflow logsheet - Wollongong Liquids Stream*
- *Calibration Logsheets – Wollongong WRP*

Weekly meetings of the Production Team are held and meeting minutes are maintained, a sample was observed.

BMIS is used to store plant procedures, details of the SOPs for Wollongong were observed. Training is provided on new procedures, although outside of the audit period, an appointment for a training session for the Wollongong Production Officers on new IMS procedures was provided as evidence. Training included the following procedures:

- *EPIRMP (Emergency & Pollution Incident Response Management Plan)*
- *Treatment wide work instructions*
- *Plant specific work instructions*
- *Wollongong Process Specification*
- *Wollongong WRP Operations Manual*
- *Wollongong WRP Lab Manual*

Operational Monitoring

Operational monitoring undertaken by the operators is entered into SCADA Central. The system was observed and the data appeared to be consistent with requirements. SCADA trends were also viewed during the site audit. Samples are also collected and sent to the Sydney Water Laboratory. Production Officers take samples to support decision making and there were some gaps in the ammonia data due a lack of resources after a restructure in the Illawarra Hub (operational region). Minor issues after the restructure are currently being rectified by Sydney Water, ammonia samples are now being undertaken. See Supplemental Information for additional discussion on ammonia monitoring.

Online operational data is stored in Sydney Water's SCADA PDMS system (database).

Corrective Action

No CCPs failed to operate as required over the audit period. Whilst onsite SCADA trends were observed and the interlock for the free chlorine CCP was tested and it operated as specified.

Corrective actions due to observations and grab sample monitoring could be seen documented on the comments section of the Workflow Logs.

Equipment Capability and Maintenance

Calibration and maintenance records were provided as evidence:

- *MAXIMO Work orders example for Calibration and Maintenance – Wollongong WRP*
- *Calibration Logsheets – Wollongong WRP – Free Chlorine*

It was noted during the site inspection that instruments could be put into simulation mode (a state in SCADA where the online instrument reading is locked at a particular value) during instrument calibrations. There is a risk that a user may overlook turning off this mode, which would result in the online monitoring instrument not being able to provide alerts for out-of-specification water quality. (refer to **OFI-SWC-2019-14**)

Materials and Chemicals

Records were provided to support implementation of the *Wollongong WRP – Chemical Unloading SOP* and the *Approved List of Chemicals in Sydney Water and Change Management Process SAP*. The process was also confirmed during the site inspection and no issues were identified.

Materials are managed through specifications listed in section 4.5 of the RWMM. During site inspections no activities were observed where these specifications would apply. Based on observations, it appeared that materials being used were appropriate.

Element 5

The requirement is to implement and undertake activities as specified in the RWMM and RWQMPs for element 5. The requirements under this element were found to have been met.

Recycled Water Quality Monitoring

Sydney Water stores all the verification monitoring data generated by the laboratory in LIMS. Data is then uploaded to Sydney Water's BI System.

E. coli monitoring data for Wollongong for the audit period was reviewed and it showed that all the required samples were taken and that all results were within the specification.

Satisfaction of Users of Recycled Water

There were no complaints regarding the quality of recycled water over the audit period. Also, there were no cross-connection between the recycled and drinking water networks reported.

Short-term Evaluation of Results

Non-conforming results are emailed through the EKAMS system. An example of notifications was provided.

Sydney Water produces monthly and quarterly reports for internal and external stakeholders (e.g. NSW Health, Recycled Water Customers) for recycled water verification monitoring results. These reports provide the short-term evaluation of results.

Production Monthly Performance Reports for both Wollongong Stages 1 & 2 were observed. All monthly performance reports, and NSW Health quarterly licence grab sample reports are stored in SWIM. These reports are reviewed and discussed at the quarterly JOG meetings. A sample of JOG meeting minutes were reviewed.

The *Network Performance Report* is produced monthly. The main indicator in this report for recycled water is the amount of water used to top-up the schemes. This is an indirect way of monitoring recycled water performance. When the WRPs are out of specification, water is diverted to environmental discharge and potable water is supplied to customers (except for the Wollongong WRP Stage 1 where raw water is used). There is additional information in the report for the Rouse Hill dual reticulation scheme, as it is higher risk and has a more significant distribution system than the industrial and irrigation schemes.

Corrective Responses

Non-conformances in relation to water quality grab sampling data are reported through EKAMS. Daily exception notifications are sent to relevant internal stakeholders via EKAMS actions databases. This will trigger a corrective action if required.

During the site visit at Wollongong it could be seen that the operators were competent and understood the treatment processes. Weekly Production meetings are held to discuss issues that have arisen and actions are identified with due dates. The Illawarra Hub Weekly Planning and Performance Meeting Minutes were reviewed.

Element 6

The requirement is to implement and undertake activities as specified in the RWMM and RWQMPs for element 6. It is considered that Sydney Water met this requirement based on the evidence.

Communication

There were no declared Sydney Water incidents or emergencies at any of Sydney Water's WRPs in 2018/19.

There were five notifiable events that were reported in the SWIRL database. This is a database that is accessible by Sydney Water, Water NSW and NSW Health, which promotes transparency between organisations. There was a *Cryptosporidium* exceedance that occurred on 20/09/2018 at Wollongong WRP. Incident records (INC-23067) were reviewed to determine if incidents are registered, communicated and actioned as per requirements in the *Recycled Water Event Management Plan*. It was discussed that due to the process train at Wollongong false positive results are often returned. The deep bed filters are not adequate to remove *Cryptosporidium*, however it is deactivated by UV disinfection. The test method used for monitoring counts deactivated *Cryptosporidium* oocysts. This monitoring needs to be reviewed as it currently does not add value, possible options include:

- remove the monitoring from the plan
- change the method
- change the location.

(Refer to **OFI-SWC-2019-17**)

The *Recycled Water Notification Contacts List* contains the relevant contacts for incidents and emergencies and appears to be up to date.

Incident and Emergency Managing Protocols

For those reportable events that occurred during the audit period, based on the evidence supplied, protocols were followed. The SWIRL database was reviewed onsite.

Training in incident and emergency management is provided by Sydney Water. Training records for incident and emergency management and a Wollongong WRP incident scenario drill undertaken on 1 Feb 2019 were provided.

Element 7

The requirement is to implement and undertake activities as specified in the RWMM and RWQMPs for element 7. It is considered that Sydney Water met this requirement based on the evidence.

Operator, Contractor and User Awareness and Involvement

Sydney Water raises awareness of the consequence of system failure through scheme risk assessment workshops, this was confirmed by the workshop attendance sheets.

Agenda and minutes for the Recycled Water Forum were provided as evidence to demonstrate recycled water awareness training.

The managers, operators and network representatives have completed the online training on the RWQMP for Wollongong WRP stages 1 & 2 and the RWQEMP. Training records were provided.

BCRs are trained in scheme specific RWQMPs, records were provided. Irrigators and industrial recycled water users are visited every 6 months to ensure continued awareness and an onsite checklist is completed. Evidence was provided in the form of a checklist.

Operator, contractor and End-user Training

Qualifications, skills, and experience requirements are listed on staff position descriptions. Position descriptions and resumes of staff were provided as evidence.

Staff also receive external training on Recycled Water Management such as IWES courses. BCR require broad skills in the water industry to manage Recycled Water Supply Agreements on behalf of Sydney Water. These skills are outlined in their position descriptions. An example of the qualifications obtained were provided, including a TAFE Water Operations Certificate.

Area Water Quality Scientists and Production Officers undergo training in specific competencies. Details of the program were provided, although records of the program being implemented were not provided.

Evidence was provided to demonstrate that contractors are appropriately trained to work on Sydney Waters assets. Ventia undertakes maintenance activities on behalf of Sydney Water and a training matrix and screenshot of the training management software (VisRes) were provided.

Element 8

The requirement is to implement and undertake activities as specified in the RWMM and RWQMPs for element 8. It is considered that Sydney Water met this requirement based on the evidence.

Consultation with users of recycled water and the community

Sydney Water undertook a major customer engagement program in the 2018/2019 audit period, which supported the *Pricing Proposal 2020-24*. This engaged with customers, citizens and small and medium business through forums, discussion groups and an online survey.

Sydney Water stated that “*Customer Delivery Community Relations Portfolio in 2018/19 (planned work delivered by contractors), had 97,632 customer interactions – this included sending out notifications, customer meetings, complaints, correspondence and enquiries.*” This covers Sydney Water’s entire scope of operations and demonstrates a high-level of communication and consultation with customers.

Communication and education

Information aiming to communicate with and educate the community is published on the Sydney Water website on topics such as appropriate end use for residential customers, benefits of water reuse and recycling, extent of water recycling programs across the network (via irrigation, industrial and environmental re-use). This was accessible during the audit.

There are fact sheets for residential customers focusing on the benefits of using recycled water and on appropriate end uses. Fact sheets and web pages state the appropriate and inappropriate uses of recycled water. The *Using recycled water around your home in the Rouse Hill area* factsheet was accessed on the Sydney Water website and it details that recycled water can be used in gardens, toilets, car washing, ornamental ponds, firefighting and laundry. It also states that it cannot be used for drinking or cooking, bathing, swimming pools, playing in (sprinklers), cleaning inside the house or in evaporative coolers.

Sydney Water also sends out information to new customers who move into a residential recycled water area. A letter and an information brochure are sent out to make customers aware of what recycled water is and how it can be used.

Element 9

The requirement is to implement and undertake activities as specified in the RWMM and RWQMPs for element 9. It is considered that Sydney Water provided sufficient evidence to demonstrate that this requirement has been met.

Validation of Processes

Sydney Water has developed the generic process for LRV verification, *RW Treatment Verification for Pathogen Reduction* and a verification monitoring program for LRV for all schemes has been developed and agreed to with NSW Health to implement. Details of this validation is in the Wollongong WRP RWQMPs in section 9.

Validation for the Wollongong schemes is due to be reassessed in the 2019-20 financial year. Monitoring details for this validation were included in the *2018-19 Compliance and Operational Monitoring Plan*, it was stated that this was to allow for the cost of the monitoring to be determined so it can be included in the 2019-20 monitoring budget.

No changes have been made to the Wollongong scheme over the audit period, therefore no validation was required for new equipment or processes.

Design of Equipment

Equipment is designed/ acquired to meet the functional design specification. No changes were made to the sites considered, therefore no evidence was reviewed.

Investigative Studies and Research Monitoring

An example was provided of specific R&D, Sydney Water completed the trial of six (6) online UVT analysers, which was one of the improvement actions in the *Recycled Water Product Improvement Register*. The trial project validated and assessed the instruments accuracy, reliability and response time to process change. The trial identified the best online UVT instrument and it was then recommended for installation and commissioning at the WRPs.

Element 10

The requirement is to implement and undertake activities as specified in the RWMM and RWQMPs for element 10. It is considered that Sydney Water provided sufficient evidence to demonstrate that this requirement has been met.

Management of Documents and Records

The IMS was viewed onsite, including the version control, change request, review date, review frequency features. Key records are maintained in systems such as MAXIMO, SWIRL, SWIM, Compass, SCADA Central, which were viewed onsite. The currency of documents is monitored against agreed KPIs and reported monthly to stakeholders and management (examples were provided – *Customer Dashboard Report* and *Networks Performance Report* June 19).

Whilst onsite, although there are multiple systems for documents and records, staff could retrieve them effectively and the sample of procedures reviewed onsite were current.

Reporting

Monitoring performance of key processes criteria and regular reporting occurs at all levels. Sample reports reviewed were: *Network Performance Report*, *Production Performance Reports* and the *Group Executive Customer Dashboard Report*.

A number of quarterly reports are specified in the Health MoU and these are tabled at the JOG.

External compliance reports are specified by the *Sydney Water Reporting Manual*. An annual report is also produced for consumers and published on Sydney Water's website.

Element 11

The requirement is to implement and undertake activities as specified in the RWMM and RWQMPs for element 11. It is considered that Sydney Water provided sufficient evidence to demonstrate that this requirement has been met.

Long Term Evaluation of Results

The procedure for preparing the *Quarterly Recycled Water Quality Monitoring Report for NSW Health*, with data assessment, was provided. The procedure for compiling the report for NSW Health each quarter was provided. The water quality reports were also provided. These reports include analyses involving a 12-month rolling window of data in addition to the relevant quarter's data.

10 years' worth of influent and effluent data is assessed for the recycled water risk assessments that are undertaken every four years. This data is in the RWQMPs and was viewed for the Wollongong schemes.

Audit of Recycled Water Quality Management

RWQMS audits are incorporated into the IMS audits. All audit related information is recorded in a database (BMIS Audit database). Audits are scheduled through the database and the reports resulting from the audits are also recorded in the same database. Improvement actions arising from audits are also raised in BMIS and completion of actions are managed through a workflow within the system (BMIS), which was viewed onsite. Details are:

- audit register
- audit report entered into BMIS
- actions identified, assigned and delegated
- closed out
- long-term actions may be entered into the *Recycled water Product Improvement Plan*.

Audit frequency is currently set at one audit every three years. The list of completed audits was supplied in the evidence. This included one IMS audit at the Wollongong WRP.

Sydney Water has a number of recycled water supply agreements with business customers. Sydney Water's assigned BCR meet with these end users on a 6-monthly basis to confirm they are complying with the purchaser controls contained within their supply agreement. A checklist is completed with the end-user, however, this is not an audit.

Element 12

The requirement is to implement and undertake activities as specified in the RWMM and RWQMPs for element 12. It is considered that Sydney Water provided sufficient evidence to demonstrate that this requirement has been met.

Review by Senior Managers

The *Management Review Procedure* was provided. The annual management review occurred on 25 June 2019. The minutes and actions from the review were provided.

In addition, JOG and SLG meetings, DC dashboard reports to the Group Executive team and monthly water performance meetings provide a level oversight of recycled water activities by management.

Recycled Water Quality Improvement Plan

The *Recycled Water Product Improvement Plan* was provided as evidence. This was much improved from the last audit and demonstrates that all High priority actions have been completed within the due period.

Recommendation

There are no recommendations in respect of this obligation.

Opportunities for Improvement

The following opportunities for improvement are made in respect of this obligation:


- **OFI-SWC-2019-13:** Restrict access for operators to be able to change the critical limit values in SCADA or establish a process where this can be undertaken through an approval process.
- **OFI-SWC-2019-14:** Incorporate a time-out function for the SCADA simulation mode, used during instrument calibrations. If the simulation mode is inadvertently left on, an operational issue may be missed, which could lead to a non-compliance.
- **OFI-SWC-2019-15:** Consider identifying triggers in the RWMM or RWQMPs for a review of risk assessments between the four year review. This should be at least considered in the case of a change to the scheme or an emergency or incident.
- **OFI-SWC-2019-16:** Ammonia is considered to be a useful indicator for the control of the biological nutrient removal (BNR) process at the Wollongong WRP. At present surrogates, such as chlorine demand, are being used to determine ammonia levels and process performance. Based on the outcomes of ammonia online instrument trials at the Rouse Hill WRP, consider installing an appropriate instrument at the Wollongong WRP to monitor ammonia out of the BNR.
- **OFI-SWC-2019-17:** The *Cryptosporidium* monitoring at the Wollongong WRP should be reviewed due to the number of false positives.


Supplemental Information


Currently there are no triggers in the RWMM or RWQMPs for a review of risk assessments between the four year review. This should be considered in the case of a change to the scheme or an emergency or incident. (refer to **OFI-SWC-2019-15**)

It was noted during the audit that ammonia is an important parameter and there is currently only weekly grab sample monitoring. In particular it is useful to determine the performance of the BNR process. If ammonia is too high it can impact on downstream processes, particularly chlorination. At present the dose rate of chlorine is used as a surrogate, because as the ammonia concentration increases so does the chlorine dose rate required to meet the free chlorine setpoint. It may be beneficial to monitor ammonia directly to help in the management of the BNR. A trial of an ammonia sensor has been carried out by Sydney Water at the Rouse Hill WRP, which seemed to be successful. This technology could be rolled out at Wollongong. (refer to **OFI-SWC-2019-16**)

2.2.5. Asset Management System (4.1.2, 4.1.4 & 4.1.5)

Clause	Requirement	Compliance Grade
4.1.2	<p>Sydney Water must ensure that:</p> <ul style="list-style-type: none"> a) by 30 June 2019, the Asset Management System is certified by an appropriately qualified person to be consistent with the International Standard ISO 55001:2014 Asset Management System – Requirements; and b) once the Asset Management System is certified, the certification is maintained during the remaining term of this Licence. 	 <p>Compliant</p>
<p>Risk</p> <p>Failure to gain and maintain certification of the AMS presents minimal (if any) risk; however, failure to have an effective Asset Management System in place and being implemented presents a high level of operational risk in respect of public health, the environment and the ability of Sydney Water to efficiently and effectively meet its business objectives.</p> <p>Target for Compliance</p> <p>Evidence that Sydney Water's AMS has been certified as being consistent with ISO 55001:2014 by 30 June 2019 and that, once certified, such certification has been maintained.</p>		
<p>Obligation</p> <p>This obligation requires Sydney Water to have its AMS certified as being consistent with ISO 55001:2014 by 30 June 2019. Certification is to be maintained during the remaining term of the Licence.</p>		
<p>Evidence Sighted</p> <p>AMS - OL Audit 6Sept2019_final presentation BSI Group, <i>Assessment Report; Sydney Water Corporation</i> (AS/NZS 4801:2001, ISO 14001:2015, ISO 9001:2015, ISO 55001:2014), Assessment dates 12-22 March 2019 BSI Group, <i>Certificate of Registration</i> (Asset Management System – ISO 55001:2014), Effective date: 12 June 2019 Sydney Water response to the 2019 Audit Questionnaire</p>		
<p>Summary of reasons for Grade</p> <p>Sydney Water demonstrated that its AMS was certified as being compliant with the requirements of ISO 55001:2014 effective from 12 June 2019. As no further assessment of ongoing compliance was undertaken by the independent certifier during the audit period, it is deemed that certification was maintained.</p> <p>Accordingly, Sydney Water is assessed to have demonstrated compliance with this obligation.</p>		
<p>Discussion and Notes</p> <p>Sydney Water advised, and provided a copy of its <i>Certificate of Registration</i> to demonstrate, that its AMS was certified as being compliant with the requirements of ISO 55001:2014 effective from 12 June 2019.</p> <p>Ongoing certification by an independent certifier is typically assessed on the basis of annual surveillance audit and three-yearly recertification audits undertaken by the certifier. As the AMS was certified within the last month of the audit period, no surveillance or recertification audits to assess ongoing compliance were undertaken during the audit period; it can therefore be assessed that certification was maintained.</p>		
<p>Recommendation</p> <p>No recommendations are made in respect of this obligation.</p>		
<p>Opportunities for Improvement</p> <p>No opportunities for improvement have been identified in respect of this obligation.</p>		
<p>Supplemental Information</p> <p>Scope of the Asset Management System:</p> <p>It is noted that Clause 4.1.1 of the Licence requires Sydney Water to develop a Management System that is consistent with ISO 55001:2014; it does not identify the required scope of the management system. Accordingly, the auditor has not assessed the adequacy of the scope of the certified AMS. It is, however, further noted that the <i>Certificate of Registration</i> (which is consistent with the <i>Assessment Report</i>) nominates the following scope:</p> <p style="padding-left: 40px;"><i>“The assets management system associated with all water system assets (physical assets and processes) with Sydney Water's operational area used to provide water, wastewater and stormwater services to customers.”</i></p> <p>This is considered to be consistent with the “Services” provided by Sydney Water as defined in the Licence.</p> <p>Consistency with ISO 55001:2014</p> <p>The auditor has not assessed whether the AMS is consistent with ISO 55001:2014; this assessment has been made by the third-party certifier.</p>		

Clause	Requirement	Compliance Grade
4.1.4	By 30 June 2019, 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 Failure to fully implement the AMS presents a high level of operational risk in respect of public health, the environment and the ability of Sydney Water to meet its business objectives.		
Target for Compliance Evidence that the AMS had been fully implemented and that that all relevant activities were being carried out in accordance with the AMS by 30 June 2019.		
Obligation This obligation requires Sydney Water to fully implement and carry out all relevant activities in accordance with its AMS.		
Evidence Sighted AMS - OL Audit 6Sept2019_final presentation BSI Group, <i>Assessment Report; Sydney Water Corporation</i> (AS/NZS 4801:2001, ISO 14001:2015, ISO 9001:2015, ISO 55001:2014), Assessment dates 12-22 March 2019 BSI Group, <i>Certificate of Registration</i> (Asset Management System – ISO 55001:2014), Effective date: 12 June 2019 Sydney Water response to the 2019 Audit Questionnaire		
Summary of reasons for Grade As part of the process of certifying Sydney Water's AMS as being compliant with the requirements of ISO 55001:2014, the independent auditor/certifier assessed that the AMS was being implemented as part of the certification audit undertaken in respect of Sydney Water's AMS.		
Discussion and Notes In its response to the Audit Questionnaire, Sydney Water advised that: <i>"SWC has demonstrated that the Asset Management System (AMS) was fully implemented across all water system assets (physical asset and processes) within Sydney Water's operational area used to provide water, wastewater, recycled water and stormwater services to customers as part of the certification audit process in June 2019. SWC's AMS was certified by BSI on 12th June 2019."</i> During the audit interviews, Sydney Water referred to the independent auditor/certifier's final certification audit report (<i>Assessment Report</i>), which summarised as follows in respect of the AMS: <i>"This audit found Asset Management System for Sydney Water has a compliant and implemented [Sydney Water's emphasis in audit presentation] asset management system that has been designed to show a clear alignment with the corporate strategy and the asset lifecycle. The Asset Management System is well supported by senior management and all levels of the Sydney Water. It was noted that it is working towards being an embedded continuous improvement system with a clear plan in place that captures and builds on existing processes. Asset information is delivered in a timely manner through the various meeting forums and is aligned with the values of Sydney Water through the objectives in the SAMP. The meetings consider this in determining action. A strength of Asset Management system is the Corporate Strategy Team defining the strategy that addresses the Enterprise Risks, the Asset Management Team and the knowledge management that leads to reliable and accurate data. No issues were found in this audit and it is recommended that the asset management system be certified to ISO 55001:2015."</i> These summary comments are taken to indicate that the independent certifier assessed that the AMS was being fully implemented at the time of the certification audit. It is noted that, although the certification audit was undertaken in March 2019, certification was not awarded until June 2019. Implementation of the Asset Management Framework (which Sydney Water transitioned into the AMS) throughout the audit period is addressed in more detail under clause 4.1.5. Audit of compliance with the requirements of clause 4.1.5 found that the Asset Management Framework/System was fully implemented during the audit period.		
Recommendation There are no recommendations in respect of this obligation.		
Opportunities for Improvement No opportunities for improvement have been identified in respect of this obligation.		
Supplemental Information No supplemental information is provided in respect of this obligation.		

Clause	Requirement	Compliance Grade
4.1.5	<p>Until the Asset Management System has been developed in accordance with clause 4.1.1, certified in accordance with clause 4.1.2(a) and implemented in accordance with clause 4.1.4:</p> <ul style="list-style-type: none"> a) Sydney Water must continue to maintain and implement the asset management framework that was required to be maintained and implemented by Sydney Water under the licence that was the immediate predecessor to this Licence (the Asset Management Framework), b) to avoid doubt, until the Asset Management System has been developed in accordance with clause 4.1.1, Sydney Water may only make changes to the Asset Management Framework that will assist in the transition of the Asset Management Framework to the Asset Management System; and c) Sydney Water must notify IPART, in accordance with the Reporting Manual, of any significant changes that it proposes to make to the Asset Management Framework. 	 Compliant

Risk

Failure to comply with the requirements of this obligation presents a high level of operational risk in respect of public health, the environment and the ability of Sydney Water to meet its business objectives.

Target for Compliance

Evidence that Sydney Water has continued to maintain and implement the Asset Management Framework.

Obligation

This obligation requires Sydney Water to continue to maintain and implement the Asset Management Framework, as defined in the Licence, until its AMS has been developed and certified as being consistent with ISO 55001 and is being implemented. Furthermore, it may only make changes to the Asset Management Framework that will assist in the transition of the Asset Management Framework to the AMS, and must notify IPART if it proposes to make any changes to the Asset Management Framework.

Evidence Sighted

AIS Reservoir Inspection records for WS0348 and WS0048 (as referenced)

AUS_ROV, *Inspection Report; Sydney Water Potts Hill Reservoirs WS0455 & WS0456 Floating Liners*, 16-Dec-18

CIE, *Customer-informed IPART submission (CIPA) Phase 1* (Final Report), 30-Apr-18

ExcelPlas, *Condition Monitoring and Residual Lifetime Report for RPP Cover Samples*, September 2016

Letter dated 8 July 2019 from NSW Health to IPART (re: *IPART's request for comments on Sydney Water Corporation's performance against its Operating Licence during the 2018-19 audit period*)

MS Excel workbook: *11-lqD0000878 - AM Improvement Plan register*

Sydney Water, *Asset Management System (AMS); Asset Management Improvement Plan*, 6-Nov-18

Sydney Water, *Asset Management System and ISO55001:2014 Certification; Project Implementation Plan* (Version 2), 7-Mar-19

Sydney Water, *Asset Master Plan; Wastewater Pumping Stations; Low Pressure Sewerage Systems; Vacuum Sewerage Systems* (AMQ0021) (Version 1), 2019

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Sydney Water, *Decision Framework; Reticulation Water Main Renewal* (Version 6), 6-Mar-19

Sydney Water, *Minutes and actions*, Product & Asset Leadership Group Meeting held on 7-Nov-18

Sydney Water, *Minutes and actions*, Product & Asset Leadership Group Meeting held on 7-Nov-18

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Sydney Water, *Policy; Connecting to Sydney Water systems* (Version 4), 30-Apr-18

Sydney Water, *Policy; Responsibilities of connected customers* (Version 3), 30-Apr-18

Sydney Water, *Procedure; Asset Management Competence and Awareness* (Version 1), 11-Mar-19

Sydney Water, *State of the Assets Report 2019* (Version 2), 2019

Sydney Water, *Strategic Asset Management Framework* (AMQ0234) (Version 2), 18-Sep-15 (superseded)

Sydney Water, *Strategic Asset Management Plan* (Draft Version 3.0), 6-Mar-19

Sydney Water, *Terms of Reference; Asset Management Forum*, 1-Oct-17

Sydney Water, *Terms of reference; Product and Asset Leadership Group*, 1-Oct-17

Sydney Water response to 2019 Audit Questionnaire

WaterNSW and Sydney Water, *Report Catchment to Customer Mid-Term Risk Review* (Final), May 2018

Summary of reasons for Grade

Sydney Water's compliance with this obligation has been assessed by considering a selection of the elements that must be addressed by the Framework, as defined in the Licence. The elements assessed relate to leadership and governance, service levels, asset inventory, asset condition and criticality, decision making process, maintenance management, training, and

review and continual improvement. On the basis of observations made during both the audit interviews and field verification visits and the review of evidence provided in respect of these elements (as discussed below), it is apparent that Sydney Water has continued to implement sound asset management practices consistent with the arrangements detailed in the Asset Management Framework.

It is therefore apparent that Sydney Water has continued to implement its Asset Management Framework whilst it has transitioned, through a process of continual improvement, to an ISO 55001 certified AMS. It has made no changes to the Asset Management Framework during the audit period; accordingly there has been no requirement to notify IPART of any change.

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

Discussion and Notes

Overview:

During the audit period, Sydney Water continued to manage its assets in accordance with its *Strategic Asset Management Framework* (SAMF), which sets the strategic direction for the management of its assets. As described by Sydney Water, the SAMF covers a series of processes, systems, practices and plans reflecting a corporate strategy that aims to ensure its assets are optimally delivering the services demanded by customers and regulators, both now and into the future.

The SAMF also incorporates business, service & asset planning, and life cycle management of asset creation, operations, maintenance, renewals and disposal of assets, along with key enablers of people, information knowledge and risk management as well as performance improvement.

Pursuant to its obligations under the Licence, during the audit period Sydney Water continued to develop its asset management practices such that its AMS is consistent with the requirements of ISO 55001:2014, and was certified as being so in June 2019 (refer discussions and findings in respect of clause 4.1.2 above). Transition to the ISO 55001 certified AMS has been achieved through a process of continual improvement of Sydney Water's asset management practices through strengthening the leadership and formalising the feedback loop through a monitoring and review process.

Pursuant to Appendix 2 of the Licence, Sydney Water's Asset Management Framework must address the following (in summary):

- Robust and transparent methodologies for determining/prioritising requirements and service levels;
- Robust and transparent processes to ensure sustainable delivery of service levels;
- Robust and transparent decision making to balance risk, cost and service;
- An approach that achieves the lowest life cycle costs; and
- Robust and transparent processes of review and continuous improvement in asset management.

As reported by Sydney Water, it has not made any changes to its SAMF, and consequently there was no requirement to notify IPART of any change. Nonetheless, Sydney Water has kept IPART informed of its progress in the development of its AMS to achieve ISO 55001 certification through its annual compliance reporting and annual Operational Audits.

For the purposes of assessing compliance with this obligation, which requires that Sydney Water continues to maintain and implement the Asset Management Framework (that was in place under the previous Operating Licence) until an ISO 55001 compliant AMS has been developed, certified and implemented, consideration has been given to both maintenance of the Framework and the implementation of effective asset management practices. More specifically, consideration has been given to a selection of the elements that must be addressed by the Framework.

Strategic Asset Management Framework:

The *Asset Management Policy*, *Strategic Asset Management Plan* (SAMP) and asset class master plans are central documents of Sydney Water's AMS. Whilst the SAMF (which has now been archived following certification of the AMS and is superseded by the SAMP) outlines Sydney Water's approach to the management of its asset portfolio consistent with the framework requirements identified in the Licence, these documents detail the approach at strategic and tactical levels.

The *Asset Management Policy* outlines Sydney Water's commitment to the sustainable management of its infrastructure assets. It defines Asset Management as a systemic business discipline for managing the life cycle of assets to achieve a desired level of service and financial return within an acceptable risk framework. It specifies the guiding principles by which Sydney Water manages its assets in order to meet its commitments to customers and stakeholders through the use of its assets.

The SAMP articulates Sydney Water's strategic plan in relation to managing its infrastructure. It provides a link between the organisational objectives and strategy, the asset management policy and asset class master plans.

The asset class master plans, for example the *Asset Master Plan; Wastewater Pumping Stations; Low Pressure Sewerage Systems; Vacuum Sewerage Systems*, detail the tactical approach to management of the specific asset class. They provide an overview of the assets, identify performance requirements, detail an assessment of asset class performance and gap analysis, identify future servicing requirements and planning needs, and detail the adopted strategy for the lifecycle management of the asset class together with the associated action and investment plans.

Leadership and Governance:

As reported in respect of the 2018 Operational Audit, Sydney Water has developed a three tiered leadership/governance model that is implemented in respect of the management of the assets. This comprises:

- **The Board (business owner)** which is responsible for stewardship of Sydney Water, and is supported in fulfilling this obligation by the Executive (asset owner) and the Planning and Infrastructure Committee (PIC).
- The Executive has a responsibility to oversee and monitor the direction and performance of the AMS in meeting the asset management obligations and corporate objectives; endorse the asset management policy and asset management obligations; and set AMS accountabilities.
- The PIC monitors and reports to the Board on compliance of the AMS with regulatory requirements.

- The abovementioned *Asset Management Policy* was signed and endorsed by the Managing Director (the Executive), which demonstrates that the Executive has fulfilled this obligation.
- **The Executive Sponsor (AMS owner)** is accountable for the AMS, and responsible for the implementation and review of the asset management policy. The Executive Sponsor is also the conduit between (and a member of) the Product and Asset Leadership Group (PALG) and the Executive.
- As set out in the *Terms of reference; Product and Asset Leadership Group*, the PALG has collective accountability for product and asset capability across the business and sets the direction to meet the corporate strategy. The PALG is supported by the Product Leadership Group (PLG), comprises senior product management practitioners that ensure effective implementation of product management policies and practices across the business, and the Asset Management Forum (AMF).
- Consistent with the *Terms of Reference; Asset Management Forum*, the AMF comprises senior asset management practitioners from across the asset management value chain; it is responsible for identifying, prioritising and recommending actions for asset management improvement capability.
- **Functional Process Councils and Working Groups (service providers)** represent the service providers and are accountable for review and improvements activities associated with delivering asset management plans. These groups liaise with/inform the AMF.

As the PALG and AMF have key support roles in implementing the AMS, a sample of minutes of meetings held by these groups during the audit period were sought as evidence of their activity. The following were provided:

- Minutes and information package for PALG meeting held on 7 November 2018.
- Minutes for AMF meetings held on 17 January 2019 and 21 February 2019.

In each case, decisions and endorsements were clearly documented, information was noted, and progress on actions monitored. For example, the PALG approved the Maintenance Policy at its November 2018 meeting; at its January 2019 meeting, the AMF determined not to endorse the Asset Data & Standards Working Group Terms of Reference as further work was required; and there had been a long and robust discussion in respect of performance reporting at the AMF's February 2019 meeting.

These examples indicate that appropriate governance is being implemented, consistent with the arrangements detailed in the SAMP.

Service Levels:

Pursuant to the Licence requirements, Sydney Water's Asset Management Framework is required to be focussed around current and future levels of service. In its *State of the Assets Report 2019* (which reports on asset management activities over a 2-year period ending, and the state of the asset portfolio as at 1 September 2019), Sydney Water reported that:

"We undertook a program of customer engagement across 2017-2018 to understand how we deliver the essential services that best reflect what customers value. Information from customer engagement has been a key input to decisions on regulated service standards, proposed pricing structures and specific projects. ...

Customer engagement has also informed our 2019-2023 Operating Licence service standards on water interruptions, wastewater overflows on private properties, and a new requirement to fix chronic low-pressure areas in line with customer's willingness to pay. We will continue to engage and collaborate with our customers to inform our future business decisions and regulatory proposals. In the future, our goal is to have a customer advocated pricing submission."

During the audit interviews, Sydney Water advised that it had determined customer expectations through mechanisms including:

- Community forums – more than twenty workshops were conducted, with areas being the Service Performance Standards (i.e. the Water Continuity, Water Pressure and Wastewater Overflow Standards);
- Through developers in new service areas. Sydney Water is dependent (in part) on surveys undertaken by developers covering people in areas within a 10 kilometre radius of a new development; it also works with developers to look at alternative systems, e.g. the provision of dual reticulation systems versus rainwater tanks; and
- Online survey – focussed on customers' expectations and willingness to pay.

As documented evidence, Sydney Water provided a copy of the report *Customer-informed IPART submission (CIPA) Phase I*, which detailed customer engagement undertaken in support of Sydney Water's preparation for its operating licence review and preparation of its 2020-2024 pricing submission.

These activities indicate that Sydney Water has maintained a focus on customers' requirements in respect of levels of service.

Asset Inventory:

Sydney Water maintains its asset inventory principally within its Maximo computerised asset maintenance system (CMMS).

As demonstrated whilst reviewing Maximo during the audit site inspection at Wollongong WRP, Sydney Water records its assets within an asset hierarchy and associated coding based on process. For example:

- ST0014 – Wollongong
- ST0014-70 – Recycled Water Plant
- ST0014-7012 – Microfiltration
- ST0014-7014 – Reverse Osmosis
- ST0014-7030 – Chlorination
- ST0014-7040 – Flow Transfer
- ST0014-7090 – Shared Assets and Structures
- ST0014-7040011 – Recycled Water Pumping (a component of the Flow Transfer process (7040)).

The hierarchy and coding are consistent across Sydney Water's asset portfolio. For example, "12" following the Location and facility type codes will always designate Microfiltration related assets.

Specific assets are recorded against the process, with a location related designation; e.g. ST0014PMP8205 is a Product Water Transfer Pump at Wollongong, which is captured under the 'Recycled Water Pumping' sub-process.

This hierarchical structure provides a logical arrangement for maintaining asset records (including inventory), and provides a robust basis for maintenance management.

Asset Condition and Criticality:

Asset condition and criticality are used to inform decision making in respect of renewal/replacement of assets.

Asset condition is monitored in a number of ways, depending on the nature of the asset and its criticality. They include (for example):

- Observations made during routine maintenance activities; condition rating are recorded when completing a work order and subsequently captured in the Maximo.
- Some maintenance activities are specifically focussed on asset condition. For example, at the Wollongong WRP, monthly vibration monitoring is undertaken on all pumps (47No.) in the ST0014-40 Pump General category.
- Specifically focussed condition assessments are undertaken in respect of individual assets or groups of assets. For example, a *Condition Monitoring and Residual Lifetime Report for RPP Cover Samples* was undertaken in respect of the Potts Hill Reservoir Cover in September 2016 and a further material condition report will be prepared as part of the repairs to be undertaken in 2019/20; an internal inspection was undertaken in December 2018 to quantify the extent of work that would be required as part of repairs to be undertaken in October 2019.

Criticality is reflective of factors including function, redundancy and the impact of failure. Criticality is typically assigned in respect of a specific asset class or sub-category thereof, and once assigned it generally remains unchanged. The assigned criticality informs decisions regarding the extent and frequency of condition monitoring.

During the audit period Sydney Water continued to manage its critical water mains and 'Avoid Fail' (critical) wastewater mains (for example) in accordance with the respective asset class management plans. The *State of the Assets* report outlined the current state of each of these critical asset classes, its proposed short-term and long-term management arrangements, and key initiatives to be implemented. These initiatives include (for example):

- Critical Water Mains:
 - Better understand the impacts of CWM failures on service interruptions to customers and community so Sydney Water can set service levels that provide the value desired by our customers.
 - Continue to apply integrated system planning to optimise capital investment in water mains.
 - Apply failure prediction learning in developing tools that will support our CWM investment program, optimising the life cycle cost of CWM assets.
- 'Avoid Fail' Wastewater Mains:
 - To apply corrosion and odour research and develop a better understanding of causes and prevention of concrete corrosion.
 - To develop and implement corrosion control measures on major trunk systems including improved understanding and use of passive and forced ventilation.
 - To further improve 'avoid fail' wastewater strategy and develop a long-term investment plan (operating and capital) using a range of technology to efficiently extend the service life of pipes.

Decision Making Processes:

Sydney Water has developed decision frameworks for each of its key asset classes. These frameworks guide decision making in respect of asset renewals. Factors including asset risk cost (economic assessment), performance and condition are taken into account. As examples, Sydney Water provided copies of the *Decision Framework; Critical Water Main Renewal* and *Decision Framework; Reticulation Water Main Renewal*.

Maintenance Management:

The implementation of maintenance management practices by Sydney Water was assessed through the site inspections. An overview of the observations made at each of the four sites visited is presented in section 2.1; a brief summary of observations in respect of maintenance management are set out in the following. These demonstrate that asset maintenance is being effectively implemented.

Wollongong Recycled Water Plant:

As reported in section 2.1.2, a detailed review of maintenance management was undertaken by reviewing Sydney Water's Maximo (computerised maintenance management system). The "Click" scheduling tool was also briefly reviewed.

Discussions with the site reliability engineer and his demonstration of Maximo revealed that maintenance at the site is being well managed. By way of example:

- PM (project management activity) No. 10062687 Process and Equipment Monitoring Daily Task was reviewed:
 - Job Plan: ST0014-PEM14-V1 is applicable. This is an operations (as opposed to maintenance) task, which is completed daily.
 - Work Orders are generated in blocks (normally monthly), currently ending 24 September 2019; next due date is 15 September 2019 (i.e. date when the next block of work orders is to be generated).
 - This active job plan involves 8 hours work by one operator.
 - Tasks include SCADA checks, completion of a checklist form, entering values into SCADA, and raising work orders for any follow-on work.
 - Work Order 78172878 was due 5 September 2019; allocated on 6 September 2019; and returned finished on 9 September 2019 with time recorded.
- PM No. 826343 Monthly Vibration Monitoring:
 - This activity is undertaken in equipment in maintenance route ST0014-001.

- Last start date was 1 September 2019; next due date 1 October 2019.
- Monitoring undertaken by external service provider (ALS Laboratories).
- Job Plan: Z-CMR007-V3 is applicable. This sets out the detailed job plan as implemented by the contractor; the job plan is incorporated in the service contract, which is reviewed annually.
- Work Order 77653978 was scheduled on 1 June 2019 and completed on 27 June 2019.
- The summary report for PMP8205 (for example) was emailed to Sydney Water on 18 July 2019. This included a recommendation to “Schedule motor overhaul at next available opportunity”. A full traffic light coded analysis report was attached; it demonstrated that the motor bearing was in need of replacement (pump bearings OK).
- The motor was previously replaced in April 2018. This suggests that there is an issue that needs to be investigated. A logical investigation will be undertaken looking at coupling, pump-motor alignment, etc.
- It is noted that the duty/standby configuration in which this pumpset is installed enables a different approach as compared to a duty only installation.
- It was also noted that in considering repair versus replacement, the unit would be replaced if repair cost is greater than 70% of replacement cost (like for like replacement).

The ‘Click’ system is used principally to schedule maintenance activities and allocate resources. It was noted that it presents some issues for plant based activities due to multitasking approach normally used. Operator/maintainers work on several work orders concurrently, making it difficult to clearly assign times to individual work orders.

Helensburgh Reservoir:

In response to the auditors’ request, Sydney Water provided a sample of 6-monthly reservoir inspection reports, as follows:

- WS0348 – inspections completed on 14 March 2018, 14 November 2018 and 21 May 2019; and
- WS0048 – inspections completed on 16 March 2018, 9 July 2018 and 14 January 2019.

On this basis, inspections at WS0348 have been at intervals greater and WS0048 at intervals less than the nominal 6-monthly planned intervals. This is not considered to reflect a failure to effectively implement the inspection regime.

Maximo records indicate that the last 5-yearly Level 1 inspection of WS0348 was undertaken in November 2015, which means that the next is due in 2019/20; WS0048 was last inspected in April 2015, which means that the next is also due in 2019/20.

Helensburgh Treated Water Pumping Station (at Woronora WFP):

Maintenance of this facility is undertaken by Veolia under BOOT contractual arrangements.

The maintenance regime for the pumpsets, as documented in VAMS, includes PM (Preventative maintenance tasks):

- WYU-WOR-R-0633 – 1 year Motors DLA Inspection;
- WYU-WOR-R-0880 – 6-month or 750 hour Lubrication of Helensburgh Motor bearing;
- WYU-WOR-R-0897 – 6-month Lubrication of pump bearing.

Maintenance history for Pump 1 was requested, but not received at the time of reporting.

Training:

Ongoing training is required to ensure that competence in asset management practices is developed and maintained. This has been an essential component of Sydney Water’s transition, through continual improvement, to an ISO 55001 certified AMS. This requirement is recognised in the *Asset Management System and ISO55001:2014 Certification; Project Implementation Plan*.

The *Procedure; Asset Management Competence and Awareness* describes the framework for managing competence and awareness for asset management related roles. It identifies competency requirements based on role; competencies are categorised as general, asset performance related, asset management related and AMS related.

Sydney Water provided copies of two training presentations, including:

- *Asset Management System Awareness;*
- *Our new Asset Management System; What does it mean for you?*

Whilst specific training records were not reviewed as part of this audit, it is apparent that Sydney Water has arrangements in place for training in respect of its AMS, with the focus in this assessment related to implementation of the new AMS.

Review and Continuous Improvement:

Sydney Water demonstrated that it implements processes for review and continuous improvement of its AMS. As reported above, its transition to the implementation of an ISO 55001 certified AMS has been achieved through a process of continuous improvement. As reported in respect of previous Operational Audits, this process was guided by the findings of rigorous gap analyses which assessed compliance of the previous system with the requirements of ISO 55001.

Sydney Water demonstrated that it undertakes an annual management review of its asset management performance. The report *Asset Management System (AMS); Annual Management Review: 1 July 2017 – 31 October 2018* provides the background reporting presented to a management review meeting in November 2018. Whilst a more extensive portfolio of information was provided for noting by the review committee, items identified for discussion included:

- Overview - Asset management review overview;
- Information on Asset Management performance - Monitoring and measurement results;
- Asset management activity and opportunities for continual improvement:
 - Asset Management Activities; Performance Reporting; and
 - Decisions about continual improvement opportunities; and
- Changes in the profiles of risks and opportunities – Enterprise risk deep dive.

Sydney Water provided copies of its *Asset Management Improvement Plan* and *Asset Management Improvement Plan Register*, which together detailed its improvement plan for 2018/19. Improvement initiatives included (for example):

- Develop, Implement, Monitor & Review Asset, Reliability & Regional Servicing Master Plans 2018.
- Network Assets Renewals (incl. overhauls); Identification and Prioritisation Improvement Initiative.
- Asset Standardisation.
- Finalise the AMS Internal Audit Program/Integrate or align AMS audit program with QMS audit programs.

The *Asset Management Improvement Plan Register* identified a total of thirteen (13) initiatives for development and/or implementation during 2018/19.

NSW Health Comments – Backflow Prevention:

In comments provided to IPART in respect of Sydney Water’s performance during the audit period, NSW Health recommended that the audit consider potential risks related to backflow and connection/cross connection of drinking water services.

Sydney Water advised that its backflow containment policy position is reflected in its:

- *Policy; Connecting to Sydney Water systems* – which outlines requirement for backflow prevention on all connections, and
- *Policy; Responsibilities of connected customers* – which requires that: “Owners of commercial and industrial properties and all other properties with an onsite process must get an accredited backflow plumber to assess the cross-connection hazard rating of the property.”

The requirement for backflow containment is placed on any property that poses a medium or high hazard risk to cross contaminate the drinking water supply in accordance with guidance provided in *AS/NZ 3500 Plumbing and drainage* and additional Sydney Water requirements. Properties that require high and medium level backflow containment are identified through the connection process, trade waste applications, site auditing, ANZIC Codes and plumber identification.

Backflow containment is provided as follows:

- For residential properties with 20mm or 25mm connections, backflow prevention is incorporated into the water meter. These meters are owned by Sydney Water.
- For all other properties, the provision of backflow prevention devices is the responsibility of the property owner (customer). In these cases the customer owns and is responsible for maintenance and testing of the device.

Sydney Water provided a portfolio of documents, including backflow containment process, procedure and operating guidelines (for both staff and plumbers) along with letter templates that it uses to manage backflow prevention within its area of operation. These are managed as controlled documents within the Sydney Water BMIS.

Sydney Water advised that the backflow prevention program is managed by its Customer Property Services team. It has a backflow database (the *Backflow Prevention Containment System*, or BPCS) in which compliance information on properties that have or require backflow containment is recorded (backflow devices are not captured in Sydney Water’s Maximo computerised asset/maintenance management system as they are not Sydney Water assets). The backflow database is updated with property containment information by authorised plumbers using Sydney Water’s online portal. Sydney Water has a list of approximately 1200 licensed plumbers on the website who are accredited to carry out backflow device testing. These plumbers have online access to the Sydney Water backflow database to lodge device test reports.

Property compliance information can also be updated by authorised Sydney Water staff. The backflow database is used to administratively manage letters for installation, annual testing, non-compliance and disconnection. Installation and annual test letters are generated and issued automatically based on process dates and issued to the property owner or authorised agent as they come due.

Reports can be retrieved from the database to produce compliance performance, audits and follow up requirements for affected customers. Properties that require backflow protection are identified through audits, customer advice and data matching are added to the backflow database and the initial notice to install letter is sent. BCRs who manage Major Customer relationships on affected properties conduct backflow audits as part of their portfolio.

Customers have the responsibility to ensure their property meets Sydney Water connection requirements for backflow protection. Sydney Water is focussed on backflow containment at the property boundary; however, it noted that business customers with Recycled Water Supply Agreements are required to carry out cross connection and backflow testing under the terms of their agreements. The compliance mechanism comprises a requirement to provide an annual statutory declaration or annual reporting, and review of the backflow database.

The arrangements in place for approval of connections include notification of backflow prevention requirements, whether it be in a Notice of Requirements issued under Section 73 of the Sydney Water Act or via the ‘Sydney Water Tap In’ portal. Sydney Water advised that it is proposing to undertake a review of all new connection approval requirements. Backflow containment, with a focus on the management of new connections, is to be included in the scope of the review.

Sydney Water advised that in 2019/20 it will commence the implementation of a ‘coverage’ audit program that will identify existing properties that require backflow containment prevention. The methodology will include use of the Sydney Water high hazard risk index and subsequent property and data analysis to identify highest risk customer sites without containment.

Sydney Water further advised that it manages drinking water quality events and incidents in accordance with the *Drinking Water Quality Event Management Plan*. This plan details the action to be taken in response to suspected or confirmed cross-connection.

Further discussion in respect of backflow prevention, and specifically the backlog of cross connection and backflow checks, is discussed in sections 2.2.3 and 3.

Recommendation

There are no recommendations in respect of this obligation.


Opportunities for Improvement

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

Supplemental Information

No supplemental information is provided in respect of this obligation.

2.2.6. System Performance Standards (4.2.2)

Clause	Requirement	Compliance Grade
4.2.2	<p>Water Continuity Standard</p> <p>a) Sydney Water must ensure that, in any financial year:</p> <p>i) no more than 40,000 Properties experience an Unplanned Water Interruption that lasts for more than five continuous hours; and</p> <p>ii) no more than 14,000 Properties experience three or more Unplanned Water Interruptions that each lasts for more than one hour (the Water Continuity Standard).</p> <p>b) 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 and the duration of the Unplanned Water Interruption.</p> <p>c) 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 purpose of clause 4.2.2(a).</p> <p>d) For the purpose of the Water Continuity Standard:</p> <p>i) each separately billed part of a Multiple Occupancy Property is to be counted as a separate Property;</p> <p>ii) for the purpose of clause 4.2.2(a)(i) each separate instance, in a financial year, of a single Property experiencing an Unplanned Water Interruption that lasts for more than five continuous hours is to be counted as a separate Property that has experienced, in that financial year, an Unplanned Water Interruption that lasts for more than five continuous hours; and</p> <p>iii) for the purpose of clause 4.2.2(a)(ii), each Property that experiences, in a financial year, three or more Unplanned Water Interruptions that each lasts for more than one hour is to be counted once only in that financial year.</p>	 <p>Non -Compliant (non-material)</p>
Risk	<p>Failure to comply with the requirements of this obligation presents a high risk to public health as it would indicate that Sydney Water has failed to maintain an adequate level of service.</p>	<p>Target for Compliance</p> <p>Evidence that Sydney Water has achieved its Water Continuity Standard in the audit year.</p>
Obligation	<p>This obligation sets performance standards in respect of Unplanned Water Interruptions that must be met by Sydney Water, and outlines the basis upon which the number of interruptions is to be counted. The Water Continuity Standard is assessed on the basis of two criteria; the number of properties that experience an unplanned water interruption of more than five continuous hours, and the number of properties that experience three or more unplanned water interruptions each of which lasts more than one hour.</p>	
Evidence Sighted	<p><i>BI - Water Continuity Standard - Property Compliance V1.3.5 (data extract)</i></p> <p><i>iConnect – Network Performance Report - June 2019 (Water)</i></p> <p>Letter dated 4 July 2019 from Sydney Water to IPART (<i>Notification - SWC to IPART - non-compliance - Clause 4.2.2 - Water Continuity Standard - 2015-2020 operating licence.pdf</i>)</p> <p>Sydney Water, <i>Field Reporting Guide</i> (Document: D0000121; Version 4), 2-Aug-16</p> <p>Sydney Water, <i>Performance Indicator Sheet; SPS 2 – Water Continuity Standard – OL 4.2.2a (i)</i> (Version 1), 15-Jul-19</p> <p>Sydney Water, <i>Performance Indicator Sheet; SPS 3 – Water Continuity Standard – OL 4.2.2a (ii)</i> (Version 1), 15-July-19</p> <p><i>Sydney Water response to 2019 Audit Questionnaire</i></p> <p>Sydney Water Statement of Compliance 2019 (<i>Statement of Compliance 2018-19_signed.pdf</i> and <i>Schedule A Non Compliances_2018-19 – Final.pdf</i>)</p>	

Summary of reasons for Grade

Sydney Water declared non-compliance with this obligation. The number of properties that experienced an Unplanned Water Interruption that lasted for more than five continuous hours exceeded the Licence limit by more than 25%; the most significant contributing event accounted for 45% of the limit.

Whilst this exceedance reflects a failure to achieve a defined objective, in this case compliance with one part of the Water Continuity Standard, it is not reflective of a systemic failure to assure controlled processes. From an overall perspective, Sydney Water's approach to the management of Unplanned Water Interruptions is consistent with typical water industry practice. On this basis, the non-compliance declared by Sydney Water is considered to be non-material.

It is noted that the number of properties that experienced three or more Unplanned Water Interruption that lasted for more than one hour was well below (approximately 40% of) the Licence limit. Sydney Water is therefore compliant with this part of the obligation.

Discussion and Notes

In a letter dated 4 July 2019, Sydney Water advised IPART that:

"On 10 April 2019, Sydney Water experienced a major break on a critical water main in Punchbowl, which was widely reported in the media that day. The Punchbowl incident impacted almost 16,000 customer properties with an unplanned interruption of more than five hours.

I wish to advise that as a result, we have exceeded the limit of the Water Continuity Standard set in clause 4.2.2(a)(i) of the Operating Licence 2015-2020, which requires that no more than 40,000 properties are impacted in a financial year."

Sydney Water subsequently declared non-compliance with this obligation in its *Statement of Compliance 2019*. As reported in the System Performance Standards Report 2018-19, 55,334 properties experienced an Unplanned Water Interruption that lasted for more than five continuous hours in 2018/19, substantially in excess of the limit of 40,000 properties. The number of properties affected by three or more Unplanned Water Interruptions, each of which lasted for more than one hour, was 5,809 in 2018/19, significantly less than the limit of 14,000 properties.

Sydney Water explained that the abovementioned critical water main break in Punchbowl was the most significant event contributing to the number of properties affected by an interruption of more than five hours duration; approximately 18,000 properties were impacted, accounting for 45% of the Licence limit. The next most significant event affected 4,500 properties.

Summary details of this event are documented in both the *Statement of Compliance 2019* and System Performance Standards Report 2018-19; a more detailed report, Punchbowl 500mm main break event, provides a detailed event sequence.

As reported in the *Statement of Compliance 2019*:

"At around 1am on the morning of 10 April 2019, a break in a 500mm water main occurred in an industrial area at Punchbowl and began emptying the reservoir. An issue was first identified from automated alarms in our SOC based on our SCADA system (IICATS) showing reservoir depletion. The location of the broken water main was difficult to identify as it was hidden behind a factory and water was flowing into a nearby stormwater canal. The field crew needed to walk the 500mm main to identify the actual location of the break. The delay in locating and isolating the broken main resulted in the emptying of the East Hills Reservoir, which supplies water to the area."

The System Performance Standards Report 2018-19 further notes that:

"Once the break was isolated, the impacted area was rezoned to provide water to the customers, however by this point, the period without water had exceeded 5 hours duration."

During the audit interviews, Sydney Water advised as follows:

- An alarm was raised when the water level in the East Hills Reservoir fell to 50%. It then took a further 1½ hours to empty.
- The break was on the main feeding to the reservoir.
- The first "no water" call was received at approximately 3:30am, with the bulk from 6:00am. Approximately 600 calls were received; there were some 2,000 hits on the website.
- As reported above, the break was in an industrial area and discharging into a stormwater channel, thereby making it difficult to locate.
- Once located and isolated, alternative feed arrangements were put in place. This process was carefully managed as it could have resulted in multiple breaks if not handled properly.
- Based on a post event inspection, the break occurred at the only weak spot on the pipeline (CICL pipe).
- An initial debrief was undertaken in August 2019 (note the event was in April 2019); this included review of the detailed event sequence, which documented all actions taken. It was noted that the event had been declared an incident and appropriately escalated (it was treated as a catastrophic failure of the reservoir) and that the response and repair had been undertaken as efficiently as possible.
- The Customer Hub analytics team is looking at how the available SCADA intelligence can be better used to avoid such an incident.

From a broader perspective, Sydney Water notes in the System Performance Standards Report 2018-19 that:

"Over the past twelve months, Sydney Water has continued to maintain a customer centric behaviour on responding to leaks, moving from immediate isolation to remediation in order to minimise the duration of the shutdown and impact on our customers. However, continued drought conditions have resulted in increased soil movement due to moisture level changes, contributing to a number of breaks on large water mains that have been complex to repair and difficult to arrange alternative supplies. This has resulted in a large number of properties being affected by water interruptions for long periods."

Sydney Water's approach to the management of Unplanned Water Interruptions through immediate isolation and rearrangement of feed arrangements to maintain supply (to the extent possible) is consistent with typical industry practice. It

demonstrates that Sydney Water has appropriate processes in place for the management of such incidents. It is also well understood in the water industry that drought conditions typically result in increased numbers of water main breaks.

In considering compliance with this obligation, it is noted that:

- As declared by Sydney Water, it failed to comply with one part of the Water Continuity Standard. Unplanned Water Interruptions that affect properties for a period of more than 5-hours have the potential to impact public health.
- Failure to meet the desired objective, in this case the Water Continuity Performance Standard (level of service) could potentially be assessed as a material non-compliance.
- Conversely, it is not apparent that the failure to fully comply with the Water Continuity Standard was the result of a systemic failure of process. The excessive number of properties affected by an Unplanned Water Interruption of more than five continuous hours was impacted significantly by one event, the particular circumstances of which are considered unusual. From an overall perspective, Sydney Water's approach to managing and minimising the impact of Unplanned Water Interruptions is considered to be consistent with typical industry practice.

On this basis, the non-compliance declared by Sydney Water is considered to be non-material.

It is therefore recommended (refer to **REC-SWC-2019-05**) that Sydney Water completes a formal debrief (including a root cause analysis) with a view to identifying and developing more effective monitoring arrangements that enable timely identification of operational conditions that may affect its performance against the Water Continuity Standard.

Furthermore, noting the time delay between the water main break and the initial debrief, as an opportunity for improvement (refer to **OFI-SWC-2019-18**) it is suggested that Sydney Water undertakes debriefing sessions as soon as practicable following any significant event or incident.

Recommendation

The following recommendation is made in respect of this obligation:

- **REC-SWC-2019-05:** It is recommended that Sydney Water completes a formal debrief (including a root cause analysis) in respect of the Punchbowl water main break with a view to identifying and developing more effective monitoring arrangements that enable timely identification of operational conditions that may affect its performance against the Water Continuity Standard. Such formal debrief should be completed by 31 March 2020.
-

Opportunities for Improvement

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

- **OFI-SWC-2019-18:** It is suggested that Sydney Water undertakes debriefing sessions as soon as practicable following any significant event or incident.
-

Supplemental Information

Notwithstanding the declared non-compliance in respect of this obligation, it is noted that Sydney Water has documented procedures for determining the number of Properties that have experienced Unplanned Water Interruptions, including:


- *Performance Indicator Sheet; SPS 2 – Water Continuity Standard – OL 4.2.2a (i)* – Number of properties that experience an unplanned water interruption exceeding 5 hours.
- *Performance Indicator Sheet; SPS 2 – Water Continuity Standard – OL 4.2.2a (ii)* – Number of properties that experience 3 or more unplanned water interruptions exceeding 1 hour.

In each case, the indicator is defined consistent with the *Operating Licence*, the report to be extracted from MAXIMO and the BI database is defined and the query information (data extract code) is presented. Specific data used includes: Work Order Number; Interruption Type; Duration (determined by analysis of Reported Date/Time; Actual Water Off Date/Time; and Actual Water On Date/Time); Problem Type; Task Code/Remedy Code; Third Party Indicator; and Property Count.


Data used for analysis of Unplanned Water Interruptions is based on information recorded in Work Order reports, as captured in MAXIMO. The requirements for capture of the relevant data are detailed in the *Field Reporting Guide*, which provides guidance for completion of each field of the Work Order form (details may also be captured via the Field Mobility Platform, "Click"). *Review of the Field Reporting Guide* confirms that the captured data is appropriate for the purposes of reporting against the Water Continuity Standard.

The MS Excel workbook *BI - Water Continuity Standard - Property Compliance V1.3.5* captures all water continuity events by Work Order Number. Analysis of the data presented therein confirms that the total number of properties that experienced Unplanned Water Interruptions of more than five hours duration was 55,334, as reported by Sydney Water. As the number of properties experiencing multiple Unplanned Water Interruptions is determined by an alternative data extract, this was not checked.

2.2.7. Providing Information (5.2.4)

Clause	Requirement	Compliance Grade
5.2.4	<p>Sydney Water must advertise in a Sydney-based newspaper at least annually on:</p> <ul style="list-style-type: none"> a) the types of account relief available for Customers experiencing financial hardship; and b) rights of Customers to claim rebates and the conditions that apply to those rights. 	 Compliant
<div> <div> Risk <p>Failure to comply with the requirements of this obligation presents no direct risk to public health or the environment; however, it poses a high level of risk in respect of customer relations and the financial management of Sydney Water's business.</p> </div> <div> Target for Compliance <p>Evidence that Sydney Water had advertised in a Sydney-based newspaper at least annually on the types of account relief available for Customers experiencing financial hardship; and the rights of Customers to claim rebates and the conditions that apply to those rights.</p> </div> </div>		
Obligation <p>This obligation requires Sydney Water to advertise in a Sydney-based newspaper, outlining options in respect of service rebates and financial assistance options, at least once annually.</p>		
Evidence Sighted <p>Sydney Water internal email dated 8 February 2019 (re: <i>Notice of rebates advert</i>) <i>Sydney Water response to 2019 Audit Questionnaire</i> Tear sheet from Daily Telegraph 20 February 2019 edition re: <i>Notice of service rebates and financial assistance options</i> Tear sheet from Illawarra Mercury 23 February 2019 edition re: <i>Notice of service rebates and financial assistance options</i> Tear sheet from Sydney Morning Herald 20 February 2019 edition re: <i>Notice of service rebates and financial assistance options</i></p>		
Summary of reasons for Grade <p>Sydney Water demonstrated, by providing tear sheets from three newspapers, that it had placed an advertisement outlining options in respect of service rebates and financial assistance options in more than one Sydney-based newspaper and a further newspaper covering part of its area of operations during the audit period. Accordingly, Sydney Water is assessed to have demonstrated compliance with this obligation.</p>		
Discussion and Notes <p>Sydney Water provided tear sheets from the Sydney Morning Herald, Daily Telegraph and Illawarra Mercury, which demonstrate that an advertisement outlining options in respect of service rebates and financial assistance options had been placed in each newspaper in February 2019. The advertisements in the Sydney Morning Herald and Daily Telegraph were both published in the 20 February 2019 editions, whilst that placed in the Illawarra Mercury was published on 23 February 2019.</p> <p>Both the Sydney Morning Herald and Daily Telegraph have widespread distribution across Sydney Water's area of operations; the Illawarra Mercury is (as its title implies) distributed primarily in the Illawarra region (which also forms part of Sydney Water's area of operations).</p> <p>Sydney Water also provided a copy of an internal email dated 8 February 2019 providing copies of the advertisement proofs and seeking confirmation that approval had been given for the advertisements to run.</p>		
Recommendation <p>There are no recommendations in respect of this obligation.</p>		
Opportunities for Improvement <p>No opportunities for improvement have been identified in respect of this obligation.</p>		
Supplemental Information <p>No supplemental information is provided in respect of this obligation.</p>		

2.2.8. Assistance Options for Payment Difficulties and Actions for Non-Payment (5.4.3)

Clause	Requirement	Compliance Grade
5.4.3	<p>Sydney Water must provide, free of charge, an explanation of the Assistance Options for Payment Difficulties and Actions for Non-Payment to:</p> <ul style="list-style-type: none"> a) residential Customers, at least annually with their Bills; b) residential Customers who Sydney Water identifies as experiencing financial hardship on the date that Sydney Water first identifies that the Customer is experiencing financial hardship; and c) any other person upon 	 Compliant

Risk

Failure to comply with the requirements of this obligation presents no direct risk to public health or the environment; however, it poses a high level of risk in respect of customer relations and the financial management of Sydney Water's business.

Target for Compliance

Provision of evidence that an explanation of the Procedure for Payment Difficulties and Actions for Non payment has been provided, free of charge, to Customers at least annually with their Bills, to Customers that Sydney Water identifies are experiencing financial hardship, and other persons upon request to the Contact Centre.

Obligation

This obligation requires Sydney Water to take actions aimed at ensuring that Customers experiencing financial hardship are aware of arrangements available in respect of payment difficulties and non-payment of Bills, i.e. the Assistance Options for Payment Difficulties and Actions for Non-Payment.

Evidence Sighted

BillAssist draft outbound call script.pdf

Can you receive a rebate on your bill, undated

Customer Care – what you need to know, undated

Do you need help with other bills and expenses, undated

Email confirmation of regulatory notices_190819.docx (which included email extracts)

Payment Assistance Scheme information for agencies, undated

Payment Assistance Scheme; Assessment checklist for agencies, undated

Sample customer bill (residential property)

Sydney Water, Policy; Overdue payments (Version 2), 22-Feb-18

Sydney Water, Policy; Payment assistance (Version 2), 14-Mar-18

Sydney Water, Procedure; Overdue payments (Version 4), 30-Jun-16

Sydney Water, Procedure; Payment Assistance Scheme (PAS) (Version 3), 5-Feb-18

Sydney Water, Procedure; Producing quarterly customer newsletters (Version 4), 13-May-19

Sydney Water, Water wrap (February to April 2019)

Sydney Water response to 2019 Audit Questionnaire

Summary of reasons for Grade

Sydney Water demonstrated that it is proactive in providing an explanation of the assistance options available for customers having difficulty in paying their bills, with information available via each of the requisite mechanisms. Information is similarly available, however, not so readily apparent, in respect of actions that will be taken for non-payment of bills.

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

Discussion and Notes

In its response to the Audit Questionnaire, Sydney Water advised that:

“The ‘Producing quarterly customer newsletters’ procedure defines the requirements under the Sydney Water Act 1994 and Operating Licence 2015-2020 to provide customers with regulatory information including (but not limited to) annual information providing a brief explanation of the Customer Contract, a summary of the key rights and obligations of customers under the Customer Contract, information on hardship, rebates and contacting Sydney Water. To meet this requirement Sydney Water produces a quarterly Waterwrap which is included with the customer bill. The February to April 2019 edition includes information addressing this requirement.”

The *Producing quarterly customer newsletters* procedure outlines the procedure for producing the quarterly customer newsletters. It indicates that the February–April edition is to include information in relation to the Payment assistance scheme.

Review of a copy of the February to April 2019 edition of Waterwrap reveals that it provides information regarding the payment assistance scheme under the header “*We won’t leave you high and dry*”. More specifically, it invites customers to “... call us if you’re having difficulty paying your water bill ...” and indicates that Sydney Water can talk about:

- *flexible payment terms, such as extending your due date or setting up a regular payment plan*
- *rebates for eligible concession card holders*

- *help with emergency or essential plumbing repairs*
- *personalised support for longer-term payment difficulties, including financial assistance for eligible customers.”*

It also provides a link to Sydney Water’s website for relevant information: www.sydneywater.com.au/helpwithyourbill.

As evidence that the February to April 2019 edition of Waterwrap had been issued with the bills, Sydney Water provided a copy of email correspondence from both of Sydney Water’s bill print suppliers (Computershare and FujiXerox) confirming that Waterwrap had been included in the bills issued to customers during that period. The emails also confirm that the Customer Contract pamphlet (*Our Contract with you*) was issued with the August to October 2018 billing cycle; this pamphlet also includes information indicating that assistance can be provided in the event of payment difficulties.

Sydney Water provided a sample bill, which shows that information regarding the Payment Assistance Scheme is also provided on the reverse side of each Bill. It indicates that:

“If you are having difficulty paying your bill, we can help. We have flexible payment options to help you plan your payments. We may offer payment extensions, a regular payment arrangement, the Payment Assistance Scheme (PAS) and the BillAssist customer assistance program. Call us on 13 20 92.”

Sydney Water identifies customers who may be experiencing financial hardship through a number of mechanisms, including:

- on the basis of a call to the Contact Centre – this relies on identification by the customer service officer based on specific indicators and the nature and tone of the customer’s enquiry. Indicators include (for example) regular requests to defer payment and regular splitting of payment amounts.
- identification by field officers on the basis of direct contact with customers and/or observations in respect of (for example) water use or condition of property.
- identification by the debt recovery team based on payment patterns (including non-payment).

All identification pathways result in “warm transfers” (referrals) to the Customer Care team, which specialises in developing support measures for customers. An assigned case manager (Customer Care team member) will then make contact with the customer to explore and develop assistance options under the BillAssist program. An outbound call script, which is used to guide the discussion, was provided as evidence.

Sydney Water also identifies customers who are experiencing financial hardship through the Payment Assistance Scheme (PAS), the implementation of which is detailed in the *Payment Assistance Scheme (PAS) Procedure*. This scheme, under which customers can be provided funds to credit their accounts, relies (in part) on community welfare agencies to identify customers that may require assistance and undertake an eligibility assessment based on training provided by Sydney Water. A pamphlet, *Payment Assistance Scheme information for agencies*, provides an overview of the key aspects of the scheme, whilst a *Payment Assistance Scheme; Assessment checklist for agencies* form provides a guide/checklist for undertaking an eligibility assessment.

Candidates for assistance under the Payment Assistance Scheme may also be identified by through the Contact Centre. These customers are similarly referred to the Customer Care team, which may in turn seek input from a welfare agency to assess eligibility.

In addition to information provided or action taken in response to an enquiry to the Contact Centre, the *Payment assistance policy*, which explains how Sydney Water can help if a customer is having trouble paying their bill, is available on the Sydney Water website and can be accessed via: www.sydneywater.com.au/helpwithyourbill. This demonstrates that, in addition to availability via the Contact Centre, information regarding payment assistance is readily available to any person via the website.

On the basis of the above discussion and the supplemental information reported below, it is assessed that Sydney Water is proactive in providing an explanation of the assistance options available for customers having difficulty in paying their bills, with information available via each of the requisite mechanisms.

Information in respect of actions for non-payment of bills are similarly addressed:

- Information regarding non-payment is included in the Customer Contract pamphlet (*Our Contract with you*), which as reported above, was distributed to customers with the August to October 2018 billing cycle.
- The *Overdue Payments Policy*, which explains what will happen if a customer does not pay their bill, is available on the Sydney Water website at: http://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mdq3/~edisp/dd_047441.pdf
- The *Overdue Payments Procedure* details the action to be undertaken to recover outstanding charges when a customer does not pay their bill. It is noted that actions include issue of reminder notices upon an account becoming overdue and the issue of debt recovery notices before taking further more positive action such as restriction or disconnection of supply or initiating legal action for debt recovery. The process includes an assessment of the financial capacity of the customer to pay and, where appropriate, referral to the Customer Care team.
- Enquiry to the Contact Centre will result in referral to the Debt Recovery team or Customer Care team, as appropriate.

It is noted that, whilst the *Overdue Payments Policy* is available on the Sydney Water website, it was located by specifically searching from the site masthead; it could not be readily located by navigation from the “Home” page, i.e. via the drop-down menus on the site masthead. As an opportunity for improvement (refer to **OFI-SWC-2019-19**) it is suggested that Sydney Water considers providing more readily identifiable access to the *Overdue Payments Policy* on its website.

Recommendation

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-2019-19:** It is suggested that Sydney Water considers providing more readily identifiable access to the *Overdue Payments Policy* on its website.

Supplemental Information

Sydney Water advised that it has now co-located the Customer Care team with the Debt Recovery team. Furthermore, a member of the Customer Care team has moved into the Debt Recovery team, thereby providing “cross-pollination” of the skill base. These changes have resulted in an improved understanding on the part of the Debt Recovery team of the impact of financial hardship.

Sydney Water explained that it is proactive in its customer care activities, which include (for example):


- Home visits to customers (e.g. some pensioners) who are identified as having “disengaged”. These visits are undertaken by teams of two customer service officers who advise customers of support options that are available and arrange for their implementation where applicable. Sydney Water advised that, to date, it has visited 50 homes out of 300 customers having been identified in the “withdrawn” category. It has received a number of compliments in response to this activity and no complaints.
- Outreach activities – this involves a Sydney Water presence at various community events where customer service officers are available for consultation and to provide advice (including in respect of customers experiencing financial difficulties).
- Thriving communities initiative – this initiative, which was started by Yarra Valley Water, involves other utility organisations and banks working together to support customers together rather than on an individual utility basis. Sydney Water will lead a NSW chapter of this initiative and has a full-time officer working on the initiative. A trail is also underway in conjunction with Service NSW.

Sydney Water provided copies of a number of information brochures which are distributed through its various customer care activities. These include (for example):

- *Customer Care – what you need to know* pamphlet, which includes information in respect of “Flexible payment dates” and “Help with your bill”.
- *Do you need help with other bills and expenses* pamphlet, which promotes support available via the No Interest Loan Scheme, MoneySmart, National Debt Helpline and Service NSW.
- *Can you receive a rebate on your bill* pamphlet, which identifies the criteria required to apply for a concession rebate on a Sydney Water bill.


Based on discussions with Sydney Water representatives during the audit interviews, it is apparent that they are extremely passionate about their work, including fulfilling their customer care obligations under the Licence. It is understood that compliments received by the team are recognised in a manner reflective of the uniqueness and specialty of the performance being recognised. This will no doubt support an ongoing high level of performance in this area of Sydney Water’s activity.

2.2.9. Internal Complaints Handling (5.6.1 & 5.6.2)

Clause	Requirement	Compliance Grade
5.6.1	Sydney Water must maintain a procedure for receiving, responding to and resolving Complaints, which is consistent with the Australian Standard AS/NZS 10002:2014 – Guidelines for complaint handling in organisations (AS/NZS 10002:2014) (the Internal Complaints Handling Procedure).	 Compliant
Risk	Target for Compliance	
Non-compliance with the requirements of this obligation poses a moderate operational risk in that Sydney Water may not otherwise become aware of operational problems, which may affect public health or the environment; it also poses a high risk in respect of Sydney Water's customer and public relations.	Evidence that Sydney Water has maintained a Complaints Handling Procedure consistent with <i>AS/NZS 10002:2014 Customer satisfaction – Guidelines for complaints handling in organisations</i> .	
Obligation	This obligation requires Sydney Water to maintain a procedure for receiving, responding to and resolving Complaints. Such procedure must be consistent with AS/NZS 10002:2014.	
Evidence Sighted	<p><i>CSIA Complaint Handling Self-assessment Workbook - Sydney Water responses</i> CSIA, <i>CHF Assessment Report</i>; Sydney Water; Reg No. 6126, 26 June 2017 Sydney Water, <i>Business Process Design Specification; Manage Customer Services and Interaction</i> (Version 5.0), 5-Sep-18 Sydney Water, Complaint policy (Document No: 735107; Version 1), 1 December 2017, available at: http://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mdq3/~edisp/dd_047440.pdf Sydney Water, <i>Complaint procedure</i> (SWIM Document No: 735113; Version 12), 8-Aug-19 Sydney Water response to 2019 Audit Questionnaire</p>	
Summary of reasons for Grade	<p>Sydney Water demonstrated, by provision of an <i>Assessment Report</i> prepared by the Customer Services Institute of Australia (CSIA), that its Internal Complaints Handling Procedure (complaint handling process) was recertified as being consistent with AS/NZS 10002:2014 in June 2017. Subsequent revisions to the procedure have either enhanced the process or been made to ensure that the procedure remains reflective of Sydney Water's overall business approach.</p> <p>Accordingly, Sydney Water is assessed to have demonstrated compliance with this obligation.</p>	
Discussion and Notes	<p>Sydney Water confirmed that it maintains an internal complaint handling procedure. It further indicated that the procedure aligns with and is responsive to the Australian Standard for complaint handling (<i>AS/NZS 10002:2014 Guidelines for complaint management in organisations</i>). A copy of the <i>Complaint procedure</i> was provided; Sydney Water's <i>Complaint policy</i> is available on the Sydney Water website.</p> <p>Sydney Water's complaint handling process has been certified against the <i>CSIA Complaints Handling Framework (CSIA-CHF 2015)</i>. The <i>CHF Assessment Report</i> prepared by CSIA in respect of a Recertification Assessment undertaken in June 2017 indicates that the <i>Complaints Handling Framework</i> against which Sydney Water's complaint handling was assessed as consistent with AS/NZS 10002:2014.</p> <p>The assessment involved scoring against compliance with the requirements of each relevant clause of AS/NZS 10002:2014; both the individual and overall scores indicate that Sydney Water's complaint handling process is integrated, i.e. its application lies in the "Integration" (as opposed to the "Intention" or "Implementation" phases), which means that: "<i>Evidence exists to show that the attribute is part of the culture, and measurement data is being used to enhance service delivery.</i>"</p> <p>Whilst the CSIA assessment was undertaken in June 2017, review of the document change history reveals that subsequent revisions have involved refinements to ensure that the procedure is reflective of changes in the Sydney Water business approach (e.g. changes to the customer relationship management (CRM) platform; changes to areas names). One revision clarified that the scope of application had been expanded to include complaints received by service providers (contractors, consultants, etc.), which is considered a positive enhancement.</p> <p>On this basis it is assessed that Sydney Water maintains an internal complaint handling procedure (process) that is consistent with AS/NZS 10002:2014.</p>	
Recommendation	There are no recommendations in respect of this obligation.	
Opportunities for Improvement	No opportunities for improvement have been identified in respect of this obligation.	

Supplemental Information

In addition to the CSIA CHF Assessment Report, Sydney Water provided a copy of a self-assessment workbook in which it had compiled evidence of its compliance with the *Complaints Handling Framework (CSIA-CHF 2015)*/AS/NZS 10002:2014. This evidence comprised screenshots from the Sydney Water website and on-line management systems to demonstrate compliance in respect of AS/NZS 10002:2014 elements including enabling complaints, commitment, responsibility and authority, staff awareness, procedures, resources, training, communication, recording of complaint, and managing the complaint.

Clause	Requirement	Compliance Grade
5.6.2	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	 Compliant

Risk

Non-compliance with the requirements of this obligation poses a moderate operational risk in that Sydney Water may not otherwise become aware of operational problems, which may affect public health or the environment; it also poses a high risk in respect of Sydney Water's customer and public relations.

Target for Compliance

Evidence that the Internal Complaints Handling Procedure is fully implemented and that all relevant activities are carried out in accordance with the procedure.

Obligation

This obligation requires Sydney Water to fully implement its Internal Complaints Handling Procedure.

Evidence Sighted

Complaints Reporting 2018-19 (including EWON).xlsx.

CxP Training Complaints.docx (screen shots from online training module).

Document: *Internal Audit Actions.docx* (copy of internal email detailing action to be taken in response to the internal audit of the complaint handling process).

Example Complaints 2018-2019.xlsx.

Sydney Water, *19-10 – Customer Complaints; Customer Delivery; Draft Audit Report*, February 2019.

Sydney Water, Business Process Design Specification; Manage Customer Services and Interaction (Version 5.0), 5 September 2018.

Sydney Water, *Complaint procedure* (SWIM Document No: 735113; Version 12), 8 August 2019.

Sydney Water internal email dated 18 September 2019 (re: Example Complaints 2018-2019) (includes extract from *Completion report based on URM sheet (27 June).xlsx*).

Sydney Water response to 2019 Audit Questionnaire.

Summary of reasons for Grade

Sydney Water demonstrated that it continued to implement its *Complaint procedure* throughout the audit period. Review of a sample of complaint records revealed that they had been effectively managed, whilst performance statistics indicate that some 5,952 complaints were resolved during the audit period.

Sydney Water also demonstrated that relevant staff have undertaken training in respect of the complaint management process. An internal audit of the process identified the need for some improvement; however, this is considered to be reflective of ongoing improvement and not a failure to implement the procedure.

Based on the evidence provided, Sydney Water is assessed to have demonstrated compliance with this obligation.

Discussion and Notes

Complaints are managed in accordance with the *Complaint procedure*. The process workflow is managed through the CRM online portal, which provides a step-by-step guide to the process.

Sydney Water provided a summary of the complaints identified as its responsibility and resolved during the audit period. A total of 5402 directly received complaints and 550 complaints received via EWON (the Energy & Water Ombudsman NSW), i.e. 5952 complaints were resolved.

Analysis of the directly received complaints reveals that the five categories receiving the most complaints were Account (23%), Account – Meter Adjustments (21%), Water Quality – Drinking (12%), Wastewater Overflow (10%) and Odour (8%).

Records for a sample of complaints made during the audit period were provided for review; examples are as follows:

- SR#1-O0VQYV – related to Wastewater Overflow; raised by customer at 12:04 on 30 July 2018; identified as internal sewage spill causing damage to flooring; responded 9:56 on 31 July 2018; customer further advised that sewage pooling around floor waste had already been taken care of, but had previously occurred and was concerned about further occurrence; resolved by advising customer to contact insurer and creating work order (WO 75890437) for CCTV and sewer service inspections; resolved 8:59 on 2 August 2018; closed 9:56 on 23 August 2018.
- SR#1-R4L4J8 – related to drinking water quality; raised by customer at 18:44 on 1 February 2019; identified as black specs coming from cold water taps; responded 13:44 on 5 February 2018; customer experiencing slightly dirty water possibly due to location near the end of main; resolved by flushing the main; customer confirmed problem had disappeared and now happy; resolved 13:44 on 5 February 2019; closed 14:05 on 15 February 2019.
- SR#1-R8SFXP – related to wastewater overflow; raised by customer 19:55 on 10 February 2019; identified as sewage spill on bathroom floor, mopping up with towels; responded 8:02 on 11 February 2019; spoke to customer who advised that spill had been cleaned up with no damage to tiled area; CCTV and inspection work orders (WO 76806472 and WO 76806481) raised and client to be advised of results; resolved 12:15 on 21 February 2019; closed 15:32 on 5 June 2019.
- SR#1-T0V5AO – related to odour; raised by customer at 16:35 on 21 May 2019; identified as very bad odour in the area around the Cronulla WWTP that has been in the area for a couple of weeks; responded 8:09 on 23 May 2019; spoke to

customer who did not believe that the WWTP was the source; advised that Sydney Water was conducting an investigation and providing a response to a Ministerial request; resolved 8:09 on 23 May 2018; closed 10:54 on 4 June 2019.

These records show that the complaints have been effectively managed, with the outcomes completed and reported to the complainant. Details of the timeline over which the complaint has been received, addressed, resolved and closed out are recorded, thereby enabling analysis of response and closure times. In each case, an initial response was made within 2 working days of the complaint being received, consistent with the requirement set out in the Complaint procedure for complaints received by phone.

Effective implementation of the Complaint Handling Procedure requires training of staff involved in management of the process, specifically contact centre staff. Sydney Water provided a copy of a training module *Claims, Complaints and Redress; Topic 2 – Managing Claims, Complaints and Redress* for complaint process management under the new CxP (Customer Experience Platform). Sydney Water also provided an extract from its training records, which indicated that 81 staff members had completed the 4-hour CS.2.070 - *Claims, Complaints and Redress* training module in April and early May 2019.

Sydney Water also provided a copy of a Work Instruction that details the process for creating a service request in response to a customer complaint. This provides screenshots from the CRM portal together with detailed commentary as to how to implement this process.

Sydney Water explained that it had conducted an internal audit of its complaint handling process during 2018 (reported in February 2019). The audit concluded that some improvement is needed, principally in respect of ensuring that all complaints are recorded, post-event analysis, and guidance on how to manage a complaint. In response to the audit findings, three actions have been identified for implementation. These include: reporting on complaints from external bodies such as EWON in internal statistics; Contact Centre staff to overtly recognise complaints as such when describing contact activities, regardless of whether any follow-up activity is required; and investigate altering procedures after CxP Go Live to monitor for, and report on, complaints resolved on first contact. Internal correspondence (for example) demonstrates that Customer Hub staff were to be instructed in respect of complaint recognition, specifically the recording of complaints closed out during the initial contact. The CxP training activity reported above forms part of the response to providing guidance on how to manage a complaint; further assessment will be made following full implementation of CxP.

Sydney Water indicated that, whilst it is likely that audits of the complaints handling process will be included in future internal programs, this has not yet been determined. As an opportunity for improvement (refer to **OFI-SWC-2019-20**), it is suggested that Sydney Water considers implementing a program of regular internal audits of its complaints handling process to ensure that the Internal Complaints Handling Procedure is fully and effectively implemented.

On the basis of the above discussion, it is considered that Sydney Water is fully implementing, and carrying out its complaint management activities in accordance with its Internal Complaint Management Procedure. Although an internal audit has identified “some improvement needed”, this is considered to be reflective of ongoing improvement and not a failure to implement the procedure.

Recommendation

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-2019-20:** It is suggested that Sydney Water considers implementing a program of regular internal audits of its complaints handling process to ensure that the Internal Complaints Handling Procedure is fully and effectively implemented.
-

Supplemental Information

Sydney Water is in the process of changing its CRM and billing software to a new SAP based platform, which it calls the CxP. As part of the transition process, it has developed a *Business Process Design Specification; Manage Customer Services and Interaction* which details the processes that are to be incorporated into the new software.

Review of the specification for *Manage Claims, Complaints and Redress* reveals that it provides a detailed specification of the process and programming requirements, including (for example) details of the process, a process map (flow chart), process step details, business requirements and rules, process interfaces, process roles, reporting requirements and security considerations. Other technical requirements are also specified.

2.2.10. Environmental Indicators (6.2.1)

Clause	Requirement	Compliance Grade
6.2.1	<p>Sydney Water must:</p> <ul style="list-style-type: none"> a) prepare indicators of the direct impact on the environment of Sydney Water's activities (the Environmental Performance Indicators); b) monitor and compile data on the Environmental Performance Indicators; and c) report on the Environmental Performance Indicators in accordance with the Reporting Manual. 	 <p>Compliant (minor shortcomings)</p>

Risk

If the impact on the environment is not monitored the effectiveness of controls cannot be determined.

Target for Compliance

Environmental indicators are monitored and reported in accordance with the Sydney Water Reporting Manual: Operating Licence 2015-2020

Obligation

Sydney Water is required to monitor and report on the environmental indicators, as specified in the Sydney Water Reporting Manual: Operating Licence 2015-2020.

Evidence Sighted

D0000058 - *Sydney Water – Operating Licence Annual Reporting Procedure Environment Compliance and Performance Report 2017-18*

Folios (2018-19):

- Biosolids
- Energy
- Greenhouse Gases
- Waste
- Wastewater Overflows
- Wastewater Treatment
- Flora and Fauna

Letter from Sydney Water to IPART re: Environment Compliance and Performance Report 2017-18

SWEMS0145 – *Annual environment compliance and performance reporting procedure*

Sydney Water response to 2019 Audit Questionnaire

Transmittal email to IPART for 2017-18 ECPR

Summary of reasons for Grade

This clause has been graded as Compliant (minor shortcomings). The reason for this is that energy consumption figures reported, in indicator E1, did not include data from assets operated by BOOT contractors. Although the indicator has been reported in good faith, the figure is not considered to be accurate. Indicator E2 is also inaccurate as it uses the value from E1 in its calculation and in addition renewable electricity generated by BOOT contract assets is also not considered.

Discussion and Notes

It was agreed at the audit that the environmental indicators in question were those specified in the *Sydney Water Reporting Manual: Operating Licence 2015-2020*. Therefore, part a) of the requirement has been met.

Sydney Water has an overarching procedure that outlines the process for annual environment compliance reporting, the *Annual Environment Compliance and Performance Reporting Procedure*. Folios of Progress are used to manage the compilation of each indicators. There are ten environment indicators in the Manual, which are covered by 5 folios as follows:

- Energy
 - E1 Total energy consumption by the water utility (electricity, fuel and gas) in units provided on energy bills.
 - E2 Electricity consumption from renewable sources or generated by Sydney Water expressed as a percentage of total electricity consumption
- Wastewater Overflows
 - E3 Total number of controlled wastewater overflows that occur in dry weather that discharged to the environment, per km of sewer main
 - E4 Total number of uncontrolled wastewater overflows that occur in dry weather that discharged to the environment, per km of sewer main
- Biosolids
 - E5 Estimated total mass of biosolids produced by the water utility
- Waste
 - E6 Percent of solid waste recycled or reused expressed as a percentage of solid waste generated.
 - E7 Total mass of solid waste generated by the water utility.
- Flora and Fauna
 - E8 Total area of clearing of native vegetation.
 - E9 Total area of native vegetation rehabilitated, including due to replanting, weeding and protection by the water utility.

- E 10 Total area of native vegetation gain due to rehabilitation, replanting, weeding and protection by the water utility.

On review of the folios the following points are made:

- E1 is reported in the *Environmental Compliance and Performance Report 2017-18* as only containing electricity consumption by assets under Sydney Water's control. However, this indicator requires Sydney Water to report on all energy consumption due to Sydney Water's activities. There is no distinction in the licence clause to exclude the energy consumption from asset operated by a third-party on behalf of Sydney Water. Data from assets operated under a BOOT contract has been excluded in the calculation of this indicator.
- E2 needs to be recalculated based on the comments under E1, as the E1 value is used in the calculation of E2. In addition, similarly to E1, renewable energy generated by BOOT contractors has not been used in the calculation of E2. (refer to **REC-SWC-2019-06**)
- Other indicators appear to be consistent with requirements.

The 2017-18 environment indicators were reported as required by the *Sydney Water Reporting Manual: Operating Licence 2015-2020*, by email to IPART on 27 September 18.

Recommendation

The following recommendation is made in respect of this obligation:

- **REC-SWC-2019-06:** By 30 June 2020 Sydney Water is to amend its reporting of indicators E1 and E2 to include energy consumption and renewable electricity generation by BOOT contractors.


Opportunities for Improvement

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

Supplemental Information

No supplemental information is provided in respect of this obligation.

2.2.11. Fire & Rescue NSW (9.4.2)

Clause	Requirement	Compliance Grade
9.4.2	Once the memorandum of understanding referred to in clause 9.4.1 is developed and entered into, Sydney Water must use its best endeavours to comply with the memorandum of understanding.	 Compliant

Risk

Failure to comply with this obligation presents a moderate operational risk. FRNSW is a key stakeholder and consumer that relies on Sydney Water's services so that it can fulfil its own obligations as an emergency services authority.

Target for Compliance

Evidence that Sydney Water has used its best endeavours to comply with the Memorandum of Understanding.

Obligation

Sydney Water has entered into a Memorandum of Understanding (MoU) that forms the basis for a cooperative relationship with Fire and Rescue NSW (FRNSW). This obligation requires Sydney Water to use its best endeavours to comply with the arrangements and commitments set out in the MoU.

Evidence Sighted

Letter dated 2 July 2019 from FRNSW to IPART (re: *Sydney Water Corporation 2018 Operational Audit Memorandum of Understanding between Sydney Water Corporation and Fire and Rescue NSW*, dated (signed) 1 December 2015 (available at: http://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mdgy/~edisp/dd_082430.pdf))

Sydney Water, *Minutes and actions*, Sydney Water/FRNSW Strategic Leadership Group Meeting held on 18-May-18.

Sydney Water, *Minutes and actions*, Sydney Water/FRNSW Strategic Leadership Group Meeting held on 24-Aug-19 (draft)

Sydney Water, *Minutes and actions*, Sydney Water/FRNSW Working Group Meeting held on 25-Sep-18

Sydney Water response to 2019 Audit Questionnaire

Summary of reasons for Grade

Sydney Water demonstrated that through its involvement as members of the SLG and the Fire Firefighting Working Group established under the MoU, and the program of work being undertaken in support of the stated objectives (purposes), it has used its best endeavours to comply with the MoU during the audit period. This assessment is supported by comments made by FRNSW.

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

Discussion and Notes

In its response to the Audit Questionnaire, Sydney Water advised that: "*The MOU remains unchanged since its original approval in December 2015 and is available on the Sydney Water website*".

The MoU requires Sydney Water and FRNSW to:

- Establish and participate as members of a SLG, which is intended to meet annually; the purpose of the SLG is detailed in the MoU.
- Establish and participate as members of a Fire Fighting Working Group (FFWG), which is intended to meet quarterly; the role and responsibilities (matters to be considered by) of the FFWG are detailed in the MoU.

Sydney Water provided copies of minutes of SLG meetings held on 18 May 2018 (which was prior to the audit period) and 24 August 2019 (which was subsequent to the audit period; the meeting was postponed by mutual agreement). Review of these minutes reveals that matters considered by the SLG are consistent with its purpose (as stated in the MoU) of:

- discussing broad principles and objectives underlying the MoU.
- monitoring progress in implementing the MoU.
- considering strategic issues and exchange strategic planning information relevant to the objectives of the MoU.
- providing directions to the FFWG as appropriate.
- reviewing recommendations from the FFWG and, where appropriate, endorsing recommendations and providing endorsement to the parties' respective Chief Executives for their consideration.

More specifically, minutes of the meeting held on 18 May 2018 reveal that:

- matters discussed included:
 - update on work program progress.
 - fire sprinklers for Class 1 buildings – trial with Celestino's Science Park development.
 - fire flows for some existing Class 2 development.
- decisions made included (for example):
 - Agreement that a single firefighting design standard applicable to the entire water network is currently not the best way to resolve localised water supply problems. Localised solutions will be identified for each problem area.
 - Sydney Water will complete the mapping of fire flow availability across the entire network to identify all areas with low fire-flow availability and develop and assess policy options.

- The FFWG will prepare a report each year for the SLG of achievements from the year prior and the plan for the following year.

Similarly, minutes of the meeting held on 24 August 2019 reveal that matters discussed included:

- information sharing
- network capacity reporting
- network design criteria.

Sydney Water also provided a copy of minutes of an FFWG meeting held on 25 September 2018. Review of these minutes revealed that matters discussed included:

- rationalisation of the actions table
- review of the SLG minutes
- endorsement of information sharing business requirements
- review of the simplified work program
- local solutions to poor fire flow availability.

In respect of information sharing arrangements, the *Business Requirements Specification; Information Exchange between FRNSW and Sydney Water* indicates that the following actions were being implemented by Sydney Water during the audit period (2018/19):

- Sydney Water regularly providing geospatial information of water and stormwater assets and new lots.
- Sydney Water providing available fire flow information (fire flows and pressures) across the network.

Other actions were being planned during 2018/19 for implementation during 2019/20.

In respect of local solutions to poor fire flow availability, Sydney Water advised that FRNSW and Sydney Water have been working together to resolve localised problems and noted that joint testing in Clarke Street, Vacluse and other streets was completed in early 2019.

On the basis of the evidence provided, it is apparent that Sydney Water used its best endeavours to comply with the MoU during the audit period.

In comments provided to IPART in respect of Sydney Water's performance during the audit period (refer to further discussion in the Supplemental Information section below), FRNSW indicated (in respect of Licence clause 9.4.2, i.e. this obligation) that:

"Sydney Water has made many active endeavours to meet its obligation under this clause."

This supports the above assessment.

Recommendation

There are no recommendations in respect of this obligation.

Opportunities for Improvement

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

Supplemental Information

In comments provided to IPART in respect of Sydney Water's performance during the audit period, FRNSW provided comments in respect of each Licence clause related to the MoU individually (i.e. all elements of clause 9.4). In addition to the comment specifically in relation to clause 9.4.2 (reported above), comments in respect of clause 9.4.3 demonstrated that each of the identified purposes of the MoU are being addressed. More specifically, FRNSW indicated that:

- The MoU has provided a basis for a cooperative relationship.
- The roles and responsibilities of the parties are now considered defined; however, the nature of the relationship has enabled them to expand and contract as required.
- The needs and constraints of each party are considered to be clearly understood.

In respect of the identification and development of strategies for efficient and effective provision of firefighting water (the remaining identified purpose of the MoU), FRNSW commented about (for example) investigations that have been undertaken, resulting in the re-issue of some Statements of Available Pressure and Flow. It is, however, clear from FRNSW's comments that whilst the work undertaken to date has produced positive outcomes, significant work is yet to be done to fully address this requirement under the MoU.


Sydney Water explained that information provided to FRNSW has developed over time, and is being further refined under the MoU arrangements. Historically, it provided maps showing pipes; hydrant locations have now been added. There has been a learning process in relation to (for example) pipe sizes and how relining of aged pipes affects capacity and the impact of network configuration. Based on this new understanding, monitoring and simulation (hydraulic modelling) are now being used to test the network and assess local impacts on a point-by-point basis. This will result in pressure and flow capacity being determined at each node (hydrant). It is noted, however, that modelling to determine capacity at each node takes 1-2 hours; this provides an indication of the volume of work involved.

It is apparent, based on discussions with Sydney Water personnel and comments provided by FRNSW that both Sydney Water and FRNSW recognise that they had developed a better understanding of the other parties needs and constraints as a result of establishing and implementing the MoU. For example, FRNSW commented that:

"... while FRNSW now have a greater understanding of the complexities and costs associated with this obligation and are appreciative of Sydney Water's endeavours to date, a report (or other vehicle) detailing the entire networks performance is yet to be provided to FRNSW."

This outcome alone should be considered beneficial.

2.2.12. End of Term Review (10.1.2)

Clause	Requirement	Compliance Grade
10.1.2	Sydney Water must provide the person undertaking the End of Term Review with such information as is reasonably required to enable the person to undertake the End of Term Review. Sydney Water must provide that person with such information as the person requests within a reasonable time period of receiving that request.	 Compliant

Risk

Failure to comply with this obligation presents no direct risk to public health or the environment; however, it presents a high risk that the outcomes of the End of Term Review may be compromised. This may ultimately result in risk to public health, the environment and Sydney Water's ability to fulfil its business objectives.

Target for Compliance

Evidence that Sydney Water had provided the person undertaking the End of Term Review with information reasonably required for the purposes of undertaking the End of Term Review upon request, and the information had been provided within a reasonable time of receiving the request.

Obligation

This obligation requires Sydney Water to provide information reasonably required for the purposes of undertaking the End of Term Review to the person undertaking the Review, and to provide such information within a reasonable time of receiving the request to do so.

Evidence Sighted

Email correspondence between Sydney Water and IPART with entries dated 28 August 2018, 11 September 2018 and 12 September 2018 (re: *Request for information #3 – CBA*).

Email correspondence between Sydney Water and IPART with entries dated 19 February 2019, 21 February 2019 and 22 February 2019 (re: *Request for information #13 - Water conservation, customer contract, area of operations*).

Email correspondence between Sydney Water and IPART with entries dated 20 February 2019, 21 February 2019 and 22 February 2019 (re: *Request for information 14 - Critical Infrastructure - includes submission from Critical Infrastructure Security Division*).

IPART, 2019 Sydney Water Operating Licence Review:

- *Request for Information #1* (Cost Benefit Analysis - Various), 15-Aug-18
- *Request for Information #2* (Cost Benefit Analysis - ADWG), 20-Aug-18
- *Request for Information #3* (Cost Benefit Analysis - System Performance Standards), 31-Aug-18
- *Request for Information #4* (Customer Contract), 13-Sep-18
- *Request for Information #5* (Cost Benefit Analysis - Various), 21-Sep-18
- *Request for Information #6* (Cost Benefit Analysis - Data request by DPE), 24-Sep-18
- *Request for Information #7* (Cost Benefit Analysis - Various), September 2018
- *Request for Information #8* (Cost Benefit Analysis - Providing services to WIC Act licensees), October 2018
- *Request for Information #9* (Cost Benefit Analysis - Various), October 2018
- *Request for Information #10* (Cost Benefit Analysis - Customer Contract), 17-Oct-18
- *Request for Information #12* (Cost Benefit Analysis - Water Pressure Standard), 1-Nov-18
- *Request for Information #17* (Cost Benefit Analysis - Customer Contract), March 2019

Sydney Water, IPART Requests for Information:

- *Response 1*, 3-Sep-18
- *Response 2*, 4-Sep-18
- *Response 3*, 7-Sep-18
- *Response 4 (SPS 1)*, 26-Sep-18
- *Response 5 (Customer Contract 1)*, 2-Oct-18
- *Response 6*, 4-Oct-18
- *Response 7*, 10-Oct-18
- *Response 8 (Customer Contract 2)*, 12-Oct-18
- *Response 9*, 12-Oct-18
- *Response 10*, 17-Oct-18
- *Response 11*, 19-Oct-18
- *Response 12*, 23-Oct-18
- *Response 13*, 24-Oct-18
- *Response 14*, 26-Oct-18
- *Response 15*, 26-Oct-18
- *Response 16*, 9-Nov-18
- *Response 21*, 11-Mar-19

Sydney Water response to 2019 Audit Questionnaire

Summary of reasons for Grade

Sydney Water demonstrated that it had provided the person undertaking the End of Term Review (IPART) with such information as was reasonably required (it provided a response to all requests) and in most cases had complied with the

requested timeline. Where the requested timeline could not be achieved, Sydney Water had notified and agreed alternative timing with IPART.

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

Discussion and Notes

In its response to the Audit Questionnaire, Sydney Water advised that:

“IPART issued 12 Request for Information (RFI) documents during the Cost-Benefit Analysis phase of their review, and a further 5 RFI documents after they had issued the draft Operating Licence Package for stakeholder comment. In total, IPART asked 165 questions, although many questions consisted of several parts or sub-components.

Information was provided as it became available, typically before or within the timeline requested. Sydney Water ultimately provided a response to each question, spread over 21 separate documents.

Where the collection of information was delayed, we notified IPART that the requested timeline would not be achieved. Delays were typically due to a request for information that Sydney Water does not routinely report, which required the development of bespoke queries to extract the required information from relevant systems. Resources for this task were limited, particularly as the 2017-18 Operational Audit was being undertaken simultaneously and the relevant staff were also involved in that process.”

Sydney Water provided copies of the majority of the information requests and response documents, review of which demonstrated that it had provided information in response to IPART’s (the person undertaking the End of Term Review) requests. For example:

- *Request for Information #1* (15 August 2018) sought response to Questions 1-11 (some multi-part) by 5 September 2018; response to Questions 1-6 was provided in *Response 1* on 3 September 2018 and response to Questions 7-11 was provided in *Response 2* on 4 September 2018.
- *Request for Information #2* (20 August 2018) sought response to Questions 12-17 by 7 September 2018; response to Questions 12-16 was provided in *Response 1* on 3 September 2018 and response to Questions 17 was provided in *Response 2* on 7 September 2018.
- *Request for Information #3* (31 August 2018) sought response to Questions 18-46 by 12 September 2018 or alternative date as indicated in a letter 24 August 2018; response to Questions 18-30 was provided in *Response 4* (SPS1) on 26 September 2018, response to Questions 33, 37 & 38 was provided in *Response 6* (SPS2) on 4 October 2018, response to Questions 35 & 39 was provided in *Response 9* on 12 October 2018, response to Questions 43-46 was provided in *Response 10* on 17 October 2018, response to Questions 41 & 42 was provided in *Response 11* on 19 October 2018 and response to Questions 31, 32, 34, 36 & 40 was provided in *Response 15* on 26 October 2018.
- *Request for Information #12* (1 November 2018) sought response to Questions 139-144 by 8 November 2018; response to these questions was provided in *Response 16* on 9 November 2018.
- *Request for Information #17* sought response to Questions 163-165 by 11 March 2019; response to these questions was provided in *Response 21* on 11 March 2019.

Sydney Water demonstrated that, when it anticipated that information could not be provided within the requested timeline, it had notified IPART accordingly. For example:

- Email correspondence between Sydney Water and IPART (re: *Request for information #3 - CBA*) demonstrates that Sydney Water notified IPART of its inability to meet the requested timeline and that IPART had acknowledged the need for extensions of time for some responses regarding system performance standards (which was the subject of *Request for Information #3*). As reported above, the final response to *Request for information #3* was provided on 26 October 2018.
- Email correspondence between Sydney Water and IPART (re: *Request for information #13 - Water conservation, customer contract, area of operations*) demonstrates that Sydney Water notified IPART that it required additional time to complete its response to *Request for information #13* (submission by Thursday, 28 February 2019 instead of Monday, 25 February 2018) and that IPART had accepted the proposed change of submission date.
- Email correspondence between Sydney Water and IPART (re: *Request for information #14 - Critical Infrastructure - includes submission from Critical Infrastructure Security Division*) demonstrates that Sydney Water notified IPART that it required additional time to complete its response to *Request for information #14* (submission by Monday 4 March 2019 instead of 28 February 2018) and that IPART had accepted the proposed change of submission date.

On the basis of the sample of requests for information and response reviewed, it is apparent that Sydney Water had provided the person undertaking the End of Term Review (i.e. IPART) with such information as was reasonably required (it provided a response to all requests) and in most cases had complied with the requested timeline. Where the requested timeline could not be achieved, Sydney Water had notified IPART, in most cases suggesting an alternative submission date. IPART had acknowledged and agreed to such changes.

Recommendation

No recommendations are made in respect of this obligation.

Opportunities for Improvement

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

Supplemental Information

No supplemental information is provided in respect of this obligation.

3. Previous Recommendations

Number	IPART's Recommendation to the Minister	Evidence	Discussion	Status
2016-17-5	By 30 June 2018: b) in consultation with NSW Health, review the preventive measures for end user sites (on-site preventive measures) as documented in the recycled water management system and supporting material, including the content of the Annual Declaration and compliance inspection checklist, to ensure they are appropriate to the level of risk.	<ul style="list-style-type: none"> Operational audit 2016-2017 water quality recommendations – proposed approach for discussion Recycled Water Customer Meeting form – tertiary scheme Recycled Water Customer Meeting form – secondary scheme Example of letter of variation including the revised statutory declaration. Email chain between NSW Health and Sydney Water regarding proposed new template documents Email chain between NSW Health and Sydney Water regarding preventative measures for different scheme types. JOG Meeting Minutes 20 May 2019 Wollongong Golf Club Recycled Water Supply Agreement 2012 Wollongong Golf Club Recycled Water Supply Agreement Variation 2019 Submission – NSW Health – Dr Kerry Chant – 2019 Sydney Water Operational Audit 	<p>Continuing (parts (a) and (c) were closed out in the 2018 audit).</p> <p>The evidence supplied supports that Sydney Water consulted extensively with NSW Health on this issue. It can be seen that it was initially raised through the Operational Audit 2016-2017 Water Quality Recommendations – Proposed Approach for Discussion paper. More recently it was raised at the May 2019 JOG and subsequently discussed via email.</p> <p>Following the discussions with Health, changes have been made to the customer meeting forms and the recycled water agreements. All but one of the agreements has been signed by the customer. However, that discussion does not impact upon the successful completion of this recommendation.</p> <p>NSW Health in their submission to this audit confirmed that consultation had taken place and the user agreements were being updated.</p> <p>It is considered that requirements of this recommendation have been met and it is now complete.</p>	Completed
2016-17-6	By 30 June 2019: a) ensure Sydney Water staff and contractors who are responsible for verifying the onsite preventive measures are trained and assessed as competent to implement their responsibilities b) establish and implement a process for on-going competency assessment, and c) review all end user sites to confirm end users are meeting their obligations under their end user agreement or the Recycled Water Quality Management Plan and implement the interruption to supply process where appropriate.	<ul style="list-style-type: none"> Operational audit 2016-2017 water quality recommendations – proposed approach for discussion Diploma in Water Operations from TAFE NSW awarded to a Business Customer Representative managing recycled water business customers. IWES "Recycled Water Management" course certificate awarded to a Business Customer Representative managing recycled water business customers. Compass eLearning completed recycled water training report for a Business Customer Representative managing recycled water business customers within the Wollongong scheme. Customer meeting form Wollongong Golf Club. 	<p>a)</p> <p>Sydney Water has reviewed the role and associated skills of BCRs in relation to recycled water customer management and shared this approach with NSW Health in the document titled "Operational audit 2016-2017 water quality recommendations – proposed approach for discussion".</p> <p>It was agreed with NSW Health that the role of BCRs does not extend to independently verifying onsite preventative measures. Business customers are required to implement the required preventative measures under the terms of their Recycled Water Supply Agreement. The agreed process to confirm the implementation of preventative measures is</p>	Completed

Number	IPART's Recommendation to the Minister	Evidence	Discussion	Status
		<ul style="list-style-type: none"> • <i>Statutory declaration from Wollongong Golf Club</i> • Position Description – Business Customer Representative • List of Industrial and Irrigation Customer Statutory Declarations 2019 	<p>through customer annual statutory declarations. The extent of the verification role that Sydney Water staff undertake in this regard is to review customer statutory declarations to check for any issues.</p> <p>The BCR Position Descriptions require the incumbent to obtain a Certificate IV or Diploma in Water Industry Operations. It is considered that this is adequate training to undertake the role and achieving the qualification is considered to be an appropriate assessment of adequacy. This part is considered to be complete.</p> <p>b)</p> <p>To ensure the BCRs competency they are to complete the Compass eLearning RWQMP module on an annual basis for each scheme where the BCR manages recycled water customers (or an equivalent scheme, for schemes where the eLearning module has not been developed). They will also complete the RWQEP Compass eLearning module on an annual basis.</p> <p>The Compass system is used to schedule training to ensure that it remains current.</p> <p>It is considered that this part of the recommendation has been successfully completed.</p> <p>c)</p> <p>The process currently employed, 6 monthly meetings and annual statutory declarations, has been developed in liaison with NSW Health. The agreements and checklists used during meetings have both been improved. It is therefore considered that this process is adequate to determine that customers are meeting the obligations of their end-user agreements.</p> <p>Evidence has been provided that this process is being implemented. It is considered that this requirement has been met.</p>	

Number	IPART's Recommendation to the Minister	Evidence	Discussion	Status
2018-01	By 30 June 2019, ensure reservoir roofs, in particular the Parklea drinking water reservoir, have been inspected safely as per the reservoirs inspection schedule, including with the required safety equipment and associated training.	<ul style="list-style-type: none"> • RS0449 AISReservoir Inspection 150119 (Parklea Reservoir) • RS0447 AISReservoir Inspection -2019-07-30 • Inspection history – RS0447, PR0449, WS0337 • COMPASS report_2018 Work Safely at Heights training 	<p>Inspectors attended the relevant training course on 11/12/2018 for Work Safely at Heights - (RIIWH5204D). The training record from Compass was provided. Compass generates a reminder when training is about to expire.</p> <p>Both reservoirs' roofs at Parklea have been inspected as per the reservoir inspection schedule (6 monthly) and are included in the maintenance schedule, including all other elevated reservoirs. The inspection sheet for the Parklea drinking water reservoir was provided. In addition, the inspection sheet for Kellyville Reservoir was also provided. The inspection schedule and history from these reservoirs were sighted.</p> <p>It is considered that sufficient evidence has been provided to assess that this recommendation has been completed.</p>	Completed
2018-02	By 30 June 2019, have processes in place to document target finish dates, priorities, revised dates and reasons for delay in implementing improvement actions on drinking water.	<ul style="list-style-type: none"> • 1009538 – 2018-19 Drinking Water Product Improvement Plan • Agenda JOG 18 Feb_2019_final • Minutes JOG meeting 18 Feb_final 	<p>The <i>Drinking Water Product Improvement Plan</i> has been revised with a process in place to track target finish dates, priorities, revised dates and reasons for delay. An interactive dashboard has been developed that provides a summary of the actions in the Improvement Plan. This was presented to NSW Health in the February 19 JOG meeting. The progress of the improvement actions is now discussed as a standing item with NSW Health in JOG meetings.</p> <p>It is considered that sufficient evidence has been provided to assess that this recommendation has been completed.</p>	Completed

Number	IPART's Recommendation to the Minister	Evidence	Discussion	Status
2018-03	By 31 March 2019, test all main to meter pipes to prevent cross-connections prior to the supply of recycled water from Sydney Water's main to any properties within Sydney Water's dual reticulation schemes and establish a hold point prior to supply of recycled water.	<ul style="list-style-type: none"> D0001401 <i>Process flow for recycled water main to meter flow test in dual reticulation</i> RW0007 - <i>Commissioning Recycled Water Scheme</i> WOQ5162 - <i>Managing Water Quality Customer Complaints</i> WNS0034 Investigation & Management of cross-connections WR5184 - Recycled water main to meter connection inspection SWConnect Extract for disinfection related to dual reticulation supplies WR5184 -WO76221572 Alyssa Ave Kellyville CivilMaintoMeterFlowTestWWIMSR-12000459 Weekly Report Extract - <i>Recycled main to meter flow test report May 19</i> 	<p>A process flow chart has been created to assign responsibilities for parts of aspects of the recycled water main to meter flow test process in dual reticulation systems.</p> <p>Main to meter flow tests are conducted during the disinfection process of new recycled water mains. SWConnect (developer web portal) has been modified to ensure that main to meter services are available for testing at the time of disinfection. An extract from SWConnect provided as an example of a flow test at time of disinfection is WR5184 – WO76221572 Alyssa Ave Kellyville.</p> <p>After the Final inspection from NSW Fair Trading and the flow test is completed, a recycled water meter may be released for installation. This is a hold point in the process flow.</p> <p>A weekly report is run to confirm that flow tests have been completed on properties that have a recycled water meter installed and to identify any properties that have not recorded a main to meter flow test as complete. An extract from the report was provided.</p> <p>It is considered that this recommendation has been successfully completed.</p>	Completed
2018-04	By 30 June 2019, have processes in place to document target finish dates, priorities, revised dates and reasons for delay in implementing improvement actions on recycled water product and recycled water schemes.	<ul style="list-style-type: none"> Minutes JOG meeting (1001047)18 Feb 2019 Recycled Water Product Improvement Register (1009540) 	<p>2018-19 <i>Recycled Water Improvement Plan</i> has been revised with a process in place to track target finish dates, priorities, revised dates and reasons for delay. An interactive dashboard was also developed that provides a summary of the actions in the improvement plan. This was presented to NSW Health in Feb JOG meeting and the progress of the improvement actions is now discussed as a standing item with NSW Health in JOG meetings.</p> <p>The new <i>Recycled Water Product Improvement Plan</i> is considered to be significantly better than the process that was in place and meets all the requirements of the recommendation. It is considered that this recommendation is complete.</p>	Completed

Number	IPART's Recommendation to the Minister	Evidence	Discussion	Status
2018-05	By 30 June 2019, update the pamphlet prepared under clause 5.2.1 to include or refer to information regarding the ability for a customer to enter into agreements with Sydney Water (separate to the Customer Contract) for the provision by Sydney Water of services to the customer.	<ul style="list-style-type: none"> “Our contract with you” pamphlet. 	<p>The “<i>Our Contract with you</i>” has been updated to refer to contracts other than the <i>Customer Contract</i> that may be in place. The previous shortcomings related to a failure to fully address the requirement that the pamphlet:</p> <p><i>“contains information regarding the ability for a Customer to enter into agreements with Sydney Water (separate to the Customer Contract) for the provision by Sydney Water of Services to the Customer”.</i></p> <p>The pamphlet has been updated and now includes information regarding the ability for a customer to enter into alternative agreements with Sydney Water for the provision of services (by Sydney Water) to the customer separate to the customer contract. The changes appear on page 3 of the pamphlet under the heading of <i>What will Sydney Water do?</i> They are found as the 7th and 8th dot points under that heading, as follows:</p> <p><i>“What will Sydney Water do?</i> <i>We’ll:</i></p> <ul style="list-style-type: none"> <i>consider requests for an agreement for the provision of services, separate to the Customer Contract</i> <i>meet the terms of any other agreements you have with us that are separate from the services covered by the Customer Contract.”</i> <p>It is therefore apparent that this recommendation has been addressed.</p>	Completed

Number	IPART's Recommendation to the Minister	Evidence	Discussion	Status
2018-06	By 30 June 2019, review data extraction processes for reporting against the Wastewater Overflow Standard to ensure an improvement in the reporting of the actual number of events.	<ul style="list-style-type: none"> SPS 4 & 5 – Sewage Overflow Standard OL 4.2.3 2017-18. SPS 4 & 5 – Sewage Overflow Standard OL 4.2.3 2017-18 Revised. SPS 4 & 5 – Sewage Overflow Standard OL 4.2.3 2018-19. Property_Compliance_Sewage 2017-18. Property_Compliance_Sewage 2017-18 Revised. Property_Compliance_Sewage 2018-19. 	<p>Sydney Water has reviewed the data extraction processes and updated the procedure document to ensure the data is extracted and reported accurately for the Wastewater Overflow Standards. Comparison of Version 1 and Version 2 of the Performance Indicator Sheet for SPS 4 & 5 reveals a significant update with additional explanation and process detail included.</p> <p>More specifically, Sydney Water has clearly identified the maintenance codes used to identify dry weather sewage overflows and included additional steps to ensure that multiple occupancy properties are being counted as single properties, consistent with the Licence definition of the Wastewater Overflow Standard. These additional steps include a validation process using spatial and billing system data to identify multiple occupancy properties that have been affected.</p> <p>On this basis, it is considered that this recommendation has been addressed.</p>	Completed

4. Glossary

Notation	Description
ADWG	Australian Drinking Water Guidelines
AGWR	Australian Guidelines for Water Recycling
AMS	Asset Management System
AS	Australian Standard
BCR	Business Customer Representative
BI	Business Intelligence
BMIS	Business Management Information System
BOD	Biological Oxygen Demand
BOOT	Build Own Operate Transfer
C.t	Concentration (mg/L) x Time (minutes)
C2C	Catchment to Customer
CCP	Critical Control Point
CDP	Contribution Development Plan
CHF	Complaints Handling Framework
CMS	Customer Management System
CRM	Customer Relationship Management
CSIA	Customer Services Institute of Australia
CxP	Customer Experience Platform
DWMM	Drinking Water Management Manual
DWQEMP	Drinking Water Quality Emergency Management Plan
DWQMS	Drinking Water Quality Management System
EKAMS	Effluent Knowledge and Management System
EPA	Environmental Protection Agency
EPIRMP	Emergency & Pollution Incident Response Management Plan

FFWG	Fire Fighting Working Group
FRNSW	Fire and Rescue NSW
HIDRA	Hazard Identification and Risk Assessment
IICATS	Integrated Instrumentation, Control, Automation and Telemetry System
IMS	Integrated Management Systems
IPART	Independent Pricing and Regulatory Tribunal
ISO	International Organisation for Standardisation
JOG	Joint Operational Group
KPI	Key Performance Indicator
LIMS	Laboratory Information Management System
LRV	Log Reduction Value
MoU	Memorandum of Understanding
NATA	National Association of Testing Authorities
NOM	Natural Organic Matter
NSW	New South Wales
NZS	New Zealand Standard
OCP	Operational Control Points
ODMS	Online Data Management System
OFI	Opportunity for Improvement
PDMS	SCADA Database
PFD	Process Flow Diagram
R&D	Research and Development
RWMM	Recycled Water Management Manual
RWQEMP	Recycled Water Quality Event Management Plan
RWQMP	Recycled Water Quality Management Plan
RWQMS	Recycled Water Quality Management System

SCADA	Supervisory Control and Data Acquisition
SLG	Strategic Liaison Group
SOC	System Operations Centre
SOP	Standard Operating Procedure
SR	Service Request
SWIM	Sydney Water Information Management
SWIRL	Sydney Water Incident Recordings and Learnings
TAG	Technology Approval Group
UKWIR	United Kingdom Water Industry Research
UPG	Unit Process Guidelines
VAMS	Veolia Asset Management System
WAMC	Water Administration Ministerial Corporation
WFP	Water Filtration Plant
WI	Work Instruction
WQ	Water Quality
WRP	Water Recycling Plant
WSAA	Water Services Association of Australia
WFP	Water Filtration Plant
WIOA	Water Industry Operators Association of Australia



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A decorative graphic at the bottom of the page consisting of a solid dark blue wave-like shape with two thin, light blue curved lines above it.

E Sydney Water's statement of compliance

Statement of Compliance 2019

For 2018 /19

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

Sydney Water reports as follows:

1. This statement documents compliance during 2018-19 with all obligations to which Sydney Water is subject by virtue of its Operating Licence.
2. This report has been prepared by Sydney Water 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 is subject under the *Sydney Water Act 1994*.
3. Schedule A provides information on all obligations with which Sydney Water did not comply during 2018-19.
4. Other than the information provided in Schedule A, Sydney Water has complied with all conditions to which it is subject.
5. The compliance reports have been approved by the Chief Executive Officer and the Chairman of the Board of Directors of Sydney Water.

DATE:

27/8/19

Signed:



Name:


Kevin Jones

Designation: Chief Executive Officer (interim)

DATE:

30/8/19

Signed:



Name:

Bruce Morgan

Designation: Chairman

Schedule A - Non Compliances 2018-19

Obligations breached, including a brief description of each obligation

Assets

4.2 System Performance Standards

4.2.2 Water Continuity Standard

a) *Sydney Water must ensure that, in any financial year:*

i) *no more than 40,000 Properties experience an Unplanned Water Interruption that lasts for more than five continuous hours*

i. Date or period of non-compliance (including whether and how many customers have been affected)

In 2018-19, there were 55,334 properties affected by an unplanned water interruption (shutdown events) of more than five continuous hours duration.

Sydney Water became aware it would very likely breach the water continuity limit subsequent to a large water main break in Punchbowl in April 2019.

ii. Nature and extent of non-compliance

Exceedance of the threshold limit for the number of properties impacted by an unplanned water interruption of greater than five hours duration. Sydney Water exceeded the limit by more than 15,000 properties.

iii. Results of any monitoring (where applicable)

Not applicable.

iv. Reasons for non-compliance

Up until March 2019, the number of properties affected by unplanned water interruptions exceeding five continuous hours was tracking within the limit of 40,000 properties. However, one significant watermain break incident at Punchbowl (East Hills reservoir) in April 2019 impacted around 18,000 properties. This incident alone accounted for 45% of the licence limit.

Incident detail:

At around 1am on the morning of 10 April 2019, a break in a 500mm water main occurred in an industrial area at Punchbowl and began emptying the reservoir. An issue was first identified from automated alarms in our System Operations Centre (SOC) based on our SCADA system (IICATS) showing reservoir depletion. The location of the broken water main was difficult to identify as it was hidden behind a factory and water was flowing into a nearby stormwater canal. The field crew needed to walk the 500mm main to identify the actual location of the break. The delay in locating and isolating the broken main resulted in the emptying of the East Hills Reservoir, which supplies water to the area.

v. Remedial action taken

Once the break was identified and isolated, the impacted area was rezoned to provide water to the customers.

Sydney Water is continuing to develop advanced analysis tools to better monitor fluctuations in pressure or increases in pressure above the normal operating window to reduce the impact and likelihood of these recurrent water main breaks in the future.

vi. Actual/anticipated date of full compliance

Not applicable – the Water Continuity Standard is a threshold limit for a financial year, which was not met in 2018-19.

Sydney Water will aim to meet the performance standard in 2019-20.

