IPART

Independent Pricing and Regulatory Tribunal
New South Wales

Sydney Water Corporation Operational Audit 2016-17

Report to the Minister

Compliance Report
Water

December 2017

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The Independent Pricing and Regulatory Tribunal (IPART)

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Tribunal Members

The Tribunal members for this review are:

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Mr Ed Willett

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1	21 December 2017	Provided to the Minister
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3	8 February 2018	Updated to correct error related to the 2015-16 grade in clause 2.2.2 in Table 2.2 on page 13.

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Summary

The Independent Pricing and Regulatory Tribunal of New South Wales (IPART) has completed the second operational audit (the audit) of Sydney Water Corporation's (Sydney Water) compliance with the requirements of its 2015-2020 Operating Licence (the licence). This audit covers the period from 1 July 2016 to 30 June 2017 (2016-17). We have engaged a specialist auditing firm, Atom Consulting (Atom), to undertake the audit. We have prepared this report to summarise the audit findings for the Minister for Energy and Utilities, the Hon. Don Harwin, MLC (the Minister).

The 2016-17 audit findings demonstrate that Sydney Water has shown an overall high level of compliance with its licence. Sydney Water was assigned Full Compliance for the majority of licence clauses audited this year, but Sydney Water's audit grades for its water quality clauses were not as good relative to last year. Although the quality of water produced by Sydney Water continues to be of a high standard and meet public health requirements, our auditor identified minor shortcomings that require attention from Sydney Water to ensure a high standard of water quality is maintained.

Sydney Water has demonstrated that it has made progress towards implementing recommendations from previous audits. In areas where less than full compliance has been assigned, we have made recommendations for Sydney Water to continue to improve and maintain compliance with its licence.

Our recommendations

There were seven clauses for which our auditor did not assign Full Compliance. Our ten recommendations to Sydney Water are listed below. Our auditor prepared a final audit report detailing its findings and recommendations (Appendix C). We endorse all of the findings, except in relation to the audit grade assigned for clause 2.1.2 of the licence related to drinking water quality, which we have assigned a High Compliance grade instead of the auditor's Adequate Compliance grade. Overall we assign four clauses a High Compliance grade, two clauses an Adequate Compliance grade and one clause a Non-Compliant grade.

Recommendations to Sydney Water

Licence and Licence Authorisation

1 By 30 June 2018: 12

- ensure that substance charges for commercial customers are charged to three decimal places in accordance with the IPART Determination No. 5, 2016 Maximum prices for Sydney Water Corporation's water, sewerage, stormwater drainage and other services, and 12
- develop and implement an auditable quality assurance process to confirm the accuracy of data entry of set fees. 12

Water Quality (Drinking Water)

2 Invite NSW Health to all risk assessments (eg, catchment to tap or system risk assessments) undertaken in relation to Sydney Water's systems (whether or not the system is operated by Sydney Water) that will consider public health risks. 14

3 By 30 June 2018: 15

- in consultation with NSW Health, update and implement the risk assessment process to ensure adequacy of inputs to, and outputs from, the risk assessment and ensure inputs include a generalised process flow diagram and the attendance of relevant stakeholders 15
- in consultation with NSW Health, develop or update all system process flow diagrams against the requirements of Element 2, Component 1, Action 2 (A generalised flow diagram should be constructed describing the water supply system from catchment to consumer) of the Australian Drinking Water Guidelines, and 15
- use the process flow diagram currently being developed for the Nepean water filtration plant, to review the risk assessment for that plant. 15

Water Quality (Recycled Water)

4 By 31 March 2018, complete a desktop review of the most recent compliance inspections for all end user sites to identify any outstanding high risk non-compliances and initiate appropriate action to address non-compliances, including interruption of supply where appropriate. 17

5 By 30 June 2018: 17

- in consultation with NSW Health, develop an interruption to supply process where end users are not meeting their obligations under their end user agreement or the Recycled Water Quality Management Plan 17
- 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, and 17
- review the role and associated competencies for Sydney Water staff and contractors who are responsible for verifying the on-site preventive measures. 17

6 By 30 June 2019: 17

- ensure Sydney Water staff and contractors who are responsible for verifying the on-site preventive measures are trained and assessed as competent to implement their responsibilities 17
- establish and implement a process for on-going competency assessment, and 17
- 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. 17

7 By 30 June 2018, ensure all Sydney Water fluoridation systems are designed, installed, and operated in accordance with the *NSW Code of practice for fluoridation of public water supplies 2011* (unless an exemption has been received from NSW Health), with particular reference to: 19

- ensuring the dosing capacity of the fluoride dosing equipment does not exceed 110% of the target dose rate 19
- ensuring water traps remain filled 19
- providing appropriate colour coding and marking of dosing pipes 19
- replacing dust mask filters every 13 weeks 19
- maintaining a minimum of three months storage of fluoridating agent or apply for an exemption from this minimum standard 8.2.1.1 from NSW Health 19
- ensuring emergency response plans are consistent with Appendix C of the *NSW Code of practice for fluoridation of public water supplies 2011* 19
- submitting written notifications to cover all periods of repair/maintenance, and 19
- ensure internal audits assess compliance with all relevant requirements of Chapter 5 of the *NSW Code of practice for fluoridation of public water supplies 2011*. 19

Performance Monitoring

8 By 31 March 2018: 29

- review its reporting process for infrastructure indicator I5 to provide assurance for future reported data, and 29
- evaluate the data it has historically reported for indicator I5 and report corrected data if necessary. 29

9 By 30 June 2018: 29

- assess whether its current processes for capturing site evidence for sewage overflow events and its compliance with its processes is sufficient for its business processes, and 29
- demonstrate that it has in place an appropriate audit trail for events where the priority has been changed. 29

10 By 31 December 2018, put in place appropriate measures to ensure that overflow ceased times are recorded accurately in future. 29

Sydney Water is required to provide us with a report on its progress in implementing these recommendations by 31 March 2018, in accordance with the Reporting Manual.

Overview of audit findings

The 2016-17 audit found that Sydney Water had an overall high level of compliance with its licence. This is the second audit in the 5-year term of the licence.

We assigned to Sydney Water Full Compliance with 20 of the 27 clauses audited, a High Compliance for four clauses, an Adequate Compliance for two clauses, and a Non-Compliant for one clause. We agreed with all the audit grades assigned by the auditor, except one – we have assigned High Compliance to clause 2.1.2 related to drinking water quality, instead of Adequate Compliance. The compliance grades that we applied to the audit are explained in Appendix A. In summary, we assigned:

- **Full Compliance** with all auditable requirements relating to:
  - Water quality relating to drinking water (clause 2.1.5)
  - Water quantity (clauses 3.1.1, 3.2.2, 3.2.3 and 3.2.5)
  - Assets (clauses 4.1.1, 4.1.5, 4.2.1, 4.2.2, 4.2.3 and 4.3.1)
  - Customers and consumers (clauses 5.1.2, 5.2.4, 5.4.3 and 5.8)
  - Quality management (clause 7.1.1), and
  - Memoranda of understanding (clauses 9.1.1, 9.1.3, 9.2.1 and 9.3.1).
- **High Compliance** with requirements relating to:
  - Water quality relating to drinking water (clause 2.1.1 and clause 2.1.2) and recycled water (clause 2.2.1), and
  - Performance monitoring relating to performance indicators and system performance standards (clause 8.4.1).
- **Adequate Compliance** with requirements relating to:
  - Water quality relating to recycled water (clause 2.2.2) and fluoridation (clause 2.3.1).
- **Non-Compliant** with requirements relating to:
  - Licence and Licence authorisation relating to pricing (clause 1.9.1). This non-compliance was self-reported by Sydney Water and confirmed by this audit.

Sydney Water's compliance is summarised in Table 1 below:

Table 1 Sydney Water's compliance in 2016-17 with its 2015-2020 Operating Licence

Licence part	Number of audited clauses	Compliance grade assigned				
		Full	High	Adeq	NC	NR
Part 1 – Licence and licence authorisation	1	-	-	-	1[a]	-
Part 2 – Water quality	6	1	3	2	-	-
Part 3 – Water quantity	4	4	-	-	-	-
Part 4 – Assets	6	6	-	-	-	-
Part 5 – Customers and consumers	4	4	-	-	-	-
Part 7 – Quality management	1	1	-	-	-	-
Part 8 – Performance monitoring	1	-	1	-	-	-
Part 9 – Memorandum of understanding	4	4	-	-	-	-
Total	**27**	**20**	**4**	**2**	**1**	**0**

a Sydney Water self-identified one non-compliance in clause 1.9.1 of Part 1 of the operating licence. This clause was also audited.

Note: Full = Full Compliance; High = High Compliance; Adeq = Adequate Compliance; NC = Non-Compliant; NR = No Requirement.

Annual statement of compliance

In preparing this report we have also reviewed Sydney Water's annual Statement of Compliance (Appendix D). This is an exception based report approved by the Managing Director and the Chairman of the Board of Directors of Sydney Water. It lists any licence non-compliances that occurred during the year. Further, any remedial action taken, or in the process of being taken, is reported. This year Sydney Water reported one non-compliance with its licence in relation to the pricing clause.

Progress with previous recommendations

Finally, we note that in 2016-17 Sydney Water completed two out of three outstanding recommendations from previous operating audits. These recommendations related to pricing and providing information to customers and consumers. One recommendation is ongoing. This relates to recycled water quality monitoring. The auditor reported that this recommendation is on track to meet the 30 March 2018 completion date specified in last year's audit report. We will continue to monitor and report on progress against this ongoing recommendation during next year's audit.

1 Introduction and scope

Sydney Water Corporation (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 Operating Licence (licence) issued to Sydney Water under Part 5, section 12 of the Act.

We have completed the 2016-17 annual operational audit of Sydney Water's compliance with obligations imposed on it by its operating licence. We do this by receiving and reviewing reports, undertaking and attending audit interviews with utility staff, and undertaking field verification to investigate how effectively the requirements of the licence are met in practice. At the completion of the audit we publish the audit report and report our findings in this Report to the Minister for Energy and Utilities, the Hon. Don Harwin, MLC (the Minister).

We applied a risk-based approach to the Sydney Water audit. Further, we assessed compliance by reviewing an annual statement of compliance prepared and approved by Sydney Water (Appendix D). This is an exception based report listing any licence non-compliances that occurred during the year. This statement also includes what remedial action has been taken, or is being taken, to resolve any reported non-compliances.

1.1 Purpose and structure of this report

The purpose of this report is to inform the Minister of Sydney Water's performance against its audited operating licence obligations for the audit period and to set out recommendations in response to these findings.

- This chapter (Chapter 1) explains the scope of the audit review and the process followed in undertaking the audit.
- Chapter 2 presents the audit findings and recommendations.
- Chapter 3 summarises the progress by Sydney Water to address and implement recommendations from previous audits.
- Appendix A contains the table of compliance grades used for this audit.
- Appendix B contains the audit scope.
- Appendix C provides the auditor's detailed audit report.
- Appendix D provides Sydney Water's annual statement of compliance.

1.2 Audit scope

This audit covers the period from 1 July 2016 to 30 June 2017.

The audit scope for this year included obligations relating to:

- Licence and licence authorisation (Part 1) – requirement relating to pricing.
- Water quality (Part 2) – requirements relating to drinking water, recycled water and Fluoridation Code.
- Water quantity (Part 3) – requirements relating to roles and responsibilities protocol and economic level of water conservation.
- Assets (Part 4) – requirement relating to the implementation of the asset management systems, systems performance standards and response time for water main breaks.
- Customer and consumers (Part 5) – requirements relating to the customer contract, providing information, assistance options for payment difficulties and actions for non-payments and code of conduct.
- Quality management (Part 7) – assessment of Sydney Water's progress in developing a quality management system consistent with AS/NZS ISO 9001: 2008.
- Performance monitoring (Part 8) – requirements relating to performance indicators and system performance standards.
- Memorandum of understating (Part 9) – requirements relating to maintaining memoranda of understanding with NSW Health, Environment Protection Authority and Water Administration Ministerial Corporation.

No clauses from Part 6 (Environment), Part 10 (End of term review), Part 11 (Notices) and Part 12 (Definitions and interpretations) were audited this year, following the risk-based approach used in the auditing program.

We consulted with NSW Health, Department of Planning and Environment (DPE), NSW Environment Protection Authority (EPA), Department of Primary Industries (DPI) Water (now the Department of Industry – Water) and Fire and Rescue NSW and sought public submissions in determining the scope of the audit. The audit scope is provided in Appendix B. This year, NSW Health identified some incidents with the Supervisory Control and Data Acquisition (SCADA) systems and automated controls at the Nepean and North Richmond Water Filtration Plants.[1] As a result the auditor included a site visit to the Nepean Water Filtration Plant. All submissions from stakeholder agencies were generally satisfied that Sydney Water had met its obligations under the licence relevant to their portfolio.[2]

We sought submissions from the public on matters related to the licence prior to the audit interviews. We advertised for public submissions in the Sydney Morning Herald and Daily Telegraph on 3 May 2017. We received no public submissions.

1 Letter to IPART, Dr Ben Scalley, Director, Environmental Health, NSW Health, 25 August 2017.

2 Letter to IPART, Mr Frank Garofalow, Group Director of Regulation, DPI Water, 23 August 2017; Letter to IPART, Ms Jacinta Hanemann, Regional Manager Operations, Metropolitan Infrastructure, NSW EPA, 24 August 2017; Letter to IPART, Ms Prue Gusmerini, Director Water and Utilities, Metropolitan Water Directorate, DPE, 18 August 2017; and Letter to IPART, Chief Superintendent Greg Wild, Assistant Director, Fire Safety, Fire & Rescue NSW, 30 August 2017.

1.3 The audit process

We monitor compliance with the licence through reporting requirements and a risk-based audit approach. Under this approach, we assess the risk of non-compliance with a licence obligation to determine an appropriate audit frequency for that requirement. We audit clauses that we consider to be 'high risk' more frequently, while low risk clauses are audited less frequently. We audit all requirements of the licence at least once during the 5-year term of the licence.

Adopting a risk-based approach has improved the effectiveness and efficiency of the auditing process, without increasing risks to the community. The approach allows audit resources to be targeted to areas of higher risk. It also reduces the overall burden of compliance for the utility.

We engaged Atom Consulting (Atom) to undertake the 2016-17 audit of Sydney Water. The auditor was required 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 information and evidence requirements, 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 face-to-face 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 Sydney Water achieved against each of the identified obligations of the licence (as per our risk-based audit scope), provide supporting evidence for this assessment and reporting on the level of compliance according to our compliance grades (Appendix A).
7. Assess and report on progress by Sydney Water in addressing any comments made by the relevant Minister and/or recommendations endorsed by us following previous audits, providing supporting evidence for these assessments.
8. Verify the calculation of performance indicators associated with requirements of the relevant licence and undertake an assessment of any underlying 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.

Our auditor adopted an audit methodology that was consistent with *AS/NZS ISO 19011:2014 Guidelines for Auditing Management Systems*. This guideline sets out a systematic approach to defining 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 *ASAE 3100 (2017) Compliance Engagements* (issued by the Auditing and Assurance Standards Board), *AS/NZS ISO 9001:2016 Quality management systems* –

Requirements, New South Wales Code of Practice for Fluoridation of Public Water Supplies (2011) and *ISO 55001:2014 Asset Management System – Requirements*.

Our auditor also carried out the audit according to our *Audit Guideline for Public Water Utilities May 2016*.[3] Under this guideline, the auditor can make recommendations or suggest opportunities for improvement. Where we support an auditor's recommendation, we follow up the matter to ensure that it is addressed.

Where the auditor suggested opportunities for improvement, we take a different approach. Sydney Water can decide to implement an opportunity for improvement, based on its own assessment of whether the improvement is a prudent and efficient way to achieve its outcomes. We take this approach to balance improved performance with the investment required to achieve it. That is, we want the utility to consider the pricing implications of continued improvement and value for money, before the utility implements further improvements. As a consequence, we do not follow up the auditor's suggested opportunities for improvement.

We held a project start up meeting with the auditor on 28 July 2017, 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 18 September 2017. At this meeting, expectations and protocols for the conduct of the audit were agreed. All parties adhered to the agreed protocols throughout the audit.

Our auditor conducted audit interviews on 18 and 20 September 2017 at Sydney Water's office in Parramatta. On 19 September 2017, the auditor also undertook a site visit to the following locations:

- Nepean Water Filtration Plant
- Prospect Water Filtration Plant
- Campbelltown reservoir complex
- Liverpool Water Recycling Plant, and
- water main renewal at Guildford.

Our auditor assessed the Sydney Water's compliance with the relevant requirements of the licence according to the compliance grades outlined in Appendix A.

3 Available on our website at www.ipart.nsw.gov.au.

2 Audit findings and recommendations

This chapter provides a summary of the audit findings and recommendations for each of the audited clauses of the licence. The 2016-17 audit is the second audit of the 2015-2020 operating licence.

Each section includes a table providing a comparison of Sydney Water's audit performance during its licence period. We abbreviate the compliance grades according to the following convention:

- **Full** = Full Compliance
- **High** = High Compliance
- **Adeq** = Adequate Compliance
- **NC** = Non-Compliant
- **NR** = No Requirement.

Following each table, we discuss compliance and reasoning for the grade. We also discuss, if identified, any recommendations and opportunities for improvement.

2.1 Licence and licence authorisation

Our auditor assigned Sydney Water a Non-Compliant grade for clause 1.9.1. We agree with this audit grade.

Part 1 of the licence, Licence and Licence authorisation outlines what Sydney Water is authorised to do under the licence, its obligations regarding its stormwater drainage systems, the term of the licence and its obligations regarding the connection of services and pricing matters.

Under the risk-based auditing framework, we consider that this part of the licence poses a moderate risk with respect to likelihood and consequence of non-compliance.

Table 2.1 Compliance with Part 1 of the licence – Licence and licence authorisation

Clause	Requirement	Compliance grading				
1	**Licence and licence authorisation**	**2015-16[a]**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
1.9.1	Pricing	NC	NC			

a IPART, *Sydney Water Corporation Operational Audit 2015-16 – Report to the Minister – Compliance Report*, December 2016.

Note: NC = Non-Compliant.

Non-Compliant (clause 1.9.1) with setting fees and charges

Our auditor assigned Sydney Water Non-Compliant for clause 1.9.1 which requires Sydney Water to 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 fixing maximum prices determined from time to time by IPART under the IPART Act. We agree with this audit grade.

Our auditor noted that Sydney Water self-reported four non-compliances associated with this clause, including:[4]

- an undercharging of the substance charges for commercial trade waste customers due to customers being charged to two decimal places instead of three
- customers who requested asset construction details were overcharged by 60 cents per plan
- collecting developer charges without a registered Development Servicing Plan (DSP) in place and without Treasury approval to charge a price less than the maximum price under the relevant methodology for the Hoxton Park recycled water scheme, and
- collecting developer charges without a registered DSP in place and without seeking Treasury approval to charge a price less than the maximum price under the relevant methodology for the Oran Park/Turner Road recycled water scheme.

IPART's 2016 pricing determination[5] (released June 2016) sets the unit price for substance charges for Commercial Customers to three decimal places and introduced a rounding rule for these charges.[6] The charges have been set to three decimal places since 2012. The undercharging was a result of Sydney Water truncating the charges for the commercial customers to two decimal places and not implementing the new rounding rule.

The overcharging of customers requesting asset construction details resulted from Sydney Water incorrectly entering the price for providing building over asset details ($45.29) being mistakenly entered into its Plans Notification of Costs Invoicing system (during the annual Consumer Price Index update of the Plan) as the price for providing asset construction details ($45.69). Prior to 1 July 2016, the price for both services was the same. Sydney Water adjusted its invoicing system once it became aware of the error. The non-compliances in relation to the DSP follow on from the non-compliance previously reported for clause 1.9.1 in the 2015-16 audit, when the auditor recommended that Sydney Water should complete, register and apply a DSP for the Oran Park/Turner Road recycled water scheme by 30 June 2017. The DSPs for the Hoxton Park and Oran Park/Turner Rd recycled water schemes were registered by IPART on 18 August 2016 and 28 June 2017 respectively. This recommendation is now closed off.

We make one recommendation to Sydney Water in relation to clause 1.9.1, based on the auditor's recommendations.

4 Sydney Water declared a non-compliance in relation to clause 1.9.1 prior to the audit in its Statement of Compliance, 24 August 2017.
5 IPART, Sydney Water Corporation maximum prices for water, sewerage, stormwater drainage and other services from 1 July 2016, June 2016,
6 Ibid, Table 18.

Recommendation to Sydney Water

1 By 30 June 2018:

- ensure that substance charges for commercial customers are charged to three decimal places in accordance with the *IPART, Sydney Water Corporation maximum, prices for water, sewerage, stormwater drainage and other services from 1 July 2016*, June 2016, and
- develop and implement an auditable quality assurance process to confirm the accuracy of data entry of set fees.

Our auditor identified no opportunities for improvement for clause 1.9.1. However, we identify the following opportunity for improvement for this clause:

OFI 1.9-1: We note this is the second time in two years that Sydney Water has detected that a Development Servicing Plan was not in place for a new recycled water scheme. Sydney Water should review its procedures and processes to ensure that all current and future recycled water schemes have registered Development Servicing Plans, and any approvals necessary from NSW Treasury, in place prior to charging and collecting charges.

2.2 Water quality

Our auditor assigned Sydney Water Full Compliance for clause 2.1.5, High Compliance for clauses 2.1.1 and 2.2.1 and Adequate Compliance for clauses 2.1.2, 2.2.2 and 2.3.1. We agree with these audit grades, except in relation to clause 2.1.2, where we have assigned High Compliance.

Sydney Water's audit grades for its water quality clauses were not as good relative to last year. Although the quality of water produced by Sydney Water continues to be of high standard and meet public health requirements, our auditor identified minor shortcomings that require attention from Sydney Water to ensure a high standard of water quality is maintained. Our auditor noted that the minor shortcomings identified in relation to water quality did not impact Sydney Water's ability to achieve defined objectives or to assure controlled processes, products or outcomes including the protection of public health, was not compromised.

Part 2 of the licence, Water Quality, requires Sydney Water to have and implement water quality management systems that are consistent with the *Australian Drinking Water Guidelines* (ADWG) and *Australian Guidelines for Water Recycling* (AGWR), to the satisfaction of NSW Health. It also requires Sydney Water to complete a review of its public reporting on water quality in consultation with its Customer Council and NSW Health by 31 December 2016, and comply with the *NSW Code of practice for fluoridation of public water supplies 2011* (Fluoridation Code).

Under the risk-based auditing framework, we consider that this part of the licence poses a low to very high risk with respect to likelihood and consequence of non-compliance.

Table 2.2 Compliance with Part 2 of the licence – Water Quality

Clause	Requirement	Compliance grading				
2	**Water quality**	**2015-16[a]**	**2016-17**	**2017-18**	**2018-19**	**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			
2.1.5	Drinking water quality- review of public reporting on water quality	-	Full			
2.2.1	Recycled water quality management system consistent with AGWR	Full	High			
2.2.2	Recycled water quality management system - implementation	High	Adeq			
2.3.1	Compliance with Fluoridation Code	-	Adeq			

a IPART, *Sydney Water Corporation Operational Audit 2015-16 – Report to the Minister – Compliance Report*, December 2016.

High Compliance (clause 2.1.1) with maintaining a drinking water quality management system

Our auditor assigned Sydney Water High Compliance for clause 2.1.1, which requires Sydney Water to maintain a drinking water quality management system that is consistent with the ADWG, except to the extent that NSW Health specifies otherwise. We agree with this audit grade.

Our auditor assigned an audit grade for each of the 12 elements of the ADWG, as well as assigning an overall grade for the licence clause. Our auditor assigned Full Compliance to all elements except Element 2 (Assessment of the water supply system), which was assigned High Compliance. Our auditor identified several areas of excellence in relation to Sydney Water's compliance with the ADWG framework, including Element 4 (Operational procedures and process control), Element 5 (Verification of drinking water quality) and Element 8 (Community involvement and awareness).

Our auditor identified a few minor shortcomings in relation to Element 2 of the ADWG framework requirements. In particular, the auditor found that for the Nepean Risk Review, the auditor could not establish the generalised flow diagram for the purpose of Element 2 nor evidence of the requirement for, nor undertaking of, field verification of this diagram. The auditor found the process of iterative risk review and review on system change was not articulated in the documentation provided by Sydney Water. However, the auditor did not consider that these shortcomings compromise Sydney Water's ability to achieve defined objectives or assure controlled processes, products or outcomes including the protection of public health.

High Compliance (clause 2.1.2) with implementing a drinking water quality management system

Our auditor assigned Sydney Water Adequate Compliance for clause 2.1.2, which requires Sydney Water to fully implement and carry out all relevant activities in accordance with the drinking water quality management system, and to the satisfaction of NSW Health. We disagree with this audit grade and have assigned High Compliance for this clause.

Our auditor assigned an audit grade for each of the 12 elements of the ADWG, as well as assigning an overall grade for the licence clause. Our auditor assigned Full Compliance to all elements except Element 2 (Assessment of the water supply system), which was assigned Adequate Compliance. Our auditor identified a number of minor shortcomings in relation to Element 2 of the ADWG framework requirements. In particular, the auditor found that:

- Whilst there was an overarching catchment to tap schematic, there was no catchment to tap diagram for the water supply systems reviewed. The ADWG requires a generalised process flow diagram describing the water supply system from catchment to tap.
- There was no evidence of the generalised flow diagram used for the Nepean Risk Review undertaken in the audit period.
- There was a lack of evidence that a team with appropriate knowledge and expertise was involved in the risk assessments for the specific water treatment plants reviewed.
- The link between the catchment to tap risk assessment and the plant risk assessment could not be established.

However, the auditor did not consider that these shortcomings compromise Sydney Water's ability to achieve defined objectives or assure controlled processes, products or outcomes including the protection of public health.

In weighing up Sydney Water's overall compliance with the 12 elements of the ADWG – namely 11 elements with Full Compliance and only one element (Element 2) with Adequate Compliance - we considered it appropriate to assign an overall audit grade of High Compliance for this clause. We note that some of the shortcomings identified in this year's audit were identified as opportunities for improvement in previous audits, for example, improvements to process flow diagrams. In May 2016, Sydney Water commissioned an auditor to undertake an independent review or 'gap analysis' of its compliance with the ADWG. NSW Health was advised of the review and receives ongoing updates. This review identified process flow diagrams as an area for improvement. In June 2017, Sydney Water commenced stage 2 of this project to develop improved system based drinking water management plans, including a review of its system process flow diagrams, and has a program in place to revise these diagrams to address any shortcomings.

We make two recommendations to Sydney Water in relation to clauses 2.1.1 and 2.1.2, based on the auditor's recommendations and discussions with NSW Health.

Recommendations to Sydney Water

2 Invite NSW Health to all risk assessments (eg, catchment to tap or system risk assessments) undertaken in relation to Sydney Water's systems (whether or not the system is operated by Sydney Water) that will consider public health risks.

3 By 30 June 2018:

- in consultation with NSW Health, update and implement the risk assessment process to ensure adequacy of inputs to, and outputs from, the risk assessment and ensure inputs include a generalised process flow diagram and the attendance of relevant stakeholders
- in consultation with NSW Health, develop or update all system process flow diagrams against the requirements of Element 2, Component 1, Action 2 (A generalised flow diagram should be constructed describing the water supply system from catchment to consumer) of the Australian Drinking Water Guidelines, and
- use the process flow diagram currently being developed for the Nepean water filtration plant, to review the risk assessment for that plant.

Our auditor identified nine opportunities for improvement for clauses 2.1.1 and 2.1.2. These opportunities related to addressing inaccuracies and making other improvements to documentation. We have identified a further opportunity for improvement for these clauses:

OFI 2.1-1: As part of updating and implementing the risk assessment process ensure that the names of organisations in risk registers are current.

Further details of the opportunities for improvement identified by the auditor are available in the audit report in Appendix C.

Full Compliance (clause 2.1.5) with review of its public reporting on water quality

Our auditor assigned Sydney Water Full Compliance for clause 2.1.5 which requires Sydney Water to, by 31 December 2016, consult with its Customer Council and NSW Health, to 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. Sydney Water must provide IPART with a report detailing the outcomes of the review. We agree with this audit grade.

Our auditor noted that only the minimum requirements of Clause 2.1.5 of IPART's Reporting Manual were considered in the review, with the addition of:

- The requirements of the *Sydney Water Act 1994* related to the Consumer Confidence Report. This was chosen because it prescribes drinking water quality public reporting requirements which are additional to those in the Reporting Manual.
- Sydney Water's *Daily drinking water quality report*, which was chosen because it represents a substantial initiative for improving the transparency of public drinking water quality reporting.

The auditor considered that the choice of the additional items appeared sound and that it was sensible, where possible, to integrate reporting requirements to ensure effectiveness of time spent and message disseminated.

Our auditor identified one opportunity for improvement for Sydney Water to include a check to ensure that all required signatures are added to key documents before release.

High Compliance (clause 2.2.1) with maintaining a recycled water quality management system

Our auditor assigned Sydney Water High Compliance for clause 2.2.1, which requires Sydney Water to maintain a Management System that is consistent with the AGWR, except to the extent that NSW Health specifies otherwise. We agree with this audit grade.

Our auditor noted that Sydney Water was able to demonstrate that it had developed and maintained its Recycled Water Management System to be consistent with the AGWR. Sydney Water developed the *Recycled Water Management Manual*, scheme specific Recycled Water Quality Management Plans and a number of companion instruments. Together, these documents constituted a comprehensive recycled water quality management system package that closely followed the structure and content of the 12 elements of the AGWR. The result was a recycled water quality management system that, in all key respects, was tailor-made to comprehensively address every requirement of the AGWR that was relevant to Sydney Water operations.

The auditor found that generally there was strong alignment between the requirements of this clause and Sydney Water's compliance. Across some aspects of the recycled water management system there were a number of minor shortcomings that did not result in public health or environmental impacts during the audit period, including inaccuracies relating to flow diagrams and articulation of end user controls. Gaps were also noted in the identification of training and scheme governances.

Adequate Compliance (clause 2.2.2) with implementing a recycled water quality management system

Our auditor assigned Sydney Water Adequate Compliance for clause 2.2.2, which requires Sydney Water to ensure 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. We agree with this audit grade.

Our auditor noted that, generally, there was satisfactory implementation of the recycled water management system. Procedures, training in procedures and document management associated with procedures at Sydney Water's Liverpool Water Recycling Plant were found to be excellent.

However, our auditor found that there were shortcomings relating to Sydney Water's monitoring of end user controls and the surety of management of these controls. Minor shortcomings identified by our auditor included:

- The lack of a testable backflow prevention device on an unused recycled water connection (from the Liverpool Water Recycling Plant) at Liverpool Golf Club (which, if mistakenly connected, would have had the potential to draw recycled water into the drinking water system).
- No Operational Environment Management Plan (OEMP) for the Warwick Farm Race Course (which is supplied with recycled water from the Liverpool Water Recycling Plant).

- No evidence that Liverpool Golf Club or Warwick Farm Race Course (which are supplied with recycled water from the Liverpool Water Recycling Plant) were meeting their documented reporting, auditing and continual improvement obligations (for example, soil monitoring and water quality data provided did not align with sampling obligations under the OEMP).

Our auditor considered that these issues cut across a number of Sydney Water's implementation of the 12 elements in the AGWR Framework, thereby resulting in Sydney Water being assigned Adequate Compliance for this clause.

We make three recommendations to Sydney Water in relation to clauses 2.2.1 and 2.2.2, based on the auditor's recommendations and discussions with NSW Health.

Recommendations to Sydney Water

4 By 31 March 2018, complete a desktop review of the most recent compliance inspections for all end user sites to identify any outstanding high risk non-compliances and initiate appropriate action to address non-compliances, including interruption of supply where appropriate.

5 By 30 June 2018:

- in consultation with NSW Health, develop an interruption to supply process where end users are not meeting their obligations under their end user agreement or the Recycled Water Quality Management Plan
- 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, and
- review the role and associated competencies for Sydney Water staff and contractors who are responsible for verifying the on-site preventive measures.

6 By 30 June 2019:

- ensure Sydney Water staff and contractors who are responsible for verifying the on-site preventive measures are trained and assessed as competent to implement their responsibilities
- establish and implement a process for on-going competency assessment, and
- 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.

Our auditor identified one opportunity for improvement for clauses 2.2.1 and 2.2.2. This opportunity related to assessing the recycled water system maturity across the business. Further details of the opportunity for improvement are available in the audit report in Appendix C.

Adequate Compliance (clause 2.3.1) with the Fluoridation Code

Our auditor assigned Sydney Water Adequate Compliance for clause 2.3.1, which requires Sydney Water to comply with the Fluoridation Code. We agree with this audit grade.

Our auditor noted that there is sufficient evidence to confirm that Sydney Water has generally met the requirements apart from a number of minor shortcomings which do not compromise the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes. These shortcomings include:

- Sydney Water's incident response procedures do not refer to, and are inconsistent with, the Fluoridation Code and fluoride incident management protocols (Appendix C of the Fluoridation Code).
- Failure to submit exception reports (written notification) in some circumstances requiring notification to NSW Health.
- Internal audits did not assess compliance with the latest version of the Fluoridation Act, Regulation and the Fluoridation Code.
- The following deviations from the Fluoridation Code were observed at Nepean Water Filtration Plant:
  - the maximum physical dosing capacity of the fluoridation chemical feeding equipment was observed to be not limited to 110% of the operating target dose rate
  - the fluoride day tank was observed to be vented to a dry water trap
  - pipe markers were not observed on the temporary fluoride dosing pipework, and
  - a minimum of three months storage of fluoride was not observed.
- The following deviation from the Fluoridation Code was observed at Prospect Water Filtration Plant:
  - dust mask filters were observed that had not been changed within 13 weeks.

Our auditor noted that there was no evidence observed which indicated that any of these shortcomings resulted in a risk to public health.

We make one recommendation to Sydney Water in relation to clause 2.3.1, based on the auditor's recommendation.

Recommendation to Sydney Water

7 By 30 June 2018, ensure all Sydney Water fluoridation systems are designed, installed, and operated in accordance with the *NSW Code of practice for fluoridation of public water supplies 2011* (unless an exemption has been received from NSW Health), with particular reference to:

- ensuring the dosing capacity of the fluoride dosing equipment does not exceed 110% of the target dose rate
- ensuring water traps remain filled
- providing appropriate colour coding and marking of dosing pipes
- replacing dust mask filters every 13 weeks
- maintaining a minimum of three months storage of fluoridating agent or apply for an exemption from this minimum standard 8.2.1.1 from NSW Health
- ensuring emergency response plans are consistent with Appendix C of the *NSW Code of practice for fluoridation of public water supplies 2011*
- submitting written notifications to cover all periods of repair/maintenance, and
- ensure internal audits assess compliance with all relevant requirements of Chapter 5 of the *NSW Code of practice for fluoridation of public water supplies 2011*.

Our auditor identified one opportunity for improvement for clause 2.3.1. This opportunity related to the volume of fluoride storage Sydney Water should have available for dosing. Further details of the opportunity for improvement are available in the audit report in Appendix C.

2.3 Water quantity

Our auditor assigned Sydney Water Full Compliance for clauses 3.1.1, 3.2.2, 3.2.3 and 3.2.5. We agree with these audit grades.

Part 3 of the licence, Water quantity, outlines Sydney Water's obligations in relation to water security and conservation. These obligations arise through its roles and responsibilities protocol with the Metropolitan Water Directorate for the development and implementation of the Metropolitan Water Plan and the development of a methodology to determine and report on its Economic Level of Water Conservation (ELWC).

Under the risk-based auditing framework, we consider that this part of the licence poses a moderate risk with respect to likelihood and consequence of non-compliance.

Table 2.2 Compliance with Part 3 of the licence – Water quantity

Clause	Requirement	Compliance grading				
3	**Water quantity**	**2015-16[a]**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
3.1.1	Roles and responsibilities protocol	-	Full			
3.2.2	Economic level of conservation methodology (ELWC)	-	Full			
3.2.3	IPART approval for ELWC methodology	-	Full			
3.2.5	Water usage and leakage targets	Full	Full			

a IPART, *Sydney Water Corporation Operational Audit 2015-16 – Report to the Minister – Compliance Report*, December 2016.

Full Compliance (clause 3.1.1) with water quantity roles and responsibility protocol

Our auditor assigned Sydney Water Full Compliance for clause 3.1.1, which requires Sydney Water to use its best endeavours to develop and agree a Roles and Responsibilities Protocol (Protocol) with the Metropolitan Water Directorate for the development and implementation of the *Metropolitan Water Plan* and maintain and comply with the Protocol that has been developed and agreed upon. We agree with this audit grade.

Our auditor noted that both Sydney Water and the Metropolitan Water Directorate provided evidence supporting that best endeavours were being used to progress the development of the Protocol with the Metropolitan Water Directorate. Although the Protocol has not yet been signed, Sydney Water provided evidence through e-mail trails and staff work programs that demonstrated Sydney Water and the Metropolitan Water Directorate currently have a positive and co-operative working relationship, and are progressing the implementation of the Metropolitan Water Plan and associated projects.

Full Compliance (clause 3.2.2) with development of an ELWC methodology

Our auditor assigned Sydney Water Full Compliance for clause 3.2.2, which requires Sydney Water to develop a methodology for determining Sydney Water's ELWC in accordance with the approach and principles referred to in clause 3.2.1. We agree with this audit grade.

Our auditor noted that Sydney Water has developed a methodology for determining Sydney Water's ELWC titled *Determining Sydney Water's Economic Level of Water Conservation, Part A: The ELWC Methodology*. IPART has indicated its satisfaction that the methodology meets the licence requirements and is consistent with the approach and principles approved by IPART.

Full Compliance (clause 3.2.3) with IPART approval of the ELWC methodology

Our auditor assigned Sydney Water Full Compliance for clause 3.2.3, which requires Sydney Water to obtain IPART's approval for the ELWC methodology by 31 December 2016. We agree with this audit grade.

Our auditor noted that IPART issued a letter of approval for Sydney Water's ELWC methodology outlined in *Determining Sydney Water's Economic Level of Water Conservation, Part A: The ELWC methodology* on 21 December 2016.

Full Compliance (clause 3.2.5) with water usage and leakage targets

Our auditor assigned Sydney Water Full Compliance for clause 3.2.5, which requires Sydney Water to maintain the weather corrected quantity of drinking water usage to equal to or less than 329 litres per person per day and water leakage levels to below 121 megalitres per day. Sydney Water must also promote, foster and encourage the efficient use of water and the production and use of recycled water, where financially viable. We agree with this audit grade.

Our auditor was satisfied with the procedure and quality assurance associated with the data verification of the water usage level; was able to verify the water leakage level reported to IPART; and noted that Sydney Water continues to undertake a range of activities to promote, foster and encourage the efficient use of water and the production and use of recycled water (where financially viable).

The auditor identified one opportunity for improvement to review information provided to customers through its website to ensure the information is current. Further details of the opportunity for improvement are available in the audit report in Appendix C.

2.4 Assets

Our auditor assigned Sydney Water Full Compliance for clauses 4.1.1, 4.1.5, 4.2.1, 4.2.2, 4.2.3 and 4.3.1. We agree with these audit grades.

Part 4 of the licence, Assets, requires Sydney Water to develop an Asset Management System (AMS) that is consistent with the *International Standard ISO 55001:2014 Asset Management System – Requirements* by 30 June 2018. Until the AMS has been developed and certified, Sydney Water must continue to maintain and implement the current Asset Management Framework whilst transitioning to an ISO 55001:2014 compliant AMS. It also specifies the system performance standards for water pressure, water continuity and wastewater overflows that Sydney Water must comply with in a financial year and reporting obligations for response times for water main breaks and leaks.

Under the risk-based auditing framework, we consider that this part of the licence poses a moderate to very high risk with respect to likelihood and consequence of non-compliance.

Table 2.3 Compliance with Part 4 of the licence – Assets

Clause	Requirement	Compliance grading				
4	**Assets**	**2015-16[a]**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
4.1.1	Develop an AMS	-	Full			
4.1.5	Maintenance of current AMS	Full	Full			
4.2.1	Water pressure standard	-	Full			
4.2.2	Water continuity standard	-	Full			
4.2.3	Wastewater overflow standard	-	Full			
4.3.1	Response time for water main breaks	-	Full			

a IPART, *Sydney Water Corporation Operational Audit 2015-16 – Report to the Minister – Compliance Report*, December 2016.

Full Compliance (clause 4.1.1) with development of an asset management system

Our auditor assigned Sydney Water Full Compliance for clause 4.1.1, which requires Sydney Water to develop an Asset Management System (AMS) that is consistent with the *International Standard ISO 55001:2014 Asset Management System – Requirements* by 30 June 2018. We agree with this audit grade.

Our auditor noted that Sydney Water provided a satisfactory verbal update on its progress towards implementing the AMS by 30 June 2018 and detailed how the AMS was being implemented as part of an overall corporate management system.

Full Compliance (clause 4.1.5) with maintenance and implementation of current asset management framework

Our auditor assigned Sydney Water Full Compliance for clause 4.1.5, which requires Sydney Water to maintain and implement the current asset management framework while transitioning to the AMS. 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. 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. We agree with this audit grade.

Our auditor noted that Sydney Water continues to maintain and implement the Asset Management Framework as it transitions to an AMS in line with the requirements of *International Standard ISO 55001:2014 Asset Management System – Requirements*. The auditor found that Sydney Water made changes to its current asset management framework to facilitate this change. A sample of asset management plans and decision-making frameworks were reviewed by the auditor as part of the audit and a number of operational sites were visited to test the obligations of this clause.

Full Compliance (clause 4.2.1) with meeting the water pressure standard

Our auditor assigned Sydney Water Full Compliance for clause 4.2.1, which requires Sydney Water to ensure that it met the system performance standard for water pressure, as set out in its licence, in any financial year. We agree with this audit grade.

Our auditor noted that Sydney Water provided sufficient evidence to demonstrate that it was reporting its water pressure system performance standard in accordance with the reporting requirements and meeting the required level of performance specified in its licence. The auditor also noted that during this period there were no major large scale failures in Sydney Water's drinking water network and that the majority of detected and reported low pressure events were from recurrent sites.

Full Compliance (clause 4.2.2) with meeting the water continuity standard

Our auditor assigned Sydney Water Full Compliance for clause 4.2.2, which requires Sydney Water to ensure that it met the system performance standard for water continuity, as set out in its licence, in any financial year. We agree with this audit grade.

Our auditor noted that Sydney Water provided sufficient evidence to demonstrate that it was reporting its water continuity system performance standard in accordance with the reporting requirements and meeting the required level of performance specified in its licence.

Full Compliance (clause 4.2.3) with meeting the wastewater overflow standard

Our auditor assigned Sydney Water Full Compliance for clause 4.2.3, which requires Sydney Water to ensure that it met the wastewater overflow system performance standard as set out in its licence in any financial year. We agree with this audit grade.

Our auditor noted that Sydney Water provided sufficient evidence to demonstrate that it was reporting its wastewater overflow system performance standard in accordance with the reporting requirements and meeting the required level of performance specified in its licence.

Our auditor identified one opportunity for improvement for clause 4.2.3. This opportunity related to Sydney Water's categorisation of event codes and reporting for sewer overflows for all events (ie, to both public and private land) so that it can report accurately on sewer overflow events. Further details of the opportunity for improvement are available in the audit report in Appendix C.

Full Compliance (clause 4.3.1) with response time for water main breaks

Our auditor assigned Sydney Water Full Compliance for clause 4.3.1, which requires Sydney Water to report on response times for water main breaks and leaks in accordance with the Reporting Manual. We agree with this audit grade.

Our auditor noted that Sydney Water provided sufficient evidence that it reported response times for water main breaks and leaks in accordance with IPART's Reporting Manual.

2.5 Customers and consumers

Our auditor assigned Sydney Water Full Compliance for clauses 5.1.2, 5.2.4, 5.4.3 and 5.8. We agree with these audit grades.

Part 5 of the licence, Consumers and Customers, outlines Sydney Water's obligations in relation to customers and consumer rights, complaints and dispute handling.

Under the risk-based auditing framework, we consider that this part of the licence poses a low to medium risk with respect to likelihood and consequence of non-compliance.

Table 2.5 Compliance with Part 5 of the licence – Customers and consumers

Clause	Requirement	Compliance grading				
5	**Customers and consumers**	**2015-16[a]**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
5.1.2	Provide customer contract free of charge	-	Full			
5.2.4	Annual advertising of financial hardship account relief and rebate rights	NC	Full			
5.4.3	Provide an explanation of the Assistance Options for Payment Difficulties and Actions for Non-Payment free of charge	-	Full			
5.8	Code of conduct	-	Full			

a IPART, Sydney Water Corporation *Operational Audit 2015-16 – Report to the Minister – Compliance Report*, December 2016.

Note: NC = Non-Compliant.

Full Compliance (clause 5.1.2) with provision of customer contract free of charge

Our auditor assigned Sydney Water Full Compliance for clause 5.1.2, which requires Sydney Water to make a copy of the Customer Contract available to any person, free of charge, via its website or through its Contact Centre upon. We agree with this audit grade.

Our auditor noted that there were no updates to the Sydney Water website, Customer Contract section, during the audit period. There were 214 external downloads of the Customer Contract for the 2016-17 audit period. Sydney Water provided a Google Analytics overview for the dates 1 July 2016 to 30 June 2017 to show evidence of downloads.

The second part of this clause could not be tested specifically as there were no requests for copies of the Customer Contract entered into the Customer Management System during the audit period. Records of refresher training for complaints and contracts including the Customer Contract were therefore requested for December 2016, to establish that customer call centre staff understood the issue and that the fact that no requests for copies of the

Customer Contract was indeed real. Records of training and its content were provided and found to be adequate.

Full Compliance (clause 5.2.4) with annual advertising of financial hardship account relief and rebate

Our auditor assigned Sydney Water Full Compliance for clause 5.2.4, which requires Sydney Water to advertise 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. We agree with this audit grade.

Our auditor noted that Sydney Water met the requirement to advertise in a Sydney-based newspaper through advertising in the Sydney Morning Herald. Sydney Water also advertised in two other newspapers, these being the Daily Telegraph and the Illawarra Mercury, to ensure coverage of its area of operations.

Sydney Water's advertisement in all three newspapers covered the requirements of this clause to advertise on account relief options and the rights of customers to claim rebates (including the conditions).

Full Compliance (clause 5.4.3) with explaining assistance options for payment difficulties and actions for non-payment, free of charge

Our auditor assigned Sydney Water Full Compliance for clause 5.4.3, which requires Sydney Water to provide, free of charge, an explanation of the Assistance Options for Payment Difficulties and Actions for Non-Payment to:

- residential Customers, at least annually with their Bills
- 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
- any other person upon request made to the Contact Centre.

We agree with this audit grade.

Our auditor noted that Sydney Water had a *Payment Assistance Policy* in place which was in audit period and fulfilled the requirement for the explanation of the assistance options available for customers experiencing hardship. There was no specific section in the policy which clearly stated what the actions for non-payment would be. While not non-compliant, this aspect could be improved by including a link to the *Overdue payments and disconnections for non-payment policy* at Guiding Principle 3 in the *Payment Assistance Policy*.

Customers' water bills contained instructions on what to do if they have difficulty paying their bills. As the bills were sent out quarterly, Sydney Water met its requirement to provide the required information at least annually with their bills.

Evidence to show how Sydney Water records customer information and deals with identification of hardship is viewed through the Customer Management System. Records checked confirmed the process. Non-government Organisations (NGO) also referred

hardship customers to Sydney Water, which Sydney Water has trained and provided these NGOs with a checklist of identified hardships.

A Payment Assistance Scheme Procedure was in place and was current for the audit period.

Sydney Water's Customer Management System (CMS) does not currently include a field for identifying when a customer is first identified as experiencing hardship. It may be useful to consider adding such a field to the CMS.

Our auditor identified two opportunities for improvement clause for 5.4.3. The opportunities related to:

- Sydney Water referencing its *Overdue payments and disconnections for non-payment policy* in its *Payment Assistance Policy* at Guiding Principle 3, so that customers can see the suite of actions that Sydney Water may use.
- The addition of a field in Sydney Water's CMS which identifies the date a customer is identified as first experiencing financial hardship. The CMS does not currently include such a field.

Further details of the opportunities for improvement are available in the audit report in Appendix C.

Full Compliance (clause 5.8) with the code of conduct

Our auditor assigned Sydney Water Full Compliance for clause 5.8, which requires Sydney Water to 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 *Water Industry Competition (General) Regulation 2008*. We agree with this audit grade.

Our auditor noted that Sydney Water was made aware of Network operators and Retail Suppliers through two avenues, these being notification by IPART of *Water Industry Competition (Act) 2006* (WIC Act) licence applications and approaches to Sydney Water by the licensee itself. Our auditor was provided with evidence which confirmed that both of these avenues were utilised. Further, Sydney Water provided evidence to show that it kept a record of WIC Act licensees and their interactions with Sydney Water. Sydney Water interpreted its licence requirement of using 'best endeavours' to mean:

- to negotiate in good faith, and
- to respond to requests to establish a code of conduct in a timely manner.

Our auditor agreed that Sydney Water has formed a reasonable interpretation of 'best endeavours'.

Sydney Water noted that it was not required to proactively seek to establish codes of conduct if such a request had not been made from a licensed Network operator or licensed Retail Supplier. Our auditor agreed (and confirmed with IPART) that, given the wording of the licence clause, this interpretation was reasonable.

Our auditor also noted that Sydney Water considered the typical arrangement between Sydney Water and a WIC Act licensee is via a Utility Services Agreement (USA) with the licensee, rather than a code of conduct. IPART confirmed:

> "…that in the absence of a water industry code of conduct under cl 25 of the *Water Industry Competition (General) Regulation 2008*, where a Utilities Service Agreement (or any other agreement) between a public water utility and WIC Act licensee includes the requirements of the standard WIC Act licence condition B10, IPART considers it to have met the requirements of a code of conduct."

There are currently several USAs in force. The commercial agreements in place between the two parties include operating protocols and regular communication via email and meetings. Information was provided to our auditor to demonstrate evidence of communication.

2.6 Quality management

Our auditor assigned Sydney Water Full Compliance for clause 7.1.1. We agree with this audit grade.

Part 7 of the licence, Quality management, outlines the obligation for Sydney Water to develop a Management System that is consistent with the *Australian Standard AS/NZS ISO 9001:2008: Quality Management Systems - Requirements* (the Quality Management System) by 30 June 2017.

Under the risk-based auditing framework, we consider that this part of the licence poses a low risk with respect to likelihood and consequence of non-compliance.

Table 2.6 Compliance with Part 7 of the licence – Quality management

Clause	Requirement	Compliance grading				
7	**Quality management**	**2015-16[a]**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
7.1.1	Develop a Management System that is consistent with AS/NZS ISO 9001:2008	-	Full			

a IPART, Sydney Water Corporation *Operational Audit 2015-16 – Report to the Minister – Compliance Report*, December 2016.

Full Compliance (clause 7.1.1) with quality management system

Our auditor assigned Sydney Water Full Compliance for clause 7.1.1, which requires Sydney Water to develop a Management System that is consistent with the Australian Standard *AS/NZS ISO 9001:2008: Quality Management Systems - Requirements (the Quality Management System)* by 30 June 2017. We agree with this audit grade.

Our auditor noted that Sydney Water has developed a quality management system consistent with ISO 9001:2015. While Sydney Water has implemented a system consistent with a later version of the ISO 9001 standard, this is still consistent with the licence requirement. Sydney Water currently holds certification to ISO 9001:2015 for its Information Management System for Delivery of Products and Services to Customers. . It developed a

portal for its QMS which could be accessed internally by clicking on the QMS 'Cog'. Each component of the QMS 'Cog' links through to processes and procedures relevant to the clauses of ISO 9001:2015 and Sydney Water's business processes. This QMS 'Cog' forms the quality model for the business. Sydney Water conducted a gap assessment of the standard and documented how they met the requirements of the standard.

Our auditor identified one opportunity for improvement for clause 7.1.1. The opportunity related to Sydney Water considering the use of specialist technical auditors for relevant components of Sydney Water's business eg, Exemplar Global Water Quality Management Systems auditors. Further details of the opportunity for improvement are available in the audit report in Appendix C.

2.7 Performance Monitoring

Our auditor assigned Sydney Water High Compliance for clause 8.4.1. We agree with this audit grade.

Part 8 of the licence, Performance monitoring, requires Sydney Water to measure accurately its performance against the performance indicators and system performance standards specified in the Reporting Manual.

Under the risk-based auditing framework, we consider that this part of the licence poses a moderate risk with respect to likelihood and consequence of non-compliance.

Table 2.7 Compliance with Part 8 of the licence – Performance monitoring

Clause	Requirement	Compliance grading				
8	**Performance monitoring**	**2015-16[a]**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
8.4.1	Performance indicators and system performance standards	-	High			

a IPART, *Sydney Water Corporation Operational Audit 2015-16 – Report to the Minister – Compliance Report*, December 2016.

High Compliance (clause 8.4.1) with measuring performance indicators and system performance standards

Our auditor assigned Sydney Water High Compliance for clause 8.4.1, which requires Sydney Water to 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. We agree with this audit grade.

Our auditor noted that one performance indicator (I5) had been incorrectly reported due to a misunderstanding of the reporting definition. While Sydney Water had considerable management processes and procedures in place, these had apparently not prevented indicator I5 being incorrectly reported.

In trailing work order records to Maximo (an enterprise asset management system used by Sydney Water), our auditor noted that one important work order time field (overflow ceased) was not being routinely recorded, and for a small subset of records, a lesser level of information had been collected. While our auditor did not consider that any performance data had been incorrectly reported or had an obvious bias, it considered that the issues identified call into question the sufficiency of Sydney Water's record systems for the purpose of performance reporting.

Our auditor commented that while the above minor shortcomings do not compromise Sydney Water's overall compliance with the objective of this clause, it was concerned with the quality control and sufficiency of work order data collected in the field. It is for this reason that our auditor assigned High Compliance for this clause.

We make three recommendations to Sydney Water in relation to clause 8.4.1, based on the auditor's recommendations.

Recommendations to Sydney Water

8 By 31 March 2018:

- review its reporting process for infrastructure indicator I5 to provide assurance for future reported data, and
- evaluate the data it has historically reported for indicator I5 and report corrected data if necessary.

9 By 30 June 2018:

- assess whether its current processes for capturing site evidence for sewage overflow events and its compliance with its processes is sufficient for its business processes, and
- demonstrate that it has in place an appropriate audit trail for events where the priority has been changed.

10 By 31 December 2018, put in place appropriate measures to ensure that overflow ceased times are recorded accurately in future.

2.8 Memorandum of understanding

Our auditor assigned Sydney Water Full compliance for clauses 9.1.1, 9.1.3, 9.2.1 and 9.3.1. We agree with these audit grades.

Part 9 of the licence, Memorandum of understanding, outlines the obligation for Sydney Water to maintain relationships with NSW Health, Environment Protection Authority and the Water Administration Ministerial Corporation.

Under the risk-based auditing framework, we consider that this part of the licence poses a low risk with respect to likelihood and consequence of non-compliance.

Table 2.8 Compliance with Part 9 of the licence – Memorandum of understanding

Clause	Requirement	Compliance grading				
9	**Memorandum of understanding**	**2015-16[a]**	**2016-17**	**2017-18**	**2018-19**	**2019-20**
9.1.1	Maintain a Memorandum of understanding with NSW Health	Full	Full			
9.1.3	Include arrangements for reporting to NSW Health on events that may pose a risk to public health	-	Full			
9.2.1	Maintain a Memorandum of understanding with Environment Protection Authority	-	Full			
9.3.1	Maintain a Memorandum of understanding with Water Administration Ministerial Corporation	-	Full			

a IPART, *Sydney Water Corporation Operational Audit 2015-16 – Report to the Minister – Compliance Report*, December 2016.

Full Compliance (clause 9.1.1) with Memorandum of understanding with NSW Health

Our auditor assigned Sydney Water Full compliance for clause 9.1.1, which requires Sydney Water to maintain the Memorandum of understanding (MOU) with NSW Health. We agree with this audit grade.

Our auditor noted that NSW Health advised that they "maintain an effective and open relationship with Sydney Water at officer and strategic levels" and that they were satisfied Sydney Water had met its obligations relevant to water quality under the MOU.

Full compliance (clause 9.1.3) with reporting arrangements with NSW Health

Our auditor assigned Sydney Water Full Compliance for clause 9.1.3, which requires 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. We agree with this audit grade.

Our auditor noted that it audited Sydney Water's drinking and recycled water emergency response plans, including notifications, as part of Part 2 (Water Quality) and that these aspects (Element 6 within the ADWG and AGWR frameworks) were found to be fully compliant.

Full compliance (clause 9.2.1) with Memorandum of understanding with Environment Protection Authority

Our auditor assigned Sydney Water Full Compliance for clause 9.2.1, which requires Sydney Water to maintain the Memorandum of understanding (MOU) with the Environment Protection Authority (EPA). We agree with this audit grade.

The MOU with the EPA set out structures including a CEO meeting, a Strategic Liaison Group, a Joint Operational Group and processes including joint forums, programs and initiative and exchange of information and data.

Our auditor noted that Sydney Water provided evidence, including agenda and meeting minutes, which demonstrated that it had met with the EPA, as required, and covered the issues within the scope of the MoU.

Full Compliance (clause 9.3.1) with Memorandum of understanding with Water Administration Ministerial Corporation

Our auditor assigned Sydney Water Full Compliance for clause 9.3.1, which requires Sydney Water to maintain the Memorandum of understanding (MOU) with the Water Administration Ministerial Corporation (WAMC). We agree with this audit grade.

Sydney Water maintained the MOU with WAMC. The MOU set out functions and objectives of the two organisations, including a consultation process where the parties may liaise and keep each other informed. However there was no obligation for regular meetings.

Our auditor noted that Sydney Water's communication with the then Department of Primary Industries Water (DPI Water) during the audit period was focused on renewing the MOU.[7] Proposed MOU changes were made to the MOU in November 2015 due to a name change from NSW Office of Water to DPI Water. The document had been with DPI Water until 22 June 2017 when Sydney Water received an updated copy from DPI Water. This version of the MOU was in the process of being approved.

DPI Water was contacted to comment on the audit. In their response they noted the request to review to MOU was focussed on administrative changes.

7 At the time, DPI Water undertook the functions of WAMC.

3 Progress on previous audit recommendations

The previous audit in 2015-16 identified areas where Sydney Water's performance with its licence obligations did not receive Full Compliance. We previously made recommendations to the Minister to address these issues.[8] The following table outlines Sydney Water's progress in implementing these recommended actions.

Sydney Water completed two out of three outstanding recommendations from the previous audit (Table 3.1). One recommendation is ongoing.

For the outstanding recommendation 2015/16-3, we will follow it up in 2017-18, together with the recommendations from this year's audit.

Table 3.1 Sydney Water's progress in 2016-17 to address our recommendations from the previous audit

	Recommendation	Progress
2015/16-1: clause 1.9.1	Sydney Water should complete, register and apply the Development Servicing Plan for the Oran Park/Turner Road development (by 30 June 2017).	**Complete** This was a new recommendation in 2015-16. Sydney Water has completed and adopted the Oran Park/Turner Road Development Servicing Plan (DSP). On 5 April 2017, the NSW Treasurer approved Sydney Water's request to cap the developer charges at a price that is lower than the price using the methodology in IPART's *Recycled water developer charges, Determination No. 8, 2006*. The DSP was registered by IPART on 28 June 2017.
2015/16-2: clause 2.2.2	Sydney Water should review recycled water monitoring requirements in consultation with NSW Health to confirm that all validated UV units are operating within their UVT validation envelope, appropriate to the dose monitoring strategy in place (by 30 March 2018).	**Ongoing** This recommendation was a new recommendation in 2015-16 that captured the remaining tasks of recommendation 2014-15-4 from the 2015-16 audit of Sydney Water. Sydney Water provided ultraviolet transmissivity (UVT) performance assessment reports for the Rouse Hill, Castle Hill and Wollongong (Stage 2) Water Recycling Plants (WRP). All the UVT samples for Rouse Hill were above the validated UVT upper limit of 70%. The Wollongong ultraviolet radiation (UV) unit had one sample out of seven that was below the validated UVT range and Castle Hill had two samples out of ten that were below the validation limit of 65%. Sydney Water also

8 IPART, *Sydney Water Operational Audit 2015-16 Report to the Minister – Compliance Report*, December 2016.

		conducted verification testing of the UV units. NSW Health has advised that to date it has been sufficiently consulted with respect to this recommendation and their understanding is that work by Sydney Water is ongoing to meet the deadline of 30 March 2018. Sydney Water has made good progress on this recommendation and it is on track to meet the March 2018 deadline.
2015/16-3: clause 5.2.4	By 30 June 2017 Sydney Water should develop and implement a procedure or process to ensure that it advertises in a Sydney-based newspaper at least once each year on: 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.	**Complete** This was a new recommendation in 2015-16. Sydney Water provided several pieces of evidence to support this recommendation. (More detailed discussion on this aspect is covered in the Detailed Evidence section of the auditor's report (see Table B-23 in Appendix C). The auditor confirmed that the Folio of Progress for Sydney Water's Customer Contract now contains the requirement for individual business units to update workplans to include advertising on types of financial assistance. The folio is reviewed 6 monthly and this constitutes the process. Line item 123 of the workplan shows where the advertising requirement has been programmed, which provides evidence that the process is being implemented in practice. The auditor confirmed that for the 2016-17 period, advertisements detailing the types of financial assistance options available and the rights of customers to claim rebates were placed in the Sydney Morning Herald, Daily Telegraph and Illawarra Mercury on Wednesday 15 February 2017.

Our auditor found that two of the three previous recommendations, recommendations 2015/16-1 and 2015/16-3, were completed during 2016-17 in accordance with the due dates.

Sydney Water demonstrated reasonable effort in completing the audit recommendations.

Appendices

A Compliance grades

Compliance grades for public utilities

Grades of compliance	Description
Full Compliance 	Sufficient evidence to confirm that the requirements have been fully met.
High Compliance 	Sufficient evidence to confirm that the requirements have generally been met apart from **very few minor shortcomings** which do not compromise the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.
Adequate Compliance 	Sufficient evidence to confirm that the requirements have generally been met apart from **a number of minor shortcomings** which do not compromise the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes
Non compliant 	Sufficient evidence has **not** been provided to confirm that all major requirements are being met and the deficiency adversely impacts the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.
No Requirement 	The requirement to comply with the licence condition does not occur within the audit period or there is no requirement for the utility to meet this assessment criterion.

B 2016-17 audit scope

2016-17 Operational Audit scope
Sydney Water Corporation

Contents

2016-17 audit scope

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.

Previous recommendations

Table 2 outlines outstanding audit recommendations. These recommendations are reviewed to determine progress and are reported on separately within the audit report.

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.

Table 1 Key

Requirement	Meaning
Audit/Review	Audit/review clause in 2016-17
SC	We will rely on the utility's Statement of Compliance. All clauses require a Statement of Compliance unless there is a "no requirement" designation.
NR	No requirement (for audit or statement of compliance).

Table 2 2016-17 Audit scope for Sydney Water Corporation

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
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: 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.	NR	
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)).	NR	
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.	NR	

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
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.	NR	
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.	NR	
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.	SC	

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
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	This condition was last audited in 2015-16 and was non-compliant. See recommendation 2015-16-1 for comments. In March 2017, Sydney Water self-reported as non-compliant in the 2016-17 year.
2	Water quality		
2.1	Drinking water		
2.1.1	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**). [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). 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.]	Audit	This clause was last audited in 2015-16 and was awarded Full Compliance. The system must be consistent with the ADWG except to the extent that NSW Health specifies (specification from NSW Health must be consistent with the requirements of clause 2.1.4). NSW Health will be contacted by the Auditor to comment on compliance with this clause.
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	This clause was last audited in 2015-16 and was awarded Full Compliance. Evidence must demonstrate that a compliant system was in place for the whole period to award Full Compliance. NSW Health will be contacted by the Auditor to comment on compliance with this clause.
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	Audit following notice of change. NSW Health will be contacted by the Auditor to comment on compliance with this clause and/or inclusion in the scope.
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	NSW Health will be contacted by the Auditor to comment on compliance with this clause and/or inclusion in the scope.

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
2.1.5	By 31 December 2016, Sydney Water must: 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).	Audit	NSW Health will be contacted by the Auditor to comment on compliance with this clause.
2.2	Recycled water		
2.2.1	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**). *[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.]*	Audit	This clause was last audited in 2015-16 and was awarded Full Compliance in that audit. Audit will include a risk based adequacy audit of the system, and implementation of the system. Related recommendations were made and should be audited in accordance with Table 3 below. Deviations from the AGWR should be in accordance with pre-approved requirements of clause 2.2.4. NSW Health will be contacted by the Auditor to comment on compliance with this clause.
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	This clause was last audited in 2015-16 and was awarded High Compliance in that audit. Evidence must demonstrate that a compliant system was in place for the whole period to award Full Compliance. NSW Health will be contacted by the Auditor to comment on compliance with this clause.
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	The RWQMS is subject to continuous review. Changes considered to be 'significant' should be reported in accordance with this clause. NSW Health will be contacted by the Auditor to comment on compliance with this clause, and/or inclusion in the scope

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
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	Audit if required. If the auditor finds non-compliances with the AGWR. Approval from NSW Health must be demonstrated. NSW Health will be contacted by the Auditor to comment on compliance with this clause, and/or inclusion in the scope.
2.3	Fluoridation code		
2.3.1	Sydney Water must comply with the Fluoridation Code.	Audit	
3	Water Quantity		
3.1	Roles and Responsibilities Protocol		
3.1.1	Sydney Water must use its best endeavours to: 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).	Audit	The Metropolitan Water Directorate (Department of Planning and Environment) will be contacted by the Auditor to comment on compliance with this clause.
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: 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.	Audit	
3.2.3	By 31 December 2016, Sydney Water must obtain IPART's approval for the Methodology.	Audit	
3.2.4	Once the Methodology is approved by IPART, Sydney Water must, from the date that such approval is given: 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	2016-17 audit requirement	Comments
3.2.5	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: 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.	Audit	This clause was last audited in 2015-16 and was awarded Full Compliance.
3.2.6	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. *[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.]*	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**).	Review	Until the system is developed, a verbal update of progress will be reviewed at the audit and documented by the auditor. Any potential issues should be identified in this update.
4.1.2	Sydney Water must ensure that: 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.	NR	

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
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.	NR	
4.1.5	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: 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	This clause was last audited in 2015-16 and was awarded Full Compliance.

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
4.2	System Performance Standards		
4.2.1	Water Pressure Standard 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: 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: 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: 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	Audit	

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
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; and 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). 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. 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). d) For the purpose of the Water Continuity Standard: i) each separately billed part of a Multiple Occupancy Property is to be counted as a separate Property; 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 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.	Audit	

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
4.2.3	Wastewater Overflow Standard a) Sydney Water must ensure that, in any financial year: i) no more than 14,000 Properties (other than Public Properties) experience an Uncontrolled Wastewater Overflow in dry weather; and ii) no more than 175 Properties (other than Public Properties) experience three or more Uncontrolled Wastewater Overflows in dry weather (the Wastewater Overflow Standard). b) For the purpose of the Wastewater Overflow Standard: i) each Multiple Occupancy Property is to be counted as a single Property; *[Note: For example, a complex of five townhouses where each townhouse receives a separate bill from Sydney Water is to be counted as a single Property.]* 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 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.	Audit	
4.2.4	Interpretation of standards 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.	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.	Audit	
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	Audit if triggered by a review
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	Audit if triggered by a Ministerial direction.

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
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: a) on its website for downloading; and b) upon request made to the Contact Centre.	Audit	
5.2	Providing information		
5.2.1	Sydney Water must prepare a pamphlet that: 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: a) provide the pamphlet prepared under clause 5.2.1 and pamphlet updates made under clause 5.2.2, free of charge to: i) Customers at least annually with their Bills; and ii) any person upon request made to the Contact Centre; and b) make the 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	2016-17 audit requirement	Comments
5.2.4	Sydney Water must advertise in a Sydney-based newspaper at least annually on: 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	This clause was last audited in 2015-16 and was found to be non-compliant.
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	Sydney Water must maintain and fully implement: 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 *Assistance Options for Payment Difficulties and Actions for Non-Payment*).	SC	
5.4.2	Sydney Water must set out, in the Customer Contract: 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	2016-17 audit requirement	Comments
5.4.3	Sydney Water must provide, free of charge, an explanation of the Assistance Options for Payment Difficulties and Actions for Non-Payment to: 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	
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	2016-17 audit requirement	Comments
5.5.3	Sydney Water must: 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: 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	2016-17 audit requirement	Comments
5.5.4	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: 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	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: 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.	SC	

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
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 Handing Procedure).	SC	
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	SC	
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: 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: 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: 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.	Audit	

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
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	Sydney Water must: 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.	SC	
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 *Australian Standard AS/NZS ISO 9001:2008: Quality Management Systems - Requirements* (the **Quality Management System**).	Audit	This clause was subject to Review in the 2015-16 audit and no potential issues were identified.
7.1.2	Sydney Water must ensure that: a) by 30 June 2018, the Quality Management System is certified by an appropriately qualified person to be consistent with the *Australian Standard AS/NZS ISO 9001:2008: Quality Management Systems – Requirements*; 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.	NR	

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
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	Audit if triggered
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: 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	2016-17 audit requirement	Comments
8.2	Reporting		
8.2.1	Sydney Water must comply with its reporting obligations set out in the Reporting Manual, which include: 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	
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	NR	
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.	NR	
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.	NR	
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.	NR	
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. *[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.]*	SC	NSW Health will be contacted by the Auditor to comment on compliance with this clause, and/or inclusion in the scope.

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
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.	Audit	The IPART Indicators – Infrastructure will be audited.
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.	Audit	This clause was last audited in 2015-16 and was awarded Full Compliance. NSW Health will be contacted by the Auditor to comment on compliance with 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	This clause was last audited in 2015-16 and was awarded Full Compliance.
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.	Audit	NSW Health will be contacted by the Auditor to comment on compliance with 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.	Audit	NSW EPA will be contacted by the Auditor to comment on compliance with 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	

Licence clause	Operating Licence obligation	2016-17 audit requirement	Comments
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.	Audit	WAMC will be contacted by the Auditor to comment on compliance with this clause.
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.	SC	
9.4.3	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: 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	2016-17 audit requirement	Comments
9.4.4	The memorandum of understanding referred to in clause 9.4.1 must require: 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): 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. *[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.]*	SC	
10	End of Term Review		
10.1	End of Term Review		
10.1.1	It is anticipated that a review of this Licence will commence in the first quarter of 2019 to investigate: 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	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.	NR	

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	2015-16 audit findings, and status as reported by utility on 31 March 2017[a]	Guidance for 2016-17 audit
2015-16-1	1.9.1 Licence and Licence Authorisation - Pricing	Sydney Water should complete, register and apply the Development Servicing Plan for the Oran Park/Turner Road development (by 30 June 2017).	New recommendation in 2015-16. A draft Development Servicing Plan (DSP) for the Oran Park/Turner Road recycled water scheme has been developed and is on track to be displayed for public consultation for 30 working days. Once the exhibition period is complete, Sydney Water can adopt the DSP and register it with IPART prior to the 30 June 2017 deadline. As part of the DSP process, Sydney Water has requested approval from the NSW Treasurer to cap the developer charges at a price that is lower than the price using the methodology in IPART's Recycled water developer charges, Determination N0. 8, 2006 (The 2006 Determination).	Auditor to check for completeness.

Recommendation number	Operational issue (licence reference where applicable)	IPART's recommendation to the Minister	2015-16 audit findings, and status as reported by utility on 31 March 2017[a]	Guidance for 2016-17 audit
2015-16-2	2.2.2 Water Quality – Recycled Water	Sydney Water should review recycled water monitoring requirements in consultation with NSW Health to confirm that all validated UV units are operating within their UVT validation envelope, appropriate to the dose monitoring strategy in place (by 30 March 2018)	Significant progress has been made towards recommendation 2014-15-4. The remaining tasks have been captured in a new recommendation 2015-16-2. Regular monitoring of ultraviolet transmittance (UVT) has commenced to collect preliminary information and inform a more in depth review of ultraviolet radiation (UV) unit operation against validated UVT envelopes. This review will confirm the appropriateness of dose strategies in place and inform any required changes. The review will be undertaken in consultation with NSW Health. The performance of pathogen inactivation in UV units is also being assessed during Log Reduction Value (LRV) verification monitoring. This monitoring is rolled out on a scheme-by-scheme basis as per the LRV verification program.	Auditor to consider progress to date, however completion date is out of audit scope.

Recommendation number	Operational issue (licence reference where applicable)	IPART's recommendation to the Minister	2015-16 audit findings, and status as reported by utility on 31 March 2017[a]	Guidance for 2016-17 audit
2015-16-3	5.2.4 Customers and Consumers – Providing Information	By 30 June 2017 Sydney Water should develop and implement a procedure or process to ensure that it advertises in a Sydney-based newspaper at least once each year on: 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.	New recommendation in 2015-16. Sydney Water's Customer Services and Corporate and Public Affairs teams have updated their individual business unit work plans to include the advertising of the types of financial assistance options available and the rights of customer to claim rebates. Sydney Water's Folio of Progress for the Customer Contract (which tracks the progress against this Ministerial requirement) has now been amended to include reference to this process. This serves as a reminder when folios are updated at 31 December each year. For the 2016-17 period, the advertisements detailing the types of financial assistance options available and the rights of customer to claim rebates were placed in the Sydney Morning Herald, Daily Telegraph and Illawarra Mercury on Wednesday 15 February 2017, demonstrating compliance with this clause.	Auditor to check progress

Source: Sydney Water Corporation 31 March Report

Table 4 Previous field verification locations for Sydney Water Corporation

Audit year	Location	Facility
2015-16	Orchard Hill	Water filtration plant
	Preston	Maintenance Depot
	Cronulla	Wastewater Treatment Plant
2014-15	Parklea	Reservoir
	Box Hill	Pumping station
	North Richmond	Water filtration plant
	Rouse Hill	Water recycling plant
2013/14	West Camden	Water recycling plant
	Warragamba	Water filtration plant
		South West Growth Area
2012/13	Macarthur	Macarthur Water Filtration Plant
	Liverpool	Customer service centre
	Liverpool	Liverpool recycling plant
	West Hoxton	Priority Sewage Project
2011/12	Wollongong	Recycled water treatment plant
	Woronora	Water filtration plant
	Heathcote	Reservoir
2010/11	N/A	3 treated water reservoirs
	Orchard Hills	Water filtration plant
	Drummoyne	Mains flushing

C Auditor's operational audit report 2016-17 – Sydney Water

Sydney Water Corporation

Operational Audit

IPART

Date: November 2017

Version: 4.00

Final Report

TECHNICAL FACILITATION SPECIALISTS

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Executive Summary

Auditor declaration

This report presents the findings of the audit of the *Sydney Water Operation Licence 2015-2020* and the *Sydney Water Act 1994* (NSW), consistent with audit requirements set out in IPART's *Audit Guideline Public Water Utilities* (May 2016) for the period 1 July 2016 to 30 June 2017.

The auditors confirm that:

- we have seen sufficient evidence on which to base our conclusions
- our audit findings accurately reflect our professional opinions
- we have conducted the audit, determined audit findings and prepared the report consistent with audit requirements set out in IPART's *Audit Guideline Public Water Utilities* (May 2016) and IPART's Request for Quote
- the audit findings have not been unduly influenced by the utility and/or any of its associates.

Major findings

A summary of major audit findings for the 2016/2107 audit period is shown in Table i-i.

Table i-i. Summary of audit findings against audited licence obligations

Section	Clause	Sub clauses	Major findings
1. Licence and licence authorisation	1.9. Pricing	1.9.1	Non-compliant – Sydney Water has self-reported four non-compliances with this clause.
2. Water quality	2.1. Drinking water	2.1.1	High compliance – There was no clear direction to develop a conceptual flow diagram consistent with Element 2 Framework requirements.
		2.1.2	Adequate compliance – Flow diagrams that did exist were not fully Framework-compliant. It was difficult to track if risk registers had been reviewed in practice given that out of date agency names were still included in a revised register.
		2.1.5	Full compliance
	2.2. Recycled water	2.2.1	High compliance – Inaccuracies were identified relating to field verification of flow diagrams and articulation of end user controls. Gaps were noted in the identification of training and scheme governances
		2.2.2	Adequate compliance – Shortcomings were identified relating to monitoring of end user controls and the surety of management of these controls.
	2.3. Fluoridation code	2.3.1	Adequate compliance – Compliance with the *NSW Code of practice for fluoridation of public water supplies 2011* was generally met, though there were a number of minor shortcomings including adequacy of emergency response plans for overdosing incidents, notification to NSW Health, internal audit scope, storage of fluoride, and minor operational issues.
3. Water quantity	3.1 Roles and responsibilities protocol	3.1.1	Full compliance
		3.2.2	Full compliance

Section	Clause	Sub clauses	Major findings
	3.2 Economic level of water conservation	3.2.3	Full compliance
		3.2.5	Full compliance
4. Assets	4.1 Asset Management System	4.1.1	Full compliance
		4.1.5	Full compliance
	4.2 System Performance Standards	4.2.1	Full compliance
		4.2.2	Full compliance
		4.2.3	Full compliance
	4.3 Response time for water main breaks	4.3.1	Full compliance
5. Customers and consumers	5.1 Customer contract	5.1.2	Full compliance
	5.2 Providing information	5.2.4	Full compliance
	5.4 Assistance options for payment difficulties and actions for non-payment	5.4.3	Full compliance
	5.8 Code of conduct		Full compliance
7. Quality Management	7.1 Quality Management System	7.1.1	Full compliance
8. Performance monitoring	8.4 Performance indicators and system performance standards	8.4.1	High compliance – Indicator (I5) had been incorrectly reported due to a misunderstanding of the reporting definition.
9. Memorandum of understanding	9.1 NSW Health	9.1.1	Full compliance
		9.1.3	Full compliance
	9.2 Environment Protection Authority	9.2.1	Full compliance
	9.3 Water Administration Ministerial Corporation	9.3.1	Full compliance

Besides the self-declared non-compliance, we sampled sufficient evidence to form an opinion that the shortcomings found as part of the audit did not adversely impact the ability of Sydney Water to achieve defined objectives and assure controlled processes and outcomes during the audit date scope. A summary of assessed progress against previous audit recommendations is shown in Table i-ii.

Table i-ii. Summary of assessed progress of previous audit recommendations

Recommendation	Sub clauses	Audit finding
2015-16-1: 1.9.1 Licence and Licence Authorisation - Pricing	Sydney Water should complete, register and apply the Development Servicing Plan for the Oran Park/Turner Road development (by 30 June 2017).	Satisfactorily addressed, considered closed.
2015-16-2: 2.2.2 Water Quality –Recycled Water	Sydney Water should review recycled water monitoring requirements in consultation with NSW Health to confirm that all validated UV units are operating within their UVT validation envelope, appropriate to the dose monitoring strategy in place (by 30 March 2018).	In progress - Sydney Water has made good progress on this recommendation and the recommendation is on track to meet the March 2018 deadline.

Recommendation	Sub clauses	Audit finding
2015-16-3: 5.2.4 Customers and Consumers – Providing Information	By 30 June 2017 Sydney Water should develop and implement a procedure or process to ensure that it advertises in a Sydney-based newspaper at least once each year on: 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.	Satisfactorily addressed, considered closed.

Recommendations

Recommendations arising from the Sydney Water 2016/2017 operational audit are shown in Table i-iii.

Table i-iii. Operational audit 2016/2017 recommendations

Section	Clause	Recommendations
1. Licence and licence authorisation	1.9. Pricing	**Recommendation 1.9-1:** By 31st March 2018 Sydney Water should ensure that substance charges for commercial customers are charged according to the determination[1] to three decimal places. **Recommendation 1.9-2:** By 30th June 2018 Sydney Water should develop and implement an auditable quality assurance process to confirm the accuracy of data entry of set fees.
2. Water quality	2.1. Drinking water	**Recommendation 2.1-1:** By 30th June 2018, develop and/or review and update all conceptual system process flow diagrams against the requirements of Element 2, Component 1, Action 2 (A generalised flow diagram should be constructed describing the water supply system from catchment to consumer). The diagram should outline all steps and processes, whether or not they are under control of the drinking water supplier; summarise the basic characteristics of each component; make explicit any characteristics that are unique to the system; be verified by field audits and checked by those with specific knowledge of the system. Development and implementation of a checklist may facilitate conduct of this recommendation. **Recommendation 2.1-2:** By 30th June 2018, update and implement the risk assessment process to ensure adequacy of inputs to, and outputs from, the risk assessment. Inputs should include, but not be limited to, documentation of contextual system information which may impact on risks (e.g. whether a recycled water scheme is within the system area, whether other utilities operate within the system area, whether there is a raw water distribution system within the area, whether there are water carter filling stations etc), a Framework-compliant flow diagram and the need for attendance of external stakeholders (NSW Health). The outputs should contain current agency names and reviewed risks reflect the specific system being assessed. **Recommendation 2.1-3:** By 30th June 2018, use the flow diagram currently being developed for the Nepean water filtration plant, to review the risk assessment for that plant. As part of the review, ensure that agency names are corrected to reflect current conditions (e.g. Sydney Catchment Authority vs WaterNSW).

[1] Determination No. 5, 2016 Maximum prices for Sydney Water Corporation's water, sewerage, stormwater drainage and other services (IPART 2016)

Section	Clause	Recommendations
	2.2. Recycled water	**Recommendation 2.2-1:** By 30th June 2018, determine the required tasks and associated competencies for Sydney Water staff (both frontline and managers) and contractors who are responsible for confirming the efficacy of on-site public health and environmental preventive measures as documented in the recycled water management system and supporting material. **Recommendation 2.2-2:** By 30th June 2018, ensure Sydney Water staff (frontline and managers) and contractors who are responsible for confirming the efficacy of on-site measures are trained and assessed as competent to implement their responsibilities. This includes: • competencies to confirm customer compliance with the Recycled Water Agreements and RWQMP • competencies to follow procedures and complete appropriate records. A process for on-going competency assessment should be established and implemented. **Recommendation 2.2-3:** By 30th June 2018, ensure compliance inspections are undertaken with sufficient rigour to provide confidence that end user control requirements (Schedule 3 Purchaser Controls) are being met. **Recommendation 2.2-4:** a) By 31st March 2018, develop an interruption to supply process where end users are not meeting their obligations under their end user agreement and the RWQMP. It is expected this process would include identification of triggers for interruption, considering the risk basis of the non-compliance. b) By 31st March 2018, review compliance inspections for all sites to identify high risk non-compliances and commence implementation of the interruption to supply process where appropriate. c) By 30th June 2018, review all recycled water customers to confirm there are no high risk non-compliances with their end user agreement and the RWQMP and implement the interruption to supply process where appropriate. d) By 30th June 2019, review all recycled water customers to confirm they are meeting their obligations under their end user agreement and the RWQMP and implement the interruption to supply process where appropriate.
	2.3. Fluoridation code	**Recommendation 2.3-1:** By 30th June 2018, ensure all fluoridation systems are designed, installed, and operated in accordance with the *NSW Code of practice for fluoridation of public water supplies 2011* (unless an exemption has been received from NSW Health), with particular reference to: • ensuring the dosing capacity of the fluoride dosing equipment does not exceed 110% of the target dose rate • ensuring water traps remain filled • providing appropriate colour coding and marking of dosing pipes • replacing dust mask filters every 13 weeks • maintaining a minimum of 3 months storage of fluoridating agent or apply for an exemption from this minimum standard 8.2.1.1 from NSW Health. • ensuring emergency response plans are consistent with *Appendix C* of the *NSW Code of practice for fluoridation of public water supplies 2011* • submitting written notifications to cover all periods of repair/maintenance • ensure internal audits assess compliance with all relevant requirements of Chapter 5 of the *NSW Code of practice for fluoridation of public water supplies 2011*

Section	Clause	Recommendations
8. Performance monitoring	8.4 Performance indicators and system performance standards	**Recommendation 8.4-1:** By 31st March 2018, Sydney Water should review its reporting process for infrastructure indicator I5 to provide assurance over future reported data. **Recommendation 8.4-2:** By 31st March 2018, Sydney Water should evaluate the data it has historically reported for indicator I5 and report corrected data if necessary **Recommendation 8.4-3:** By 31st December 2018, Sydney Water should put in place appropriate measures (e.g. training and awareness and controls on work order close out) to ensure that overflow ceased times are recorded accurately in future. **Recommendation 8.4-4:** By 30th June 2018 Sydney Water should assess whether its current processes for capturing site evidence for sewage overflow events (e.g. before and after photographs) and adherence to these processes is sufficient for its business processes. **Recommendation 8.4-5:** By 30th June 2018, for the 2017/18 audit year Sydney Water should demonstrate that it has in place an appropriate audit trail for events where the priority has been changed. Appropriate evidence may include a schedule detailing the change made, the date of the change, who made the change, justification for the change.

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Tables

Glossary

Item	Detail
Act	Generally refers to *Sydney Water Act 1994* (NSW).
ADWG	NHMRC, NRMMC (2011) Australian Drinking Water Guidelines Paper 6 National Water Quality Management Strategy. National Health and Medical Research Council, National Resource Management Ministerial Council, Commonwealth of Australia, Canberra. Version 2.0 Updated December 2013. ISBN Online: 1864965118).
AGWR	AGWR (2006) Australian Guidelines For Water Recycling: Managing Health and Environmental Risks (Phase1). Natural Resource Management Ministerial Council Environment Protection And Heritage Council Australian Health Ministers Conference. Web Copy: ISBN 1 921173 06 8
Aquality	WSAA's *Framework for Management of Drinking Water Quality* benchmarking tool.
AS	Australian Standard
AS/NZ ISO 9000	Quality management systems – Requirements (2016)
AS/NZ ISO 9001	Quality Management Systems - Requirements (the Quality Management System) (2008)
AS/NZ ISO 9011	Guidelines for auditing management systems (2014)
AS/NZS 4020	Australian and New Zealand Standards for testing of products for use in contact with drinking water
ASAE	Australian Standard on Assurance Engagements
ASAE 3100	Compliance Engagements issued by the Auditing and Assurance Standards Board (2017)
ASAM	A database for management of reservoir information
Audit Guideline	IPART (2016) "*Public Water Utility Audit Guideline"* (May 2016)
Audit Period	The dates of 1 July 2016 to 30 June 2017 over which Sydney Water's compliance is checked against certain clauses of its Operating Licence (as determined by IPART)
AWTP	Advanced Water Treatment Plant
BCR	Business Customer Representative
BI	Business Intelligence
BillAssist	Sydney Water's customer assistance program for people experiencing longer-term payment difficulties.
BMIS	Business Management Information System
BOO	Build Own Operate
BOOT	Build Own Operate Transfer
C2C	Catchment to Consumer
CCP	Critical control point (as defined in the Framework)
CDP	contribution development plans
CE/CEO	Chief Executive or Chief Executive Officer
CMS	Customer Management System
Compass	A software platform for training records
CoP	Fluoride Code of Practice
CPI	Consumer Price Index
DCS	Distributed control system
DMF	Dual Media Filter
DPI	NSW Department of Primary Industries
DPI Water	DPI Water is responsible for the management of the state's surface water and groundwater resources
DSP	Developer Servicing Plans
DW	Drinking Water
DWM Manual	Drinking Water Management Manual
E. coli	*Escherichia coli*
EKAMS	Effluent Knowledge and Management System
ELWC	Economic level of water conservation
EPA	NSW Environment Protection Authority

Item	Detail
Fluoride Code	New South Wales Code of Practice for Fluoridation of Public Water Supplies 2011 (Fluoride Code) (*Fluoridation of Public Water Supplies Act 1957* (NSW)) New South Wales Government Gazette No. 35
Framework	This term refers to either the *Framework for Management of Drinking Water Quality* or the *Framework for Management of Recycled Water Quality and Use*. Its meaning *in situ* depends on the context of the clause being assessed
GSC	Greater Sydney Commission
HIDRA	Hazard Identification and Risk Assessment
IEC	International Electrotechnical Organisation
IICATS	Integrated Instrumentation Control Automation and Telemetry System
IMS	Information management system
IPART	Independent Pricing and Regulatory Tribunal of NSW
ISO	International Standards Organisation
ISO 14000	A family of international standards relating to environmental management.
ISO 31000	ISO 31000:2009 Risk Management – Principles and Guidelines. (adopted in Australia as AS/NZS ISO 31000:2009 (ISO 31000)
ISO 55001	ISO 55001:2014 Preview Asset management -- Management systems -- Requirements
IT	Information Technology
IWCM	Integrated water cycle management
JOG	Joint Operational Group
KPI	Key Performance Indicator
Licence	2015-2020 Operating Licence
Licence	Sydney Water Corporation Operating Licence 2015-2020
LIMNOS	A database for management of water quality laboratory results. The system automatically reviews water quality results on a daily basis. LIMNOS is used by Sydney Water as an operational tool for water quality exception reporting.
LRV	Log Reduction Value
LTV	Long term Trigger Value
Maximo	An enterprise asset management system
MOS	Management Operating System
MD	Managing Director
ML	Megalitre (1 million litres)
MoU	Memorandum of Understanding
MPMS	Monitoring Process Monitoring System
MWD	Metropolitan Water Directorate
NGO	Non-government Organisation
NOM	Natural Organic Matter
NPR	National Performance Report
NSW Health	NSW Department of Health
NWI	National Water Initiative
OEMP	Operational Environment Management Plant
OOLR	Operator of last resort (under the WIC Act)
PAS	Payment Assistance Scheme
pH	A measure of the acidity of a solution related to the concentration of hydrogen ions.
PLC	Programmable Logic Controller
PlumbAssist	PlumbAssist as a regulated social program for our customers in hardship.
PMIF	Project Management Improvement Framework
POEO	Protection of the Environment Operations (Act)
PPE	Personal Protective Equipment
QA	Quality Assurance
QMS	Quality Management System
Reporting Manual	Reporting Manual for Sydney Water Corporation Water — Reporting Manual June 2013 (IPART)
RPZ	Reduced pressure zone device
ROLR	Retailer of last resort (under the WIC Act)

Item	Detail
RW	Recycled Water
RWM Manual	Recycled Water Management Manual
RWMS	Recycled Water Management System
RWQMP	Recycled Water Quality Management Plan
SAP	Systems, Applications and Products in Data Processing
SCA	Sydney Catchment Authority
SCADA	Supervisory Control and Data Acquisition
SDIMS	Service Delivery Integrated Management System
SDP	Sydney Desalination Plant Pty Ltd
SIP	Standard Incident Procedure
SLG	Strategic Liaison Group
SOP	Standard Operating Procedure
SPS	Sewage Pumping Station
SWC	Sydney Water Corporation
SWIRL	Sydney Water Incident Recording and Learning System
Sydney Water	Sydney Water Corporation
UPG	Unit Process Guidelines
UV	Ultraviolet
UVT	Ultraviolet transmissivity
WAMC	Water Administration Ministerial Corporation
WFP	Water Filtration Plant
WIC	Water Industry Competition (Act)
WPS	Water Pumping Station
WQ	Water Quality
WQEMP	Water Quality Environment Management Plan
WRP	Water Recycling Plant
WSAA	Water Services Association of Australia
SQL	Structured Query Language
USA	Utility Services Agreement

1 Introduction

1.1 Objectives

The objective of this audit was to conduct an audit of Sydney Water Corporation's (Sydney Water or SWC) operations, consistent with audit requirements set out in IPART's *Audit Guideline Public Water Utilities* (May 2016), against:

- The Sydney Water *Operating Licence 2015-2020* and
- The *Sydney Water Act 1994* (NSW)

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

1.2 Audit method

1.2.1 Audit scope

The scope of the audit was:

- the operational licence clauses listed in Table 1-1. These clauses have been selected by IPART on a risk basis.
- Recommendation 2015-16-1: 1.9.1 Licence and Licence Authorisation - Pricing
- Recommendation 2015-16-2: 2.2.2 Water Quality - Recycled Water
- Recommendation 2015-16-3: 5.2.4 Customers and Consumers - Providing Information

This audit covers the 2016/17 financial year.

Table 1-1. Licence sections within the 2016/17 audit scope

Section	Clause	Sub clauses
1. Licence and licence authorisation	1.9. Pricing	1.9.1
2. Water quality	2.1. Drinking water	2.1.1, 2.1.2, 2.1.5
	2.2. Recycled water	2.2.1, 2.2.2
	2.3. Fluoridation code	2.3.1
3. Water quantity	3.1 Roles and responsibilities protocol	3.1.1
	3.2 Economic level of water conservation	3.2.2, 3.2.3, 3.2.5
4. Assets	4.1 Asset Management System	4.1.1 (review progress), 4.1.5
	4.2 System Performance Standards	4.2.1, 4.2.2, 4.2.3
	4.3 Response time for water main breaks	4.3.1
5. Customers and consumers	5.1 Customer contract	5.1.2
	5.2 Providing information	5.2.4
	5.4 Assistance options for payment difficulties and actions for non-payment	5.4.3
	5.8 Code of conduct	
7. Quality Management	7.1 Quality Management System	7.1.1
8. Performance monitoring	8.4 Performance indicators and system performance standards	8.4.1
9. Memorandum of understanding	9.1 NSW Health	9.1.1, 9.1.3
	9.2 Environment Protection Authority	9.2.1
	9.3 Water Administration Ministerial Corporation	9.3.1

1.2.2 Audit standard

In conducting this audit, the auditors are following IPART's *Audit Guideline Public Water Utilities* (May 2016).

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

- AS/NZ ISO 19011:2014 Guidelines for auditing management systems
- ASAE 3100 (2017) Compliance Engagements issued by the Auditing and Assurance Standards Board
- AS/NZS ISO 9001:2016: Quality management systems – Requirements
- New South Wales Code of Practice for Fluoridation of Public Water Supplies (2011)
- ISO 55001:2014 Asset Management System - Requirements

1.2.3 Audit team

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

Table 1-2. Audit team members and their qualifications

Team Member	Details
Dr Annalisa Contos **Atom Consulting**	Dr Annalisa Contos holds the following auditor qualifications: 1. Registered Exemplar Global lead auditor (Certificate No. 113465): a. Exemplar Global -DW (Drinking Water) b. Exemplar Global -RW (Recycled Water) c. Exemplar Global TL-AU (Lead Auditor) d. Skill Examiner 2. NSW IPART (Independent Pricing and Regulatory Tribunal) qualified: a. Lead Auditor and Area Specialist Drinking Water Quality b. Lead Auditor and Area Specialist Licence and Regulatory Compliance c. Lead Auditor and Area Specialist Infrastructure Performance d. Lead Auditor and Area Specialist Recycled Water Quality e. Lead Auditor and Area Specialist Sewage Management f. Area Specialist Environmental Management
Dr Annette Davison **Risk Edge™**	Dr Annette Davison holds the following auditor qualifications: 1. Moderating Auditor, registered by the Water Services Association of Australia (WSAA) with skills to use the WSAA "Aquality" benchmarking tool 2. Registered Exemplar Global lead auditor (Certificate No. 12454): a. Exemplar Global-DW (Drinking Water) b. Exemplar Global TL-AU (Lead Auditor) c. Certified ISO 22000 competency from NCSI (Food Safety Management Systems) 3. NSW IPART (Independent Pricing and Regulatory Tribunal) qualified: a. Lead Auditor and Area Specialist Drinking Water Quality b. Lead Auditor and Area Specialist Recycled Water Quality c. Lead Auditor and Area Specialist Sewage Management d. Lead Auditor and Area Specialist Environmental Management e. Lead Auditor Licence and Regulatory Compliance f. Auditor Retail Supply

Team Member	Details
Stephen Walker **Cardno**	Mr Stephen Walker holds the following auditor qualifications: 1. World Partners in Asset Management *Certified Asset Management Assessor No. 59 (www.wpiam.com)*. This accreditation demonstrates compliance with I*SO 17021-5 Competence requirements for auditing and certification of asset management system.* 2. Registered Exemplar Global lead auditor (Certificate No. 638040): a. Exemplar Global TL-AU (Lead Auditor) b. Exemplar Global -DW (Drinking Water) 3. NSW IPART (Independent Pricing and Regulatory Tribunal): a. Lead Auditor and Area Specialist Infrastructure Performance b. Lead Auditor Licence and Regulatory Compliance c. Lead Auditor and Area Specialist Sewage Management d. Lead Auditor and Area Specialist Retail Supply
Adam Wilson **Atom Consulting**	Adam Wilson holds the following auditor qualifications 1. Registered Exemplar Global auditor (Certificate No. 132262): a. Exemplar Global -DW (Drinking Water) b. Exemplar Global -RW (Recycled Water) c. Exemplar Global -AU (Auditor)

1.2.4 Audit grades

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

Table 1-3. Audit grades

Audit finding	Description
Full compliance	Sufficient evidence to confirm that the requirements have been fully met.
High compliance	Sufficient evidence to confirm that the requirements have generally been met apart from **very few minor shortcomings** which do not compromise the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.
Adequate compliance	Sufficient evidence to confirm that the requirements have generally been met apart from **a number of minor shortcomings** which do not compromise the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.
Non-compliant	Sufficient evidence has **not** been provided to confirm that all major requirements are being met and the deficiency adversely impacts the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes.
No requirement	The requirement to comply with the licence condition does not occur within the audit period or there is no requirement for the utility to meet this assessment criterion.

Source: *Audit Guideline Public Water Utilities (IPART May 2016)*

1.3 Regulatory regime

Sydney Water operates largely in a NSW context but must also have regard to matters outside of that jurisdiction, where those matters may affect how it does business. A summary of the key legal and regulatory instruments for Sydney Water is provided in Table 1-4.[2]

Table 1-4. Key legal and formal instruments relevant to Sydney Water's operating licence[3]

Instrument	Relevance
Annual Reports (Statutory Bodies) Act 1984 (NSW)	Applies to reporting requirements of Sydney Water
Bulk Water Supply Agreement	Agreement in place with Water NSW. Raw water is a significant input into Sydney Water's system.
Operating Protocol between Sydney Desalination Plant and Sydney Water	Protocol in place between Sydney Desalination Plant Pty Ltd and Sydney Water. Desalinated water from the desalination plant at Kurnell forms an input to the Sydney Water network when it is operating. This protocol sets out the criteria for operation.
Competition and Consumer Act 2010 (Cth)	An Act for the promotion of competition and fair trading and provision for consumer protection. Could apply to the 'fitness for purpose' of any product or service supplied including drinking water and recycled water.
Current versions of the Australian Drinking Water Guidelines and the Australian Guidelines for Water Recycling	These guidelines are called up under Sydney Water's Operating Licence obligations.
Fluoridation of Public Water Supplies Act 1957 (NSW)	Together with the current Fluoride Code, this Act sets out obligations for utilities fluoridating public water supplies. Sydney Water has a requirement to comply with the Code in its Operating Licence.
Government Information (Public Access) Act 2009 (NSW)	Information may be requested from Sydney Water, which relates to aspects of the licence.
Independent Pricing and Regulatory Tribunal Act 1992 (NSW)	Allows for the regulation of utilities such as Sydney Water including the administration and auditing of licences and pricing functions.
Memorandum of Understanding with NSW EPA 2015	Sets out the working relationship between NSW EPA and Sydney Water.
Memorandum of Understanding with NSW Health 2016	Sets out the working relationship between NSW Health and Sydney Water.
Protection of the Environment Operations Act 1997 (NSW)	This Act sets out the environmental operating context for Sydney Water including, where relevant, the need to gain and operate under an Environmental Protection Licence for its facilities.

[2] Intended to be illustrative, not exhaustive, for the purposes of this report.

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

Instrument	Relevance
Public Health Act 2010 (NSW)	The objectives of this Act are to protect and promote public health, control risks to public health, promote the control and prevent the spread of infectious diseases and recognise the role of local governments in protecting public health. Supporting Regulations are intended to support the smooth operation of the Act. Sydney Water has obligations under this Act including notifying the Minister of any situation that is likely to be a risk to public health.
Sydney Water Act 1994 (NSW)	An Act which establishes Sydney Water as a corporation, among other things.
Sydney Water Operating Licence 2015-2020	A licence issued by IPART NSW, which enables Sydney Water to provide relevant services within its area of operations. This licence also gives effect to the operational audits (this audit) to which Sydney Water is subject.

1.4 Quality assurance process

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

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

2 Clause 1 Licence and Licence Authorisation

2.1 Summary of findings

2.1.1 Clause 1.9 Pricing

Clause 1.9.1 – Non-compliant

Sydney Water self-reported four non-compliances associated with this clause:

- An undercharging of the substance charges for commercial trade waste customers due to customers being charged to two decimal places instead of three
- An overcharging of customers who requested asset construction details by 60 cents per plan
- Collecting developer service contributions without a registered Development Servicing Plan in place and without seeking NSW Treasurers approval to charge a price less than the maximum price under the relevant methodology for the Hoxton Park recycled water scheme
- Collecting developer service contributions without a registered Development Servicing Plan in place and without seeking NSW Treasurers approval to charge a price less than the maximum price under the relevant methodology for Oran Park/Turner Road recycled water scheme.

The Development Servicing Plans (DSPs) for Hoxton Park and Oran Park/Turner Rd were registered by IPART on 18th August 2016 and 28th June 2017 respectively.

2.2 Recommendations

Recommendation 1.9-1: By 31st March 2018 Sydney Water should ensure that substance charges for commercial customers are charged according to the determination[4] to three decimal places.

Recommendation 1.9-2: By 30th June 2018 Sydney Water should develop and implement an auditable quality assurance process to confirm the accuracy of data entry of set fees.

2.3 Opportunities for improvement

There are no opportunities for improvement for this clause.

[4] Determination No. 5, 2016 Maximum prices for Sydney Water Corporation's water, sewerage, stormwater drainage and other services (IPART 2016)

3 Clause 2 Water Quality

3.1 Summary of findings

3.1.1 Clause 2.1 Drinking water

Clause 2.1.1 – High compliance

Clause 2.1.2 – Adequate compliance

Clause 2.1.5 – Full compliance

As well as interviewing personnel at Sydney Water head office, auditors also visited Nepean and Prospect Water Filtration Plants, Campbelltown reservoir complex and mains renewal at Guildford. We would like to note that for both plants visited, the sites were extremely tidy, personnel courteous, knowledgeable and well-prepared and records exemplary.

As appropriate for this clause, the auditors used the Framework for Management of Drinking Water Quality in the Australian Drinking Water Guidelines to test adequacy and implementation of systems and processes.

Clause 2.1.1

Clause 2.1.1 of the operational licence requires Sydney Water to maintain a Management System that is consistent with the Australian Drinking Water Guidelines except where NSW Health specifies otherwise. NSW Health had no other requirements.

We would like to note the good work that Sydney Water (and the contractor for Prospect[5]) are doing, in particular, there are several areas of excellence including Element 8 (community consultation and communication), Element 5 (particularly the customer focus component) and Element 4. Several opportunities for improvement have been made against some of the other Elements. We also note that several inconsistencies in document control and content were noticed however, we accept that for the sheer quantum of evidence reviewed, the gaps are within tolerable limits.

We also note and commend Sydney Water's initiative and progression[6] in 'Development of Drinking Water Management Plans' for each water supply system, Stage 1 of which is designed to identify and fill gaps against the Framework requirements for the water filtration plants.

To support the grading for Clause 2.1.1, the compliance grades and key findings for each element are provided in Table 3-1. We have identified a few minor shortcomings against the framework:

- For the Nepean Risk Review, we could not establish the generalised flow diagram for the purpose of element 2 nor evidence of the requirement for, nor undertaking of field verification of this diagram.
- The process of iterative risk review and review on system change was not articulated in the provided documentation.

We do not believe that these shortcomings compromise the ability of Sydney Water to achieve defined objectives or assure controlled processes, products or outcomes including the protection of public health. We have therefore reached the conclusion that the drinking water sub-clause 2.1.1 was overall high compliance for the licence obligations for the audit date scope. Detailed assessment in respect of this clause is presented in Appendix B.

[5] A presentation was provided by Sydney Water at the interviews 18/09/17 2017 (2017 Ipart audit Prospect ADWG implementation.pptx).

[6] DWQMP Coordination Workshop June 2017 Minutes V2.docx; DWQMP progress Meeting_MoM - 5 Sep 2017.doc.

Table 3-1. Element by element summary of findings for clause 2.1.1

Element	Grade	Key findings
1: Commitment to Drinking Water Quality Management	Full	A drinking water policy is in existence, regulatory and compliance requirements are identified and understood, stakeholders are identified and understood.
2: Assessment of the Water Supply System	High	For the Nepean Risk Review, the generalised flow diagram for the purpose of element 2 could not be established. Evidence of the requirement for, nor undertaking of field verification of a generalised flow diagram could not be confirmed. The process of iterative risk review and review on system change was not articulated in the provided documentation.
3: Preventive Measures for Drinking Water Quality Management	Full	Identification and assessment of preventive measures is consistent with the Framework requirements. The overarching Drinking Water Product Specifications document covers critical control points (CCPs) and the operational control points and the basis for assigning them as such.
4: Operational Procedures and Process Control	Full	Operational procedures and process controls in place, across both Sydney Water and the contractor visited, meet the consistency requirements of this element.
5: Verification of Drinking Water Quality	Full	Comprehensive procedures, processes and records are in place for drinking water quality monitoring (including customer complaints, short term evaluation and actions on results) and review of drinking water quality monitoring.
6: Management of Incidents and Emergencies	Full	Procedures are in place and implemented for both communication and incident and emergency response protocols. A potential issue with currency of the EM0010 Sydney Water Incident Response Plan[7] was checked with Sydney Water. It was confirmed that the document should have been recorded as Issue 6 not Issue 5 and that the document was current for the audit date scope. Further, EM0010 has been superseded with the Emergency Management Procedure (D0000507). This change should be reflected in the Drinking Water Management Manual and checked at the next operational licence audit. Document control issues have been captured in Element 10. An issue was noted with the emergency response plan for fluoride, this has been graded in Clause 2.3.
7: Employee Awareness and Training	Full	Training for water quality awareness and competency at both Sydney Water and contractor-operated sites (as viewed) is in place including for customer service officers. Drinking water policy evidence is discussed at Element 1 and emergency training at Element 6.
8: Community Involvement and Awareness	Full	An effective community consultation strategy is in place. Community awareness is in place.
9: Research and Development	Full	Investigative studies and research monitoring approaches are in place. Design specifications for civil and mechanical works were provided and are consistent with the Framework requirements.

[7] The purpose of this plan is to help assist in the effective management of all levels of incidents including emergencies.

Element	Grade	Key findings
10: Documentation and Reporting	Full	Two key procedures[8] satisfy the document control component and an organisation-wide QMS is being developed (see clause 7 for more information). Documentation is controlled through BMIS with scheduled frequencies for review. Reporting is managed through the Compliance Reporting Procedure[9] (regulatory reports required by IPART) and the Corporate Compliance Program (see Element 1). The Drinking Water Management Manual includes a good summary of Sydney Water's reporting requirements in Tables 10-1[10] and 10-2.[11]
11: Evaluation and Audit	Full	Good processes are in place to cover long-term evaluation of and reporting on results to both internal and external stakeholders. Appropriate audit procedures and schedules are in place.
12: Review and Continual Improvement	Full	Robust processes are in place to cover the Framework requirements for senior management review. Processes are in place to cover requirements for drinking water quality improvements.

Clause 2.1.2

Clause 2.1.2 of the operational licence requires that Sydney Water ensures 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.

A number of minor shortcomings were identified with how Sydney Water is implementing *Element 2 – Assessment of the drinking water supply system of the Framework.* These are described in Table 3-2.

Table 3-2. Minor shortcomings identified against element 2

Area	Framework requirement	Issue
Team	The team should include management and operations staff from the drinking water supplier as well as representatives from relevant agencies. In most cases, consultation with other agencies will be required for the analysis of catchments, which should include the potential impacts of land uses on water quality and stream and river flows. Health and other regulatory agencies should also be involved.	There was a lack of evidence that a team with the appropriate knowledge and expertise was involved for the specific plants risk assessments reviewed.
Flow diagrams	A generalised flow diagram should be constructed describing the water supply system from catchment to consumer. The diagram should: • outline all steps and processes, whether or not they are under control of the drinking water supplier; • summarise the basic characteristics of each component;	While there is an overarching catchment to tap schematic, there is no catchment to tap diagram for the water supply systems reviewed. There was no evidence of the generalised flow diagram used for the Nepean risk assessment review undertaken in the audit date scope.

[8] SDIMS0008 Document Management Procedure.docx; version 5, March 2017; SDIMS0017 Records Management Procedure.docx, version 4 last updated August 2017 although document history shows that previous update was February 2017 and therefore, still in audit date scope.
[9] SDIMS0015 Compliance Reporting Procedure.docx, version 3 15/02/2017.
[10] p67.
[11] p68.

Area	Framework requirement	Issue
	• make explicit any characteristics that are unique to the system; • be verified by field audits and checked by those with specific knowledge of the system.	
Risk assessment	Once potential hazards and their sources have been identified, the level of risk associated with each hazard or hazardous event should be estimated so that priorities for risk management can be established and documented.	Sydney Water undertakes a 5-yearly catchment to tap risk assessment (with a mid-term review). The link between the catchment to tap risk assessment and the plant risk assessment could not be established. We could not establish how the scenarios from the Summer supply risk scenarios were incorporated into the Nepean Risk Review both from an event and consequence and likelihood update
Risk assessment	Periodically review and update the hazard identification and risk assessment to incorporate any changes.	While the Nepean plant risk review was undertaken in 2017, a number of risk descriptions and key controls had not been updated to the current agencies.
		One risk description considered risks associated with potential changes in water quality management of external agencies. As the agency names had not been updated in the risk register, we could not have confidence that this risk had been reviewed and revised as appropriate.

We do not believe that these shortcomings compromise the ability of Sydney Water to achieve defined objectives or assure controlled processes, products or outcomes including the protection of public health. We have therefore reached the conclusion that the drinking water sub-clause 2.1.2 was overall adequate compliance for the licence obligations for the audit date scope. To support the grading for clause 2.1.2, the compliance grades and key issues for each element are provided in Table 3-3.

Table 3-3. Element by element summary of findings for clause 2.1.2

Element	Grade	Key Findings
1: Commitment to Drinking Water Quality Management	Full	Awareness of the importance of the policy was evident from interviews and by other mechanisms such as embedding of responsibilities in position descriptions and in performance indicators at the contracted plants. The policy was sighted at the Nepean and Prospect site visits. Regulatory and formal requirements were understood and embedded through training and inclusion in position descriptions. Stakeholders were identified and evidence provided to support mechanisms of communication and liaison.
2: Assessment of the Water Supply System	Adequate	A number of minor shortcomings were identified as discussed above (Table 3-2).

Element	Grade	Key Findings
3: Preventive Measures for Drinking Water Quality Management	Full	Preventive measures are itemised and assessed in the risk assessments. The site visits confirmed implementation of preventive measures and CCPs in practice.
4: Operational Procedures and Process Control	Full	Operational procedures and process controls in place, across both Sydney Water and the contractor visited, are implemented in practice.
5: Verification of Drinking Water Quality	Full	Evidence for implementation of processes was sighted through the site visits. However, we note that there are some areas for improvement in terms of careful document review and we have included an opportunity for improvement within Element 10.
6: Management of Incidents and Emergencies	Full	Procedures are implemented for both communication and incident and emergency response protocols. Evidence of scenario training was confirmed.
7: Employee Awareness and Training	Full	Records were sighted to confirm training occurs in practice, including for customer service officers. Drinking water policy evidence is discussed at Element 1 and emergency training was undertaken (discussed under Element 6). Evidence showed that Sydney Water undertakes audits of training and an opportunity for improvement was noted during Sydney Water's Nepean audit[12] which looked at training and noted that competency needs[13] to be addressed. There appears to be a high focus on safety and emergency/incident procedures perhaps overshadowing the importance of water quality awareness overall. Linkages from the contribution and development plan at the higher level could be strengthened from a product quality perspective.[14]
8: Community Involvement and Awareness	Full	Evidence was sighted to support customer and community engagement implementation in practice. As an organisation which prides itself on customer experience, the evidence presented for this element supports Sydney Water's approach and shows that the philosophy is well-embedded.
9: Research and Development	Full	Evidence was sighted to show implementation of investigative monitoring and risk scenario analysis. Links to the risk assessment are sometimes difficult to track in practice and this has been picked up in Element 2 and commented on further in Element 12.

[12] Audit A0000059-Nepean Audit Report.xlsx.

[13] "*…training needs for team members must be established to demonstrate that the team members are deemed competent in operating the plant*."

[14] "*To help ensure that further oversights in the management of backflow prevention for recycled water customers do not occur, we will be carrying out refresher training with the Business Customer Representatives responsible for managing recycled water customers. This will cover general roles and responsibilities as well as placing an emphasis on the effective management of backflow prevention devices*."

Element	Grade	Key Findings
10: Documentation and Reporting	Full	For the most part, documents provided as evidence met currency requirements with some exceptions.[15] Evidence was provided to support implementation of reporting at many levels including to a range of regulators (including NSW Health and IPART) and other stakeholders. Evidence of reporting was also reviewed as part of clause 2.1.5.
11: Evaluation and Audit	Full	Implementation of evaluation processes was checked through the sighting of audit and other water quality data analysis reports for aspects pertinent to the drinking water management system. The audit procedures and schedules are implemented in practice.
12: Review and Continual Improvement	Full	Review and continual improvement processes are implemented in practice however, the auditors noted an opportunity for improvement in terms of consolidating several 'improvement registers' to improve consistency and integration (a goal noted by Sydney Water).

Clause 2.1.5

Clause 2.1.5 of the operational licence required Sydney Water, by 31 December 2016, in consultation with its Customer Council and NSW Health, to complete a review of its public reporting on water quality. The review was required to address (at a minimum) the frequency of Sydney Water's public reporting and the key parameters reported on water quality (2.1.5(a)); and provide IPART with a report detailing the outcomes of the review referred to in clause 2.1.5(a) (2.1.5(b)).

Sydney Water consulted with its Customer Council and NSW Health as detailed in Section 4.1 of the Review of Sydney Water's Public Reporting on Drinking Water Quality.[16] A variety of representatives of the Customer Council[17] were represented in the consultation. While the Review of Sydney Water's Public Reporting on Drinking Water Quality document was undated, the auditor was able to confirm transmittal to and receipt by IPART by 23 December 2016. [18] SWC noted that only the minimum requirements of the Clause 2.1.5 of the Reporting Manual were considered with the addition of:

- The Consumer Confidence Report-related requirements of the Sydney Water Act 1994 which was chosen because it prescribes drinking water quality public reporting requirements which are additional to those in the Reporting Manual
- Sydney Water's Daily drinking water quality report, which was chosen because it represents a substantial initiative for improving the transparency of public drinking water quality reporting

The choice of the additional items appears sound and it is sensible to, where possible, integrate reporting requirements to ensure effectiveness of time spent and message disseminated.

This clause achieves full compliance.

[15] E.g. the Community and Stakeholder Engagement Guidelines.pdf (2014) should have been reviewed 10 April 2016 but were not. The risk document (QMAF0018 Risk Matrix.docx) should have been reviewed 06-12-2015 but as explained at the interviews, it is undergoing an overhaul to provide more granularity to the risk matrix.
[16] Review - SW Reporting on DW Quality.pdf (undated)
[17] iConnect 562209_Customer Council Minutes_070916.pdf, 07/09/16).
[18] TRIMed evidence between IPART and Sydney Water confirming delivery and receipt of the findings relating to clause 2.1.5 (23 December 2016).

3.1.2 Clause 2.2 Recycled water

Clause 2.2.1 – High compliance

Clause 2.2.2 – Adequate compliance

Clause 2.2.1

Sydney Water manages its recycled water through a hierarchy of documents supported by its integrated management system. The Recycled Water Management Manual (the RWM Manual) is a roadmap for their recycled water management system and provides the overall corporate management framework relevant to Sydney Water's operational recycled water schemes. The RWM Manual is structured according to the elements, components, and actions set out in the Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 1) (AGWR) 'Framework for management of recycled water quality and use' (AGWR Framework). This manual is supported by scheme specific recycled water quality management plans and a number of companion instruments including:

- Catchment to customer risk assessment
- Recycled water product specifications
- Recycled water improvement plan
- Supporting policies and procedures.

During the audit, we focussed on documentation for St Marys AWTP and Liverpool WRP and undertook a site visit of Liverpool WRP.

We acknowledge the significant effort Sydney Water has undertaken in the development of the recycled water management system including the roadmap and underlying hierarchy of documents. This approach ensures consistency between the schemes while allowing the approach to be tailored to meet specific requirements of each scheme.

Generally, there was strong alignment between the requirements of this clause and Sydney Water's compliance. Across some aspects of the recycled water management system there were a number of shortcomings that did not result in identified public health or environmental impacts during the audit period. Key findings are documented in Table 3-4.

Table 3-4. Element by element summary of findings for clause 2.2.1.

Element	Grade	Key findings
Element 1: Commitment to responsible use and management of recycled water quality	High	This element has been found to have high compliance for clause 2.2.1 due to the lack of clarity regarding the governance of the Liverpool Golf Club pipeline, gaps in the BCR's position description and their responsibilities associated with the safe use of recycled water. There was no evidence of an escalation process when customers are not meeting the requirements of their end user agreements.
Element 2: Assessment of the Recycled Water System	High	Sydney Water has completed a four-year rolling review of their recycled water risk assessment in line with the requirements of this element. The flow diagram for Liverpool WRP was not verified by field audit.
Element 3: Preventive Measures for Recycled Water Management	High	Sydney Water has established that appropriate preventive measures are in place and identified improvement actions for areas where these are required. Critical control points have been established. On-site preventive measures were incorrectly calculated for Liverpool Golf Course and Warwick Farm racecourse. Two prevalidated UV units (Castle Hill and Wollongong) were noted as operating outside their UVT validation range. Shutdown protocols for UVT exceedances below verified UVT ranges for these plants were not sighted.

Element	Grade	Key findings
Element 4: Operational Procedures and Process Control	Full	Sydney Water has well established operational procedures and process control for the treatment and distribution of recycled water.
Element 5: Verification of Recycled Water Quality and Environmental Performance	Full	Sydney Water has developed extensive verification monitoring programs for recycled water quality including the Annual Recycled Water Quality Compliance and Operational Monitoring Plan and internal and external reporting processes for this monitoring. A gap was noted in relation to the receiving environment monitoring on end user sites (with a lack of OEMP for Warwick Farm Racecourse) has been captured in the grade for element 1 as the gap relates to governance rather than verification.
Element 6: Management of Incidents and Emergencies	Full	Procedures are in place for both communication and incident and emergency response protocols.
Element 7: Operator, Contractor and End User Awareness and Training	High	Sydney Water has an extensive training program in place for recycled water management. Formal training and skills maintenance is managed through the contribution and development plan. A competency program is in place for all plant operators, and for Networks Area Water Quality Scientists. Gaps in the identification of training were noted for BCRs for appropriate undertaking of the compliance inspections. During the audit period Sydney Water had developed Compass based e-learning training packages for the scheme RWQMPs to provide training to operators, contractors and end users (although it was not rolled out during the audit period).
Element 8: Community Involvement and Awareness	Full	Sydney Water demonstrated that it had an effective community consultation strategy. A broad range of materials was available to provide advice on safe recycled water use.
Element 9: Validation, Research and Development	Full	Sydney Water has appropriate processes in place for validation research and development
Element 10: Documentation and reporting	Full	Sydney Water demonstrated an appropriate range of documentation and reporting mechanisms for both internal and external reporting.
Element 11: Evaluation and Audit	Full	Sydney Water has appropriate evaluation and audit processes developed and documented in its RWM Manual and supporting documentation.
Element 12: Review and Continuous Improvement	Full	Sydney Water has robust processes documented for the Framework requirements for senior management review. While recycled water improvement actions were captured in the Recycled Water Scheme Improvement Plan, the relationship between this register and the Product Improvement Framework or Product Improvement Register was not clear.

Clause 2.2.2

This clause requires Sydney Water to fully implement the Recycled Water Quality Management system developed as a requirement of Clause 2.2.1. Sydney Water must undertake all relevant activities in accordance with the system and NSW Health must be satisfied these requirements have been discharged.

Generally, there was satisfactory implementation of the recycled water management system. Procedures, training in procedures and document management associated with procedures at Liverpool WRP was excellent.

However, management of end user compliance with their obligations was poor. Within the organisation there was knowledge of long term (greater than 1 year) non-compliance with customer obligations. These had been identified through the BCR site visits and logged as part of the BCR action register[19] (an excel spreadsheet). The shortcomings included:

- The lack of a testable backflow prevention device on an unused connection at Liverpool Golf Club (which, if connected, would have had the potential to draw recycled water into the drinking water system)
- No OEMP for Warwick Farm
- No evidence that Liverpool Golf Club or Warwick Farm Race Course were meeting their documented reporting, auditing and continual improvement obligations (for example soil monitoring and water quality data provided not aligning with sampling obligations under the OEMP).[20]

These issues cut across a number of elements in the AGWR Framework and are considered in more detail in the element by element discussion. Key finding for this sub clause are in Table 3-5.

Table 3-5. Element by element summary of findings for clause 2.2.2

Element	Grade	Key Findings
Element 1: Commitment to responsible use and management of recycled water quality	Adequate	The element has been found to have adequate compliance for clause 2.2.2 due to a number of issues associated with poor management and enforcement of the end user agreements including environmental verification monitoring. There was an over reliance on the annual Statutory Declaration provided by End Users that Purchaser Controls had been in place.
Element 2: Assessment of the Recycled Water System	High	Sydney Water has completed a four-year rolling review of the recycled water risk assessments. While NSW Health was not invited to the Liverpool Risk Assessment, they had been invited to risk assessments held within the audit period. During the field audit inaccuracies were noted in the flow diagram for Liverpool WRP.
Element 3: Preventive Measures for Recycled Water Management	High	Sydney Water has generally established that appropriate preventive measures are in place and identified improvement actions for areas where these are required. Critical control points have been established. The need for an OEMP for Warwick Farm was identified in 2014 and has not yet been developed.
Element 4: Operational Procedures and Process Control	Full	Sydney Water has well established operational procedures and process control that are implemented in practice. Records and training associated with element 4 were excellent at Liverpool WRP.

[19] Recycled Water customer action tracking scheme.xls
[20] p12, p52, 55WQ0003 - Liverpool Recycled Water Quality Mgmnt Plan (RWQMP).pdf

Element	Grade	Key Findings
Element 5: Verification of Recycled Water Quality and Environmental Performance	Full	Sydney Water has developed and implemented extensive verification monitoring programs for recycled water quality. A gap was noted in relation to the receiving environment monitoring on end user sites however this was considered in the grade for Element 1.
Element 6: Management of Incidents and Emergencies	Full	Procedures are implemented for both communication and incident and emergency response protocols.
Element 7: Operator, Contractor and End User Awareness and Training	Adequate	Sydney Water provided evidence that it had delivered an extensive training program for recycled water management. However, a number of minor shortcomings were noted in training and associated competence in relation to the end users, BCRs and their managers.
Element 8: Community Involvement and Awareness	Full	Sydney Water demonstrated that it had an effective community consultation strategy and evidence to support its implementation. A broad range of materials was available to provide advice on safe recycled water use.
Element 9: Validation, Research and Development	Full	Sydney Water has been undertaking a range of validation activities during the audit date scope including monitoring of pathogen surrogates to verify plant performance and UVT verification of UV units.
Element 10: Documentation and reporting	Adequate	Issues were noted in maintaining records in the appropriate systems associated with the BCR role and as well as insufficient review and reporting of the information provided in support of the Annual Declaration.
Element 11: Evaluation and Audit	Adequate	Sydney Water undertakes a range of evaluation and audit activities in line with the requirement of its RWM Manual and supporting systems. Sydney Water had undertaken an audit of its recycled water system within the audit period and demonstrated that it had closed out most actions associated with the June 2016 internal audit of its recycled water management system. However, a number of minor shortcomings were noted associated with evaluation and audit associated with end users. Compliance Inspections and review of the information that should be provided in support of the Annual Declaration were not being appropriately undertaken, communicated and oversighted to demonstrate adequate management of public health and environment risks by the end users.
Element 12: Review and Continuous Improvement	Full	Sydney Water provided a recycled water review presentation as evidence of the review that had been delivered to senior management. A trail of continuous improvement actions was followed to confirm how Sydney Water tracks the undertaking and completion of actions.

3.1.3 Clause 2.3 Fluoridation code

Clause 2.3.1 – Adequate compliance

Clause 2.3.1 requires Sydney Water to comply with the *NSW Code of practice for fluoridation of public water supplies* (NSW Department of Health 2011). There is sufficient evidence to confirm that the requirements have generally been met apart from a number of minor shortcomings which do not compromise the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes. These shortcomings include:

- Sydney Water's incident response procedures do not refer to, and are inconsistent with, the *NSW Code of practice for fluoridation of public water supplies 2011* and fluoride incident management protocols (Appendix C) (CoP 10.3.1.1)
- Failure to submit exception reports (written notifications) in some circumstances which require notification to NSW Health (CoP 11.1.3.1);
- Internal audits did not assess compliance with latest version of the Fluoridation Act, Regulation, and the whole of the Code of Practice (CoP 14.1.1.1);
- The following deviations from the NSW Code of practice for fluoridation of public water supplies 2011 was observed at Nepean WTP:
    - The maximum physical dosing capacity of the fluoridation chemical feeding equipment was observed to be not limited to 110% of the operating target dose rate (CoP 5.1.3.1)
    - The fluoride day tank was observed to be vented to a dry water trap (CoP 5.1.5.5)
    - Pipe markers were not observed on the temporary fluoride dosing pipework (CoP 5.2.5.1)
    - A minimum of 3 months storage of fluoride was not observed (CoP 8.2.1.1)
- The following deviations from the NSW Code of practice for fluoridation of public water supplies 2011 was observed at Prospect WTP:
    - Dust mask filters were observed that had not been changed within 13 weeks (CoP 6.1.1.1)

No evidence was observed which indicated that any of these shortcomings resulted in a risk to public health.

3.2 Recommendations

Recommendation 2.1-1: By 30th June 2018, develop and/or review and update all conceptual system process flow diagrams against the requirements of Element 2, Component 1, Action 2 (A generalised flow diagram should be constructed describing the water supply system from catchment to consumer[21]). The diagram should outline all steps and processes, whether or not they are under control of the drinking water supplier; summarise the basic characteristics of each component; make explicit any characteristics that are unique to the system; be verified by field audits and checked by those with specific knowledge of the system. Development and implementation of a checklist may facilitate conduct of this recommendation.

Recommendation 2.1-2: By 30th June 2018, update and implement the risk assessment process to ensure adequacy of inputs to, and outputs from, the risk assessment. Inputs should include, but not be limited to, documentation of contextual system information which may impact on risks (e.g. whether a recycled water scheme is within the system area, whether other utilities operate within the system area, whether there is a raw water distribution system within the area, whether there are water carter filling stations etc), a Framework-compliant flow diagram and the need for attendance of external stakeholders (NSW Health). The outputs should contain current agency names and reviewed risks reflect the specific system being assessed.

[21] The diagram should outline all steps and processes, whether or not they are under control of the drinking water supplier; summarise the basic characteristics of each component; make explicit any characteristics that are unique to the system; be verified by field audits and checked by those with specific knowledge of the system.

Recommendation 2.1-3: By 30th June 2018, use the flow diagram currently being developed for the Nepean water filtration plant, to review the risk assessment for that plant. As part of the review, ensure that agency names are corrected to reflect current conditions (e.g. Sydney Catchment Authority vs WaterNSW).

Recommendation 2.2-1: By 30th June 2018, determine the required tasks and associated competencies for Sydney Water staff (both frontline and managers) and contractors who are responsible for confirming the efficacy of on-site public health and environmental preventive measures as documented in the recycled water management system and supporting material.

Recommendation 2.2-2: By 30th June 2018, ensure Sydney Water staff (frontline and managers) and contractors who are responsible for confirming the efficacy of on-site measures are trained and assessed as competent to implement their responsibilities. This includes:

- competencies to confirm customer compliance with the Recycled Water Agreements and RWQMP
- competencies to follow procedures and complete appropriate records.

A process for on-going competency assessment should be established and implemented.

Recommendation 2.2-3: By 30th June 2018, ensure compliance inspections are undertaken with sufficient rigour to provide confidence that end user control requirements (Schedule 3 Purchaser Controls) are being met.

Recommendation 2.2-4: Sydney Water must:

a) By 31st March 2018, develop an interruption to supply process where end users are not meeting their obligations under their end user agreement and the RWQMP. It is expected this process would include identification of triggers for interruption, considering the risk basis of the non-compliance.
b) By 31st March 2018, review compliance inspections for all sites to identify high risk non-compliances and commence implementation of the interruption to supply process where appropriate.
c) By 30th June 2018, review all recycled water customers to confirm there are no high risk non-compliances with their end user agreement and the RWQMP and implement the interruption to supply process where appropriate.
d) By 30th June 2019, review all recycled water customers to confirm they are meeting their obligations under their end user agreement and the RWQMP and implement the interruption to supply process where appropriate.

Recommendation 2.3-1: By 30th June 2018, ensure all Sydney Water fluoridation systems are designed, installed, and operated in accordance with the *NSW Code of practice for fluoridation of public water supplies 2011* (unless an exemption has been received from NSW Health), with particular reference to:

- ensuring the dosing capacity of the fluoride dosing equipment does not exceed 110% of the target dose rate
- ensuring water traps remain filled
- providing appropriate colour coding and marking of dosing pipes
- replacing dust mask filters every 13 weeks
- maintaining a minimum of 3 months storage of fluoridating agent or apply for an exemption from this minimum standard 8.2.1.1 from NSW Health.
- ensuring emergency response plans are consistent with *Appendix C* of the *NSW Code of practice for fluoridation of public water supplies 2011*
- submitting written notifications to cover all periods of repair/maintenance
- ensuring internal audits assess compliance with all relevant requirements of Chapter 5 of the *NSW Code of practice for fluoridation of public water supplies 2011*

3.3 Opportunities for improvement

Clause 2.1.1

OFI 2.1.1-1: The drinking water framework does not specifically require contractors be included however, given the heavy involvement of contractors in Sydney's water supply system, the policy could be updated to ensure that contractors are also included in the awareness requirement of the policy.

OFI 2.1.1-2: Develop a register or other which clearly shows the area/system (e.g. catchment, water filtration plant, water supply system or other grouping), when it was last risk reviewed and the frequency and for the next review.

Clause 2.1.2

OFI 2.1.2-1: The policy is not available on Sydney Water's website[22] as a standalone document. Under the 'Water and the Environment' section of the policy page, 'environmental', 'sewer mining' and 'stormwater fencing' are included but not the drinking water policy. The drinking water policy is obscured by its inclusion in the DWM Manual. Customers could get an impression that such a policy does not exist because it is not visible under the 'Water and Environment' page of the policy section. The policy could be removed from the DWM Manual and added to the website for ease of location and viewing.

OFI 2.1.2-2: We note that there are still multiple references to SCA in the Drinking Water Quality 5 Year Plan.[23] Further, p29 of the same document has no mention of Sydney Desalination Plant's responsibility for reviewing radionuclides in the source water. This document should be reviewed and references to appropriate stakeholders added as required.

OFI 2.1.2-3: Training record forms could be improved through addition of another column which shows the role of each attendee, to better integrate and show their responsibilities within the Drinking Water Quality Management System.

OFI 2.1.2-4: Linkages from the contribution and development plan at the higher level could be strengthened from a product quality perspective to ensure that employees and contractors are clear of their responsibilities at the individual level.

OFI 2.1.2-5: A number of documents were noted as having inaccuracies including incorrect dates, incorrect stakeholders, incorrect information, missing sign-off, missing components (e.g. a key table for risk review information). We accept that for the sheer quantum of evidence reviewed, the gaps appear to be within tolerable limits however, Sydney Water could benefit from increasing its focus on document content as well as currency.

OFI 2.1.2-6: Sydney Water currently has at least three instruments[24] for capturing improvements. It was not always easy to track the improvements in such documents and the instruments could benefit from integration (we have observed integrated systems at other utilities which have had the ability to track both small and large improvement actions regardless of origin). The auditors note that this improvement suggestion is also Sydney Water's goal.

OFI 2.1.2-7: Ensure that the Product Management Improvement Register includes clear information on how the improvement action originated (e.g. the line item of KnowRisk, JOG item or other) and clear dates to show status of project e.g. columns for 'commenced date', 'finished date' etc and outcomes of improvement e.g. a link to a report or other and how the improvements were implemented in the water supply system.

[22] https://www.sydneywater.com.au/SW/about-us/our-publications/policies/index.htm.
[23] 496317 – Drinking Water Quality 5 Yr Plan 2016-2017.doc last column, e.g. p22 (an attachment to 547082-Annual Drinking Water Quality Monitoring Plan 16-17.pdf)
[24] 548309 Product Management Improvement Register.xlsx; ADWG Improvement Plan.pdf; DWQMP Improvement Plan.pdf.

Clause 2.1.5

OFI 2.1.5-1: Include a check to ensure that all required signatures are added to key documents before release.

Clause 2.2.2

OFI 2.2.2-1: Conduct the assessment of recycled water system maturity across business units to obtain a better understanding of maturity throughout the organisation.

Clause 2.3

OFI 2.3-1: Ensure transfers to the fluoride day tank only provide 36 hrs of anticipated fluoride usage in total.

4 Clause 3 Water Quantity

4.1 Summary of findings

4.1.1 Clause 3.1 Roles and responsibilities protocol

Clause 3.1.1 – Full compliance

Clause 3.1.1 requires that Sydney Water must use its best endeavours to develop and agree a Roles and Responsibilities Protocol with the Metropolitan Water Directorate for the development and implementation of the Metropolitan Water Plan, and maintain and comply with the Roles and Responsibilities Protocol.

Both Sydney Water and Metropolitan Water Directorate provided evidence supporting that best endeavours were being used to progress the development of the Roles and Responsibilities Protocol with the Metropolitan Water Directorate for the development and implementation of the Metropolitan Water Plan. Although the Protocol has not yet been signed, evidence through e-mail trails and resourcing was provided that Sydney Water and Metropolitan Water Directorate currently have a positive and co-operative working relationship and are progressing the development and implementation of the Metropolitan Water Plan and associated projects.

4.1.2 Clause 3.2 Economic level of water conservation

Clause 3.2.1 – Full compliance

Clause 3.2.1 requires that Sydney Water must develop a methodology in accordance with the approach and principles referred to in clause 3.1.1.

Sydney Water has developed a methodology for determining Sydney Water's economic level of water conservation titled *Determining Sydney Water's Economic Level of Water Conservation Part A The ELWC methodology*. IPART has indicated its satisfaction that the methodology meets the licence requirements and is consistent with the approach and principles approved by IPART.

4.2 Recommendations

There are no recommendations for this clause.

4.3 Opportunities for improvement

OFI 3.2-1: There is an opportunity for improvement to review information provided to customers through its web-site to ensure the information is current.

5 Clause 4 Assets

5.1 Summary of findings

5.1.1 Clause 4.1 Asset management system

Clause 4.1.1 – Full compliance

Clause 4.1.5 – Full compliance

Clause 4.1.1 requires that Sydney Water implements an asset management system that is consistent with the International Standard ISO 55001:2014 Asset Management System. The audit scope requires Sydney Water to provide a verbal update on its progress.

Clause 4.1.5 requires that until the Asset Management System has been developed in accordance with clause 4.1.1, 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). Further 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

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.

We found that Sydney Water continues to maintain and implement the Asset Management Framework as it is in the process of transition transitions to an asset management system in line with the requirements of ISO55001:2014. We found that Sydney Water is making changes to its current asset management framework to facilitate this change. A sample of asset management plans and decision-making frameworks were reviewed as part of the audit.

5.1.2 Clause 4.2 System performance standards

Clause 4.2.1 – Full compliance

Clause 4.2.2 – Full compliance

Clause 4.2.3 – Full compliance

The system performance standards require Sydney Water to meet the following levels of service:

- Clause 4.2.1 (Water Pressure Standard): Sydney Water must ensure that, in any financial year, no more than 6,000 Properties experience a Water Pressure Failure.
- Clause 4.2.2 (Water Continuity Standard): Sydney Water must ensure that, in any financial year:
    - no more than 40,000 Properties experience an Unplanned Water Interruption that lasts for more than five continuous hours; and
    - 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).
- Clause 4.2.3 (Wastewater Overflow Standard) Sydney Water must ensure that, in any financial year:
    - no more than 14,000 Properties (other than Public Properties) experience an Uncontrolled Wastewater Overflow in dry weather; and
    - no more than 175 Properties (other than Public Properties) experience three or more Uncontrolled Wastewater Overflows in dry weather.

Our audit concluded that Sydney Water is reporting performance standards in accordance with the reporting requirements for all standards and meeting the required level of performance.

5.1.3 Clause 4.3 Response time for water main breaks

Clause 4.3.1 – Full compliance

Clause 4.3.1 requires Sydney Water to demonstrate that it accurately reports on response time for water main breaks and leaks during the audit period 2016/17.

Our audit concluded that Sydney Water is reporting water main breaks in accordance with the reporting requirements.

5.2 Recommendations

We make no recommendations in relation to this sub-clause.

5.3 Opportunities for improvement

OFI 4.2-1: We suggest that Sydney Water reviews its categorisation of event codes and reporting for sewer overflows for all events (i.e. to both public and private land) so that it is satisfied that it is accurately able to report on sewer overflow events. For the avoidance of doubt, this recommendation relates to all overflow events, not just to overflows to private property as reported at this performance standard, because of the public health risk associated with any overflow and because of the commonalities in recording and reporting overflow events.

6 Clause 5 Customer and consumers

6.1 Summary of findings

Clause 5.1.2 – Full compliance

Clause 5.2.4 – Full compliance

Clause 5.4.3 – Full compliance

Clause 5.8 – Full compliance

Clause 5.1.2 of the operational licence requires Sydney Water to make a copy of the Customer Contract available to any person, free of charge on its website for downloading and upon request made to the Contact Centre. Detailed assessment in respect of this clause is presented in Appendix B.

Clause 5.2.4 of the operational licence requires Sydney Water to advertise in a Sydney-based newspaper at least annually the types of account relief available for Customers experiencing financial hardship and the rights of Customers to claim rebates and the conditions. Detailed assessment in respect of this clause is presented in Appendix B.

Clause 5.4.3 of the operational licence requires Sydney Water to provide, free of charge, an explanation of the Assistance Options for Payment Difficulties and Actions for Non-Payment to residential Customers, at least annually with their Bills; to 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 any other person upon request made to the Contact Centre. Detailed assessment in respect of this clause is presented in Appendix B.

Clause 5.8 of the operational licence requires Sydney Water to use its best endeavours to cooperate 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. Detailed assessment in respect of this clause is presented in Appendix B.

6.1.1 Clause 5.1 Customer contract

Sydney Water noted that there were no updates to the Sydney Water website, Customer Contract section during the audit date scope. There were 214 external downloads of the Customer Contract for the 2016-17 audit period. Sydney Water provided a Google Analytics overview for the dates 1st July 2016 to 30th June 2017 to show evidence of downloads.

The second part of this clause could not be tested specifically as there were no requests for copies of the Customer Contract entered into the Customer Management System (CMS) during the 2016-17 audit period. Records of refresher training for complaints and contacts including the customer contract were therefore requested for December 2016, to establish that customer call centre staff understand the issue and that the fact that no requests for copies of the Customer Contract, was indeed real. Records of training and its content were provided and found to be adequate.[25]

6.1.2 Clause 5.2 Providing information

Sydney Water met the requirement to advertise in a Sydney-based newspaper through advertising in the Sydney Morning Herald. Sydney Water also advertised in two other newspapers, these being the Daily Telegraph and the Illawarra Mercury, to ensure coverage of its area of operations.

Sydney Water's advertisement in all three newspapers covered the requirements of this sub-clause, these being advertising account relief options and rights of customers to claim rebates (including the conditions). This sub-clause therefore achieves full compliance.

[25] 5.1.2 Customer Contact Centre Training Agenda - May 2017.pdf; 5.1.2 Complaint training attendee registers - December 2016; and 5.1.2 Complaint Handling Training Content - December 2016.

6.1.3 Clause 5.4 Assistance options for payment difficulties and actions for non-payment

Sydney Water has a Payment Assistance Policy in place which was in audit date scope and fulfils the requirement for the explanation of assistance options available for customers experiencing hardship. There is no specific section in the policy which clearly states what the actions for non-payment will be. While not non-compliant, this aspect could be improved by including a link to the 'Overdue payments and disconnections for non-payment policy' at Guiding Principle 3.

The water bill contains instructions to customers if they have difficulty paying their bill. As the bill is sent out quarterly, Sydney Water has met its requirement to provide information at least annually with bills.

Evidence to show how Sydney Water records customer information and deals with identification of hardship was viewed through the Customer Management System. Records checked confirmed the process. NGOs also refer hardship customers to Sydney Water and Sydney Water has trained and provided these NGOs with a hardship checklist. A Payment Assistance Scheme Procedure is in place and was current for the audit date scope. Sydney Water's Customer Management System (CMS) does not currently include a field for identifying when a customer is first identified as experiencing hardship (although evidence was provided to show how and when customers are identified). It may be useful to consider adding such a field to CMS. Two opportunities for improvement have been recorded for this clause.

6.1.4 Clause 5.8 Code of conduct

Sydney Water is made aware of WIC licenses through two avenues, these being notification by IPART of all WIC Act licence applications and approaches to Sydney Water by the licensee itself. We were provided with evidence (including from IPART) which confirmed that both of these avenues are utilised. Further, Sydney Water provided evidence to show that it keeps a record of WIC Act licensees and interactions with Sydney Water. Sydney Water interprets its Operating Licence requirement of using 'best endeavours' to mean:

- to negotiate in good faith and
- respond to requests to establish a code of conduct in a timely manner.

The auditor agrees that Sydney Water has formed a reasonable interpretation of 'best endeavours'.

Sydney Water notes that it is not required to proactively seek to establish codes of conduct if such a request has not been made from a licensee. The auditor agrees (and confirmed with IPART) that given the wording of the Operating Licence clause, this interpretation is reasonable.

Sydney Water notes that the typical arrangement between Sydney Water and a WIC Act licensee is via its Utility Services Agreement (USA) rather than a code of conduct. IPART confirmed:

> *"…that in the absence of a water industry code of conduct under cl 25 of the* Water Industry Competition (General) Regulation 2008*, where a Utilities Service Agreement (or any other agreement) between a public water utility and WIC Act licensee includes the requirements of the standard WIC Act licence condition B10, IPART considers it to have met the requirements of a code of conduct."*[26]

There is currently only one code of conduct in force (for Bingara Gorge). The commercial agreement in place between the two parties includes operating protocols and regular communication via email and meetings. Information was provided to demonstrate evidence of communication.

6.2 Recommendations

There are no recommendations for this licence clause.

[26] Email from Director, Licensing and Compliance, IPART, to auditor, 3 October 2017.

6.3 Opportunities for improvement

OFI 5.4-1: Sydney Water could consider referencing its 'Overdue payments and disconnections for non-payment policy' in its 'Payment Assistance Policy' at Guiding Principle 3, so that customers can see the suite of actions that Sydney Water may use.

OFI 5.4-2: As CMS does not currently include a field which would easily identify the date a customer was identified as first experiencing financial hardship, this field should be considered for addition to facilitate Sydney Water's demonstration of compliance with clause 5.4.

7 Clause 7 Quality management system

7.1 Summary of findings

Clause 7.1.1 – Full compliance

Clause 7.1 requires that by 30 June 2017, Sydney Water must develop a Management System that is consistent with the Australian Standard AS/NZS ISO 9001:2008: Quality Management Systems - Requirements (the Quality Management System).

Sydney Water has developed a quality management system consistent with ISO 9001:2015. It currently holds certification to ISO9001:2015 for its IMS for Delivery of Products and Services to Customers. Sydney Water has identified in scope business processes that will be included in its QMS. Sydney Water has developed a portal for its QMS which can be accessed internally by clicking on the QMS 'Cog'. Each component of the QMS Cog links through to processes and procedures relevant to the clauses of ISO:9001:2015 and Sydney Water's business processes. This QMS 'Cog' forms the quality model for the business. Sydney Water has conducted a gap assessment of the standard and documented how they meet the requirements of the standard. The auditors sampled this evidence and are satisfied that the requirements of the sub-clause have been met.

7.2 Recommendations

There are no recommendations for this licence clause.

7.3 Opportunities for improvement

OFI 7.1-1: Sydney Water could consider using specialist technical auditors for relevant components of Sydney Water's business e.g. Exemplar Global Water Quality Management Systems auditors for audits focussing on AGWR and ADWG adequacy and implementation.

8 Clause 8 Performance monitoring

8.1 Summary of findings

Clause 8.4.1 – High compliance

Clause 8.4.1 requires Sydney Water to maintain record systems that are sufficient (to IPART's satisfaction) to enable it to measure accurately its performance against the performance indicators and System Performance Standards specified in the Reporting Manual

Our audit found that one indicator (I5) had been incorrectly reported due to a misunderstanding of the reporting definition. While Sydney Water has considerable management processes and procedures in place, these have apparently not prevented indicator I5 being incorrectly reported.

In trailing work order records to Maximo one important work order time field (overflow ceased) was not being routinely recorded and for a small subset of records, a lesser level of information had been collected. While we do not think that any performance data has been incorrectly reported or has an obvious bias, it is considered that the issues identified call into question the sufficiency of Sydney Water's record systems for the purpose of performance reporting. We consider that these constitute minor shortcomings that do not compromise overall compliance with the objective of this clause.

8.2 Recommendations

Recommendation 8.4-1: By 31st March 2018, Sydney Water should review its reporting process for infrastructure indicator I5 to provide assurance over future reported data.

Recommendation 8.4-2: By 31st March 2018, Sydney Water should evaluate the data it has historically reported for indicator I5 and report corrected data if necessary

Recommendation 8.4-3: By 31st December, Sydney Water should put in place appropriate measures (e.g. training and awareness and controls on work order close out) to ensure that overflow ceased times are recorded accurately in future.

Recommendation 8.4-4: By 30th June 2018, Sydney Water should assess whether its current processes for capturing site evidence for sewage overflow events (e.g. before and after photographs) and adherence to these processes is sufficient for its business processes.

Recommendation 8.4-5: By 30th June 2018, for the 2017/18 audit year Sydney Water should demonstrate that it has in place an appropriate audit trail for events where the priority has been changed. Appropriate evidence may include a schedule detailing the change made, the date of the change, who made the change, justification for the change.

8.3 Opportunities for improvement

OFI 8.4-1: There is a potential improvement opportunity for Sydney Water to better link service request and work order information. We are mindful however that the costs and benefits of any changes need to be carefully weighed up.

9 Clause 9 Memorandum of understanding

9.1 Summary of findings

Clause 9.1.1 – Full compliance

Clause 9.1.3 – Full compliance

Clause 9.1.1

Clause 9.1.1 requires that Sydney Water must maintain the memorandum of understanding with NSW Health entered into under section 35 of the Act.

The MoU sets out structures and processes between Sydney Water and NSW Health. The structures include a Strategic Liaison Group (SLG) and a Joint Operational group (JOG). Agendas and minutes of these meetings were provided as evidence in support of these meetings. The MoU also outlines Sydney Water's role and responsibilities. NSW Health noted they "maintain and effective and open relationship with Sydney Water at officer and strategic levels" and that they were satisfied Sydney Water had met its obligations relevant to water quality under the MoU.

Clause 9.1.3

Clause 9.1.3 requires that 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.

Section 11 of the MoU contains requirements for Sydney Water to immediately report any information or event within its area of operations including the Water Supply System, Recycled Water Supply System or wastewater reticulation, treatment and disposal operations which may adversely affect public health. Sydney Water's drinking and recycled water emergency response plans including notifications have been audited as part of clause 2 and these aspects (Element 6 within the appropriate framework) and were found to be fully compliant.

9.2 Summary of findings

Clause 9.2.1 – Full compliance

Clause 9.2.1

Clause 9.2.1 requires Sydney Water to maintain the memorandum of understanding with the Environment Protection Authority entered into under section 35 of the Act.

The MOU sets out structures including CEO meeting, a Strategic Liaison Group (SLG), a Joint Operational Group (JOG) and processes including joint forums, programs and initiative and exchange of information and data. Sydney Water provided evidence including agenda and meeting minutes that demonstrated the groups has meet are required and covered the issues within the scope of the MoU.

9.3 Summary of findings

Clause 9.3.1 – Full compliance

Clause 9.3.1

Clause 9.3.1 requires Sydney Water to maintain the memorandum of understanding with the Water Administration Ministerial Corporation (WAMC) entered into under section 35 of the Act.

Communication with DPI Water during the audit period was focused on renewing the MoU. Proposed MoU changes were made in November 2015 due to a name change in NSW Office of Water to Department of Primary Industries Water. The document has been with DPI Water until

June 2017. Sydney Water received an updated copy from DPI Water on 22 June, which is now in the process of being approved after legal review.

DPI Water was contacted to comment on the audit. In their response they noted the request to review to MoU was focussed on administrative changes.

9.4 Recommendations

There are no recommendations for this clause.

9.5 Opportunities for improvement

There are no opportunities for improvement for this clause.

10 Previous ministerial recommendations

Recommendation 2015-16-1: 1.9.1 Licence and Licence Authorisation – Pricing

Item	Detail
IPART's recommendation to the Minister	Sydney Water should complete, register and apply the Development Servicing Plan for the Oran Park/Turner Road development (by 30 June 2017).
2015-16 audit findings, and status as reported by utility on 31 March 2017	New recommendation in 2015-16. A draft Development Servicing Plan (DSP) for the Oran Park/Turner Road recycled water scheme has been developed and is on track to be displayed for public consultation for 30 working days. Once the exhibition period is complete, Sydney Water can adopt the DSP and register it with IPART prior to the 30 June 2017 deadline. As part of the DSP process, Sydney Water has requested approval from the NSW Treasurer to cap the developer charges at a price that is lower than the price using the methodology in IPART's Recycled water developer charges, Determination N0. 8, 2006 (The 2006 Determination).
IPART guidance	Auditor to check for completeness
Audit finding	Sydney Water has completed and adopted the Oran Park/Turner Road DSP. The NSW Treasurer's approval was given to cap the developer charges on 5th April 2017. The DSP was registered by IPART on 28th June 2017.
Recommendation status	This recommendation is now closed.

Recommendation 2015-16-2: 2.2.2 Water Quality – Recycled Water

Item	Detail
IPART's recommendation to the Minister	Sydney Water should review recycled water monitoring requirements in consultation with NSW Health to confirm that all validated UV units are operating within their UVT validation envelope, appropriate to the dose monitoring strategy in place (by 30 March 2018).
2015-16 audit findings, and status as reported by utility on 31 March 2017	Significant progress has been made towards recommendation 2014-15-4. The remaining tasks have been captured in a new recommendation 2015-16-2. Regular monitoring of ultraviolet transmittance (UVT) has commenced to collect preliminary information and inform a more in-depth review of ultraviolet radiation (UV) unit operation against validated UVT envelopes. This review will confirm the appropriateness of dose strategies in place and inform any required changes. The review will be undertaken in consultation with NSW Health. The performance of pathogen inactivation in UV units is also being assessed during Log Reduction Value (LRV) verification monitoring. This monitoring is rolled out on a scheme-by-scheme basis as per the LRV verification program.
IPART guidance	Auditor to consider progress to date, however completion date is out of audit scope.
Audit finding	Sydney Water provided UVT performance assessment reports for Rouse Hill, Castle Hill and Wollongong WRP Stage 2. All ten UVT samples for Rouse Hill were above the validated UVT upper limit of 70%. Wollongong UV had one sample of seven that was below the validated UVT range and Castle Hill had two samples of ten that were below the validation limit of 65%. Sydney Water also conducted verification testing of the UV units. NSW Health has advised that to date they have been sufficiently consulted with respect to this recommendation and understand that work is ongoing to meet the deadline of 30th March 2018. Sydney Water has made good progress on this recommendation and the recommendation is on track to meet the March 2018 deadline.
Recommendation status	This recommendation remains open.

Recommendation 2015-16-3: 5.2.4 Customers and Consumers – Providing Information

Item	Detail
IPART's recommendation to the Minister	By 30 June 2017 Sydney Water should develop and implement a procedure or process to ensure that it advertises in a Sydney-based newspaper at least once each year on: 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.
2015-16 audit findings, and status as reported by utility on 31 March 2017	New recommendation in 2015-16. Sydney Water's Customer Services and Corporate and Public Affairs teams have updated their individual business unit work plans to include the advertising of the types of financial assistance options available and the rights of customer to claim rebates. Sydney Water's Folio of Progress for the Customer Contract (which tracks the progress against this Ministerial requirement) has now been amended to include reference to this process. This serves as a reminder when folios are updated at 31 December each year. For the 2016-17 period, the advertisements detailing the types of financial assistance options available and the rights of customer to claim rebates were placed in the Sydney Morning Herald, Daily Telegraph and Illawarra Mercury on Wednesday 15th February 2017, demonstrating compliance with this clause.
IPART guidance	Auditor to check progress
Audit finding	Sydney Water provided several pieces of evidence to support this recommendation.[27] Further, more detailed discussion on this aspect is covered in the Detailed Evidence section (Appendix B, Table B-23). The auditor confirmed that the Folio of Progress for the Customer Contract now contains the requirement for individual business units to update workplans to include advertising on types of financial assistance. The folio is reviewed 6 monthly and this constitutes the process. Line item 123 of the workplan[28] shows where the advertising requirement has been programmed, which provides evidence that the process is being implemented in practice. The auditor confirmed that for the 2016-17 period, advertisements detailing the types of financial assistance options available and the rights of customers to claim rebates, were placed in the Sydney Morning Herald, Daily Telegraph and Illawarra Mercury on Wednesday 15th February 2017.
Recommendation status	This recommendation is now closed.

[27] Advertisement Daily Telegraph.pdf; Advertisement Illawarra Mercury.pdf; Advertisement Sydney Morning Herald.pdf; Corporate Communciations Workplan 2016-17.mpp; Customer Contract_Folio of Progress 2016-17.pdf.
[28] Corporate Communciations Workplan 2016-17.pdf.

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Appendix A Site Visit Report

A.1 Nepean Water Filtration Plant

A site visit was undertaken of the Nepean water filtration plant – the Plant Manager and members of the operations team were interviewed. The audit team viewed the Nepean dam wall and sighted the WaterNSW infrastructure. The working draft flow diagram was used to walk the process from source handover to end of treatment process. The distinction between Sydney Water's and WaterNSW's assets at the source water input was evident with appropriate signage (e.g. raw water sample tap outlets were clearly signed).

The drinking water policy (current version) was sighted on the wall at the office.

At the site office, equipment numbers in the field were checked against records on SCADA to confirm that numbers matched. In particular, ATU3601 (turbidimeter) and WP199 were checked. We note that some of the equipment identifiers will need to be updated (e.g. WP vs WPS for water pump station), also noted by Sydney Water staff. Calibration of various pieces of equipment was checked e.g. for turbidimeters, calibration stickers showed last calibrated 14 October 2016 – this information confirmed the evidence[29] provided pre-site visit. Laboratory equipment was also confirmed as current for calibration.

Work as executed diagrams were provided for the plant.[30] While, for the components checked, the process flow matched the walkthrough, it was not clear from the 'work as exe' diagrams where the water for the chlorine solution was sourced (we verbally confirmed that the water was sourced from potable water reservoir WS252). We note that the working draft flow diagram is currently being finalised but does not yet show where the chlorine make-up water originates (it is important to ensure that all inputs are covered on the flow diagram as they may introduce a source of risk).

Alarm setpoints were checked for CCPs with a focus on disinfection. Chlorine disinfection was found to match[31] the abnormal water quality contingency plan and the process decision making procedure[32] for abnormal water quality as well as the drinking water product specifications.[33] Turbidity limits were also found to match.

Training records for the audit date scope were sighted. A number of these confirmed training in relevant procedures including drinking water quality and emergency management plan awareness, receipt of bulk chemicals and failure of raw water signal. [34] A sample of work orders (preventive maintenance orders or PMOs) was viewed and records matching the PMO were found to be filled in and correct (e.g. daily water monitoring logbook including water monitoring log sheet and daily rounds).[35]

A number of laboratory standards were checked and found to be in date (e.g. conductivity standard and pH 10 and 7 buffers). Laboratory analysers were checked and calibration found to be current.

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[29] Calibration records Nepean WFP.pdf.

[30] All 30 July 2012: Nepean WFP Raw Water Pumping Station WP0077 WFP008 G-015; Nepean WFP Head / Oxidation Tank and Rapid Mix Tank WP008 G-016; Nepean WFP roughing Filters WFP008 G-017; Nepean Gravity Filters WFP008 G-018; Nepean Water Filtration Plant Clear Water Tank and Air Scour Blower Process and Instrumentation Diagram Critical Drawing WFP008 G-019; Nepean Water Filtration Plant Washwater Holding Tank, Thickener and Sludge Drying Beds Critical Drawing WFP008 G-020.

[31] SCADA setoibts HH SP 1.7 mg/L LL SP 0.6 mg/L, WTNE5019.01 Abnormal Water Quality Contingency Plan.pdf (05 29/01/16) < 0.6mg/L or >1.7 mg/L.

[32] WTNE5019 Process Decision Making and Abnormal Water Quality.pdf (version 6, 07/08/2017 – note that while out of audit date scope, the document history (p8) made it clear what had been changed such that all other information would have been current for the audit date scope).

[33] IMS0152.01 Drinking Water Product Specifications.pdf (version 3, 30/06/17).

[34] 05/12/16; 24/01/17 and 31/05/17 respectively.

[35] Records for September 2016 were requested, could be located and were filled in correctly.

A folder containing relevant procedures for the plant was sighted – procedures were found to be current.

An inspection of the Nepean WTP fluoridation system was undertaken. The inspection involved an overview of the water treatment process, a detailed inspection of the fluoridation system and associated monitoring, and interviews with key staff including inspections of records and SCADA.

The flow meters which controlled the fluoride dosing were inspected. Fluoride dosing is flow paced to the treated water flow meter located downstream of the dosing point and interlocked with the inlet flow meter located upstream of the dosing point.

The online fluoride monitoring was inspected, with discussion on the accuracy and reliability of the various online monitors that had been trialled.

The dosing room was inspected, including the dosing skid, day tank and venting. An exhaust fan continuously vented the room. The day tank was vented through a dry water trap.

The dosing pipework was inspected at various locations. Some temporary dosing pipework had been installed to replace pipework damaged during a bushfire, with the permanent pipework to be installed at a later date.

The fluoride storage tank was located under a roof, though the building did not have walls, reducing the need for ventilation. The fluoride storage tank holds 3 months' supply at full capacity.

The on-site water testing room was inspected. The room contained an Orion Dual Star ion selective electrode meter, appropriate standards and buffers which were in date, and appropriate laboratory equipment.

A.2 Prospect Water Filtration Plant

A site visit was undertaken to the Prospect water filtration plant – the Plant Manager and members of the operations team as well as members of Sydney Water's contract team and networks were interviewed. In addition, the SCADA specialist was interviewed in relation to SCADA access and securities.

The audit team walked the flow diagram from input to end of process. The process largely met the flow diagram and description provided as pre-site visit evidence however, the diagram implied that the bypass from the inlet structure to the bypass structure (i.e. bypassing the filters) was a normal part of the process when in fact it is an extremely difficult bypass to effect. The flow diagram would benefit from clear designation of responsibility handover points between source, treatment and distribution.

Various records were sighted in the main operations room (SCADA screens and laboratory). Toolbox meetings are undertaken and good minutes taken as a record of the meetings.[36] The Toolbox records include the attendees, process notes, maintenance notes etc. A sample of Shift Plant Inspection Checklists was requested and records could be easily located and provided.[37]

Recording of laboratory data was checked. Form LAB-100-B is used to record data. Data are checked every 6 hours and logged in Excel. A logic statement is used to flag if data are erroneous (this was demonstrated at the site visit). Data are then saved to a database at which point the records are protected and cannot be changed. Records[38] were requested to verify this process – the hard copy log matched the soft copy spreadsheet.

[36] Hard copy records (on form OHS-P-0263) sighted for 24 and 25 July 2017 – out of audit date scope although shift plant inspection logs were also sighted that were within date scope
[37] 30/04/17; 01/05/17 and 04/03/17 – checklist PC-05-G
[38] Checked several datapoints for 16/11/16

SCADA systems at Prospect are set up to disallow remote access. There is a SCADA permissions procedure in place (not sighted).

A check of currency of laboratory standards was undertaken. All standards checked were in date.[39]

An inspection of Prospect WTP fluoridation system was undertaken. The inspection involved a detailed inspection of the fluoridation system and associated monitoring, and interviews with key staff including inspections of records and SCADA.

The dosing room was inspected, including the fluoride storage area, fluoride batching system, fluoride dosing system, PPE storage and operating showers. The fluoride dosing room had an accumulation of fluoride powder, which is typical of a fluoride powder system.

The flow meters which controlled the fluoride dosing were briefly inspected. Fluoride dosing is flow paced to the sum of the contact channel flow meters located upstream of the dosing point, and interlocked with the Channel 2 meter located further upstream of the dosing point. Discussions were held about the practicality of locating a flow indicator downstream of the dosing point. Suez staff members indicated that it was impractical to locate a reliable flow indicator downstream of the dosing point that was indicative of the flow passing the doing point.

The dosing pipework was inspected at various locations. All of the pipes inspected had pipe markers.

The on-site water testing room was inspected. The room contained a Radiometer Pacific PHM 240 pH/ION ion selective electrode meter, appropriate standards and buffers which were in date, and appropriate laboratory equipment.

A.3 Campbelltown reservoir complex

The site visits included inspection of a newly constructed reservoir roof at the Campbelltown reservoir complex. Sydney Water advised that it has moved away from its typical steel “egg shaped” roof design to an aluminium roof. The aluminium roof includes structural support integral to the roofing panel which represents a considerable cost saving over steel roofs that are required to be supported. Throughout our inspection, Sydney Water identified other areas where it is driving continual improvement in its design with the whole of asset lifecycle in mind. These include the design of chlorine tablet dosing points, inspection hatches and kickboards. The asset delivery staff interviewed displayed a strong understanding of the importance of taking a holistic view of an asset’s life when planning, designing and delivering the asset.

A.4 Liverpool Water Recycling Plant

We visited the Liverpool water recycling plant where we reviewed the asset risk renewal model. Sydney Water advised that asset condition and criticality were assigned for each asset at a cross-functional workshop. This is a reasonable starting point but there is considerable potential for refinement of the approach. In reviewing the spreadsheet tool (to be transferred to a separate information system) we identified that consequence of failure, which is scored against multiple categories aligned with the corporate risk management framework, commonly defaulted to a score of one. We challenged why a score of one was the default to which Sydney Water responded that the software could not take null values. This issue needs to be rectified as it will result in an upward bias in scoring asset criticality; but it is unlikely to have impacted any investment decisions as these are driven by higher scores.

It was advised that the bearings on a secondary clarifier at the Liverpool water reclamation plant had failed during the audit period and that this outcome had been identified as a high risk in the renewals forecasting tool. That the failure occurred before a risk based decision was made to replace, renew or refurbish the asset highlights the need for this tool to be in place. Sydney Water is

[39] Buffers for pH 4 and 7 (10/11/17), potassium iodide (03/11/17) and phenylarsene oxide (October 2017)

fortunate that while the bearing on a final settling tank is critical to the final settling tank, and that this particular final settling tank is critical to effluent quality, the Liverpool water reclamation plant is not critical to delivering service to customers or meeting Sydney Water's licence obligations as the effluent is transferred to the Malabar sewage treatment plant which is only obliged to undertake primary treatment of sewage. We do not make any recommendations or identify any improvement opportunities in this area because Sydney Water has demonstrated that it is meeting its technical and customer levels of service and that it is aware of the areas in which improvements can be made.

A walk through of the plant flow diagram was undertaken. The documented critical limits were cross checked with the SCADA and found to match. The operators were unable to change the critical limits, which is appropriate. The plant shutdown on a simulated CCP exceedance was demonstrated. SOPs provided as pre-interview evidence matched those in use at the plant. A number of laboratory standards were checked and found to be in date (e.g. pH buffers).

A.5 Water main renewal Guildford

We visited a water main renewal at Cross St Guilford. This renewal involved replacement of 365 m of 150 mm cast iron water main. Best practice pipe hygiene practices were observed include foam end caps in the pipes prior to installation and the storage of fittings off the ground. We requested, and were provided with, the business case justifying the works. This individual job was included in a business case with a bundle of ten jobs in total. The cost and benefits of each job were identified separately and the Cross St job had an estimated benefit cost ratio of 1.24 driven by a forecast avoidance of five failures each year.

Appendix B Detailed Findings

Clause 1.9 Pricing

Table B-1. Clause 1.9.1 compliance grade

Subclause	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 the licence, the Act and the maximum prices and methodologies for Services determined from time to time by IPART under the IPART Act.	Non-compliant

Risk	Target for full compliance
Non-compliance with this sub-clause poses a risk that Sydney Water is either overcharging customers or failing to recover the cost of providing a service or product	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 for Services determined by IPART

Evidence sighted

- ACDP0393 - Minor service extension policy (1).pdf
- Pricing_Folio of Progress 2016-17.pdf
- Shared Drive - Hoxton Park cap.pdf
- Shared Drive - Letter to IPART asset construction details.pdf
- Shared Drive - Letter to IPART substance charges.pdf
- Shared Drive - Oran Park_Turner Rd Colebee cap.pdf
- Shared Drive - Price path 2016-17 sign-off.pdf
- Shared Drive - Price path 2016-17.xlsx
- Shared Drive - Reduced Rouse Hill stormwater charge.pdf
- determination_-_sydney_water_corporation_-_maximum_prices_for_water_sewerage_stormwater_drainage_and_other_services_from_1_july_2016.pdf
- final_report_-_pricing_arrangements_for_recycled_water_and_sewer_mining_-_september_2006_-_website_document.pdf
- Sydney Water Corporation Maximum prices for water, sewerage, stormwater drainage and other services from 1 July 2016 (IPART 2016)
- Schedule A Non Compliances 2016-17_consolidated report.pdf

Summary of reason for grade

Sydney Water self-reported four non-compliances associated with this clause:

- an under charging of the substance charges for commercial trade waste customers due to customers being charged to two decimal places instead of three
- customers who requested asset construction details were overcharged by 60 cents per plan
- collecting developer service contributions without a registered Development Servicing Plan in place and without seeking NSW Treasurers approval to charge a price less than the maximum price under the relevant methodology for the Hoxton Park recycled water scheme
- collecting developer service contributions without a registered Development Servicing Plan in place and without seeking NSW Treasurers approval to charge a price less than the maximum price under the relevant methodology for Oran Park/Turner Road recycled water scheme.

Discussion and notes

Substance charges for commercial customers

The 2016 Determination[40] (released June 2016) sets the unit price for Pollutant charges for Industrial Customers[41], Corrosive Substance Charges for Industrial Customers[42] and Substance Charges for Commercial Customers[43] to three decimal places. Prior to 2012, these charges for commercial customers were set to two decimal places only.

Sydney Water has truncated the unit price for substance charges for commercial customers to two decimal places (effectively rounding down the price) since 2012. As a result, Sydney Water levied charges to these customers at a rate that was lower than the maximum price without approval from the NSW Treasurer. This is a non-compliance against section 18 of the *IPART Act 1992*, and, therefore, clause 1.9 of the Operating Licence.

The non-compliance is limited to substance charges for commercial customers only. The unit price was truncated from three decimal places as Sydney Water's billing system was configured with only two decimal places in the relevant data field for commercial charges. Substance charges for industrial customers have always been charged to three decimal places and Sydney Water's billing system includes three decimal places in the relevant data field for industrial charges.

Sydney Water has updated its billing system to accommodate three decimal places for substance charges for commercial customers. Sydney Water has advised that bills issued from 1 November 2017 include the charges to three decimal places.

Asset construction details

Customers who requested asset construction details between 7th July and 1st September 2016 were charged $45.29 rather than the IPART determined price of $44.69 resulting in an overcharge of 60 cents per plan. At the time, this charge was raised through Sydney Water's internal Plans Notification of Costs invoicing system. This system has charges that are entered on an annual basis as well as the flexibility to raise an invoice for a specific charge.

During the annual CPI update of the Plans Notification of Costs invoicing system, the price for providing building over asset details ($45.29) was mistakenly entered as the price for providing asset construction details ($44.69). Prior to 1st July 2016, the price for both services was the same.

Once aware of the error, Sydney Water adjusted its systems to reflect the correct price. Sydney Water also checked all other ancillary charges to confirm that they were in accordance with determined prices. No other errors were found.

From 9th February 2017, the charge has been administered via the Tap In invoicing system. Going forward, annual CPI price updates will be entered as part of the annual schedule of data into the Tap In invoicing system.

Hoxton Park recycled water scheme and Oran Park/Turner Road recycled water scheme DSP

Previously declared non- compliances with Hoxton Park recycled water scheme and Oran Park/Turner Road recycled water scheme DSP continued into the current audit period.[44]

[40] Determination No. 5, 2016 Maximum prices for Sydney Water Corporation's water, sewerage, stormwater drainage and other services (IPART 2016)
[41] Table 13, Sydney Water Corporation Maximum prices for water, sewerage, stormwater drainage and other services from 1 July 2016 (IPART 2016)
[42] Table 14, Sydney Water Corporation Maximum prices for water, sewerage, stormwater drainage and other services from 1 July 2016 (IPART 2016)
[43] Table 18, Sydney Water Corporation Maximum prices for water, sewerage, stormwater drainage and other services from 1 July 2016 (IPART 2016)
[44] Sydney Water Corporation Operational Audit 2015-16 Report to the Minister (IPART 2016)

Sydney Water is obliged to register a Development Servicing Plan (DSP) for any recycled water scheme where they wish to levy a developer charge. Sydney Water did not comply with IPART's Recycled water developer charges, Determination No.8, 2006 (the 2006 Determination) which set a methodology for fixing the maximum prices that a Water Agency may charge for Recycled Water Developer Charges. During the audit time scope Sydney Water collected non-compliant capital contributions for the Oran Park/Turner Road scheme and Hoxton Park recycled water scheme without a registered DSP in place.

Completing, registering and applying the Oran Park/Turner Road Development DSP was a recommendation outstanding from the previous audit (Recommendation number 2015-16-1). The actions required to register and apply a DSP for the Oran Park / Turner Road development and obtain Treasury approval for the lower price have been satisfactorily completed. The Development Servicing Plans (DSP) for Oran Park/Turner Rd was registered by IPART on 28 June 2017. The DSP for Hoxton Park was registered by IPART on the 18 August 2016.

Recommendations

Recommendation 1.9-1: By 31st March 2018 Sydney Water should ensure that substance charges for commercial customers are charged according to the determination[45] to three decimal places.

Recommendation 1.9-2: By 30th June 2018 Sydney Water should develop and implement an auditable quality assurance process to confirm the accuracy of data entry of set fees.

Opportunities for improvement

There are no opportunities for improvement for this sub-clause.

[45] Determination No. 5, 2016 Maximum prices for Sydney Water Corporation's water, sewerage, stormwater drainage and other services (IPART 2016)

Clause 2.1 – Drinking Water - Water Quality

Table B-2. Clause 2.1.1 compliance grade

Subclause	Requirement	Compliance grade
2.1.1	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). [Licence 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). 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.]	High compliance

Risk	Target for full compliance
Waterborne outbreaks from mis-management of drinking water quality still occur in the developed world and therefore, the risk posed to public health from non-compliance with this clause could be significant.	Systems and processes in place to identify the requirements of the Australian Drinking Water Guidelines (assumed to also include the Framework for Management of Drinking Water Quality), in Sydney Water's context, a system, document or other which meets the intent of a Drinking Water Quality Management System and evidence to show how these requirements have been maintained.

Evidence sighted

- Interviews with Water Quality Team.
- Responses to audit questionnaire questions.
- Site visit to Nepean and Prospect Water Filtration Plants, 19 September 2017.
- 1. Agenda JOG 17 August 2016_final.docx
- 2016-17 CDP Goals_Staff
- 2017 Ipart audit Prospect ADWG implementation.pptx
- 2017 Ipart audit Prospect ADWG implementation.pptx
- 294300-Monthly Fluoride Report to NSW Health July 2017.xlsx
- 496317 - Drinking Water Quality 5 Yr Plan 2016-2017.doc
- 547082-Annual Drinking Water Quality Monitoring Plan 16-17.pdf
- 547810-Drinking Water Quality Oprtnl Monitoring Plan 16-17.pdf
- 548309 Product Management Improvement Register.xlsx
- 554785-Community Stakeholder Engagement Policy.pdf
- 583464 - DW Quality Compliance and Performance Report_15-16.pdf
- 613235 - Q4 Drinking Water Quality Report - NSW Health.pdf
- 614392 - Agenda JOG 29 May 2017.pdf
- 614549 - Minutes JOG 29 May 2017.pdf
- 614913 - Zone population sites 2016-2017.xls
- 614989 - Qrtly Drinking Water Quality Report (CCR) Q4 16-17.pdf
- A0000059-Nepean Audit Report.xlsx
- A0000101 Nepean Audit 2016 Report Final.pdf
- ACP0028 Water Supply Code of Australia SW Edition 2014.pdf
- ACP0166 Supplement to WSA 201 Technical Specification.pdf
- ADWG Improvement Plan.pdf

- Agenda - NSW Health Meeting 2016.10.06.docx
- Agenda - Water Forum - Q2 May2017.docx
- Agenda Mgt Review 15-16.docx
- AM-005 Management of Assets.pdf
- Annual management review 2015-16_v5.pptx
- AR0005 Dialysis Chlorine Notification Arrangements.doc
- Attendance Register_ RA Workshop Nepean WFP.pdf
- Attendance Register_DWQEMP Nepean WFP.pdf
- BI - Network Performance Report - June 2017.pdf
- BMIS - Nepean Document List.xlsx
- BMIS - Water Common Document List.xlsx
- BMIS_screenshot.PNG
- BMIS_SDIMS0008_Administration.pdf
- BMIS_SDIMS0008_Audit Trail and Review Process.pdf
- BMIS_SDIMS0008_Document Details.pdf
- BMIS0209 Technical Specification Part 2 Mechanical Works.pdf
- BMIS0213 Drinking Water Management Manual.pdf
- BMIS0213.13 Drinking Water Policy.pdf
- BMIS0214 Product Management Improvement Framework.pdf
- BMIS0249 Sydney Water and WaterNSW Risk Review.docx
- C2T 2014 indiv controls.xlsx
- C2T 2014 indiv controls.xlsx.pdf
- C2T 5 year review workshop 1 Rev 2.pptx
- C2T 5 year review workshop 2.pptx
- C2T 5 year review workshop 6 V3.pptx
- C2T Inspection Route Maprev1.pdf
- C2T Review Procedure V6.docx
- C2T risk register and summary_SCA_05.xlsx
- C2T Workshop 5 Scenario V3.pptx
- Calibration records Nepean WFP.pdf
- Catchment to Customer 2014.pdf
- CatchtoCustomer Risk Register_150316_summary.xlsm
- CMS - Screen shot of customer complaint (CMS 1-GTOF2J).docx
- Community and Stakeholder Engagement Guidelines.pdf
- Compass - Screen shots for {name redacted}.docx
- Compass - WQ training for {name redacted}.docx
- Compass-Incident Investigator Training records.xlsx
- Compass-Incident Investigator Training records.xlsx
- Compass-Incident Investigator Training records.xlsx
- Compass-Records Management Training Register 21 Aug 2017.xlsx
- Compliance Accountability Register.pdf
- CPDMS0023 Technical Specifications Part 1 Civil Works.pdf
- CSIA-Sydney Water - CHF Certification Report - June 2017.pdf
- CTT risk register_networks_05 June 14.xlsm
- D0000506 Sydney Water Incident Management Procedure.pdf
- D0000618 Turbidity Meter Calibration Work Instruction.pdf
- Daily Water Quality Monitoring Log Sheet Nepean WFP.pdf
- DMF Turbidity Analyser Calibration Records Nepean WFP.pdf
- Drinking WQ Event Management plan training (2016) Treatment.pdf
- DW and RW update _JOG 29 May 2017.pdf
- DWQMP Coordination Workshop June 2017 Minutes V2.docx

- DWQMP Coordination Workshop June 2017 Minutes V2.docx
- DWQMP Improvement Plan.pdf
- DWQMP progress Meeting_MoM - 5 Sep 2017.doc
- DWQMP progress Meeting_MoM - 5 Sep 2017.doc
- EM0010 Sydney Water Incident Response Plan.pdf
- Email_NSWHealth_Comments on draft SWC reporting review_201216.msg
- ER-P-IMP-100 Incident Management Plan.pdf
- ER-P-IMP-600 Water Quantity Quality Failure-SOC Notification.pdf
- ER-P-IMP-600-A PWFP Early Warning Report_Chlorine Exceedance.pdf
- Evidence_Drinking Water customer engagement.docx
- Example of calibration sheet for chlorine.jpg
- Example of calibration sheet for conductivity.jpg
- Exercise Facultas 2017 Report and Recommendations.pdf
- Exercise Facultas Concept Document Version 2.pdf
- Extract of Maximo PM schedule Nepean WFP.pdf
- FS067 Field Measurements of DO, pH and Conductivity.pdf
- FS075 Determination of Chlorine Residuals in the Field.pdf
- HOG5214 Online monitoring and control-water assets via IICATS.pdf
- HOG5215 Reporting Equipment Faults.docx
- HR-004 Induction.pdf
- HR-005A PWFP Training Attendance Register DWQEMP.pdf
- HR-P-005 PWFP Training Matrix procedure.pdf
- HR-P-005A PWFP Training Matrix.pdf
- Hydrocarbon synthetic pipe issue Aug 2016 FINAL.docx
- iConnect 562209_Customer Council Minutes_070916.pdf
- Improvement Plan_ Water Futures Gap Analysis Report.pdf
- IMS Audit Plan - 2016 - 2017.xlsx
- IMS Monthly Report 20170706.xlsx
- IMS Monthly Report_June 2017_CD Dashboard Snapshot.pdf
- IMS0152.01 Drinking Water Product Specifications.pdf
- IMS5396.02 Northern Area WQ Training WPIMS5027-5256.pdf
- IMS5396.02 Ops Contracts Training Attendance Register DWQEMP.pdf
- IMS5396.02 Training att. form DWQEMP - Orchard H. Dec 2016.pdf
- INC-13375 Catchment Crypto Risk Assessment.pdf
- INC-13375 Incident debrief with NSW Health.pdf
- INC-13375 Notification email.pdf
- INC-13375 SWIRL Report.pdf
- Incidence and Event_C.pdf
- Incident Sitrep 5 Nepean raw water quality and wastewater system failures.docx
- Investigation - Hydrocarbon Permeation (Grenfell Pl).pdf
- IPART Review of Public Reporting_Final.pdf
- July Customer Delivery Performance report for June 2017 Data.pdf
- June 2017 Potts Hill Del Sys control chart.docx
- Key characteristic trending chart June 2017.docx
- Key documents review-210817.xlsx
- KnowRisk Register Nepean WFP.pdf
- Landscape Appendix Document alignment to ADWG Framework V3 BOO Version +AS.docx
- Landscape Appendix Document alignment to ADWG Framework V3 BOO Version +AS.docx
- LIMNOS SCREEN.docx
- Maintenance Meeting Minutes June 2017 Nepean WFP.pdf
- Maximo - Customer Complaint Monthly Report June 2017.xlsm

- Minutes - CCP validation meeting 12 May 2016.DOCX
- Minutes - CCP validation meeting 12 May 2016.DOCX
- Minutes - Water Forum - Q1 2017_draft.docx
- Minutes - Water Forum - Q2 2017.docx
- Minutes JOG meeting 14 August 2017.docx
- Nepean WFP 5 year plan for asset maintenance and renewal.xlsx
- NOM Roadmap.pptx
- OS0015 Bulk Chemical Data Capture and Assessment Work Instrns.pdf
- PBP0001-Development Planning for Water Quality Scientists.doc
- PBP0001.01 WQS Development Roster Rotation 2017.pdf
- PC-02 Process Monitoring and Chemical Regimes.pdf
- PC-06 Chemical Procurement.pdf
- PC-06A Incoming Chemical Inspection Sheet.pdf
- PC-06B Chemical Specification.pdf
- Permeation of contaminants through plastic pipes.msg
- Position Description - Service Planning Analyst.pdf
- Position Description Manager Service and Asset Strategy.pdf
- Position Description Manager, Product and Asset Management.pdf
- Position Description Plant Manager Level 1 and 2.pdf
- Position Description Production Officer A - D.pdf
- Position Description Service Delivery Officer 6.pdf
- PP-001 Plant and Process Overview.pdf
- PRO-003 Qualify a New Supplier.pdf
- Public reporting review - Tabled at JOG.docx
- PWFP Incident Management Contact List.pdf
- PWFP Interconnection Facilities.pdf
- PWFP Operational Risk Register.pdf
- PWFP SCADA overview.pdf
- PWFP Screenshot of Integrum Operations Procedures.pdf
- PWFP SWC Monthly Performance Report June 17.pdf
- QMAF0003 Risk Management Policy.docx
- QMAF0018 Risk Matrix.docx
- QMAF0081- Corporate Risk Management Procedure-2016.docx
- QMAF0081- Corporate Risk Management Procedure-2016.docx
- Quarterly Customer Sentiment Monitor 16-17.pdf
- Review - SW Reporting on DW Quality.pdf
- Review of water quality public reporting - Dec 2016 - report approvals.pdf
- Review of water quality public reporting - Dec 2016 - report approvals.pdf
- SCADA Overview Page Nepean WFP.pdf
- SDIMS Monthly Performance Report-Last year.xlsx
- SDIMS0006 Customer, Regulator and Stakeholder Management.docx
- SDIMS0008 Document Management Procedure.docx
- SDIMS0010 - Audit and Inspection Procedure.docx
- SDIMS0012 Management Review.docx
- SDIMS0015 Compliance Reporting Procedure.docx
- SDIMS0017 Records Management Procedure.docx
- SDIMS0041 Incident Investigation and Lessons Learned WI.pdf
- SDIMS0054 Raw Water Supply Protocols.pdf
- Staff Member Review 6 Dec 16 Signed.pdf
- Site Diary Nepean WFP.pdf
- Southern Area team - Water Quality Update for Sep 2016.doc

- Southern Team meeting minutes Oct 2016.doc
- Staff IWES Certificate - Feb 2017.pdf
- Standardswatch email-3May17.pdf
- Standardswatch email-3May17.pdf
- Standardswatch email-forward to stakeholders-3May17.pdf
- Standardswatch email-forward to stakeholders-3May17.pdf
- StandardsWatch List 1 - current 18th September 2017.docx
- StandardsWatch List 1 - current 18th September 2017.docx
- Suez - Field equipment List (ITME Register LAB).pdf
- Suez - Lab equipment List (ITME Register LAB).pdf
- Suez - PWFP Laboratory Manual.pdf
- Summer supply risks for Prospect and Nepean_Summary_161103.pdf
- Summer supply risks for Prospect and Nepean_Summary_161103.pdf
- SWEMS0003.01 External Requirements Register.docx
- SWEMS0152 Customer Complaint Procedure.pdf
- SYS-006 BIF (Control of NC and Corrective Actions).pdf
- Staff Member IWES Certificate - Feb 2017.pdf
- The Inside Story S3749 - Sentiment Monitor Q3 2016.pdf
- Training record_ UPG Coagulation Flocculation.pdf
- Training records_ Procedures and Contingency Plans Nepean WFP.pdf
- Transmittal to IPART - Operating Licence report on reporting review.msg
- Treatment PO Competency Program Plan.pdf
- Water Futures Gap Analysis Report.pdf
- Water Quality Risk Assessment and CCPs PWFP version 1.xlsx
- Water Quality Risk Assessment and CCPs PWFP version 1.xlsx
- Water Supply Agreement meeting minutes 28 July 2017.docx
- Water Supply Agreement meeting minutes 28 July 2017.docx
- Water Supply Agreement meeting minutes 28 July 2017.docx
- WaterNSW CCPs for Sydney Water Catchments.pdf
- WFP Capacity Modelling and Process Optimisation - Business CasePink Slip - Signed.pdf
- WOQ5162 Managing Water Quality Customer Complaints.docx
- WPIMS5228 Drinking Water Quality Event Management Plan.pdf
- WPIMS5228.01 DWQ Incident Management Contacts.pdf
- WPIMS5274 Triggers Notification and Actions-Adverse WQ Results.pdf
- WPIMS5274 Triggers, Notification and Actions - Adverse WQ.doc
- WPIMS5274.01 E.coliInvReport 21 Orleans Cres - Toongabbie.docx
- WSA 201 Selection and Application of Protective Coatings.pdf
- WTHQ5024 UPG Coagulation Flocculation.pdf
- WTNE5003 Receiving Bulk Chemicals.pdf
- WTNE5006 Process and Equipment Monitoring.pdf
- WTNE5006.01 Daily Water Quality Monitoring Log Sheet.pdf
- WTNE5006.02 Daily Rounds and Lab Sample Form.xls
- WTNE5012 Chemical Drop Test.pdf
- WTNE5019 Process Decision Making and Abnormal Water Quality.pdf
- WTNE5019.01 Abnormal Water Quality Contingency Plan.pdf
- WTNE5029 Emergency Plan.pdf
- WTNE5031 Bushfire Contingency Plan.pdf
- WTNE5033 Master Equipment Calibration List.pdf

Summary of reason for grade

The summary of reasons for grade is provided in Table B-3.

Table B-3. Element by element summary of findings for clause 2.1.1

Element	Grade	Key findings
1: Commitment to Drinking Water Quality Management	Full	A drinking water policy is in existence, regulatory and compliance requirements are identified and understood, stakeholders are identified and understood.
2: Assessment of the Water Supply System	High	For the Nepean Risk Review, the generalised flow diagram for the purpose of element 2 could not be established. Evidence of the requirement for, nor undertaking of field verification of a generalised flow diagram could not be confirmed. The process of iterative risk review and review on system change was not articulated in the provided documentation.
3: Preventive Measures for Drinking Water Quality Management	Full	Identification and assessment of preventive measures is consistent with the Framework requirements. The overarching Drinking Water Product Specifications document covers critical control points (CCPs) and the operational control points and the basis for assigning them as such.
4: Operational Procedures and Process Control	Full	Operational procedures and process controls in place, across both Sydney Water and the contractor visited, meet the consistency requirements of this element.
5: Verification of Drinking Water Quality	Full	Comprehensive procedures, processes and records are in place for drinking water quality monitoring (including customer complaints, short term evaluation and actions on results) and review of drinking water quality monitoring.
6: Management of Incidents and Emergencies	Full	Procedures are in place and implemented for both communication and incident and emergency response protocols. A potential issue with currency of the EM0010 Sydney Water Incident Response Plan[46] was checked with Sydney Water. It was confirmed that the document should have been recorded as Issue 6 not Issue 5 and that the document was current for the audit date scope. Further, EM0010 has been superseded with the Emergency Management Procedure (D0000507). This change should be reflected in the Drinking Water Management Manual and checked at the next operational licence audit. Document control issues have been captured in Element 10. An issue was noted with the emergency response plan for fluoride, this has been graded in Clause 2.3.
7: Employee Awareness and Training	Full	Training for water quality awareness and competency at both Sydney Water and contractor-operated sites (as viewed) is in place including for customer service officers. Drinking water policy evidence is discussed at Element 1 and emergency training at Element 6.
8: Community Involvement and Awareness	Full	An effective community consultation strategy is in place. Community awareness is in place.

[46] The purpose of this plan is to help assist in the effective management of all levels of incidents including emergencies.

Element	Grade	Key findings
9: Research and Development	Full	Investigative studies and research monitoring approaches are in place. Design specifications for civil and mechanical works were provided and are consistent with the Framework requirements.
10: Documentation and Reporting	Full	Two key procedures[47] satisfy the document control component and an organisation-wide QMS is being developed (see clause 7 for more information). Documentation is controlled through BMIS with scheduled frequencies for review. Reporting is managed through the Compliance Reporting Procedure[48] (regulatory reports required by IPART) and the Corporate Compliance Program (see Element 1). The Drinking Water Management Manual includes a good summary of Sydney Water's reporting requirements in Tables 10-1[49] and 10-2.[50]
11: Evaluation and Audit	Full	Good processes are in place to cover long-term evaluation of and reporting on results to both internal and external stakeholders. Appropriate audit procedures and schedules are in place.
12: Review and Continual Improvement	Full	Robust processes are in place to cover the Framework requirements for senior management review. Processes are in place to cover requirements for drinking water quality improvements.

Discussion and notes

See element by element discussion of the Framework for Management of Drinking Water Quality.

Table B-4. Clause 2.1.2 Compliance grade

Subclause	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.	Adequate
Risk		**Target for full compliance**
Waterborne outbreaks from mis-management of drinking water quality still occur in the developed world and therefore, the risk posed to public health from non-compliance with this clause could be significant.		Systems and processes in place to ensure implementation of the Drinking Water Quality Management System in practice across the overall catchment to consumer supply chain (depending on properly identified responsibilities and accountabilities for system components). Evidence to show that NSW Health is satisfied with the Drinking Water Quality Management System and its implementation.

To support the grading for Clause 2.1.2, the compliance grades and key issues for each element are provided in Table B-5. We have identified a number of minor shortcomings against the framework, but do not believe that these shortcomings compromised the ability of Sydney Water to achieve defined objectives or assure controlled processes, products or outcomes including the protection of

[47] SDIMS0008 Document Management Procedure.docx; version 5, March 2017; SDIMS0017 Records Management Procedure.docx, version 4 last updated August 2017 although document history shows that previous update was February 2017 and therefore, still in audit date scope.
[48] SDIMS0015 Compliance Reporting Procedure.docx, version 3 15/02/2017.
[49] p67.
[50] p68.

public health. We have therefore reached the conclusion that the drinking water sub-clause 2.1.2 was overall adequate compliance for the licence obligations for the audit date scope.

Table B-5. Element by element summary of findings for clause 2.1.2

Element	Grade	Key Findings
1: Commitment to Drinking Water Quality Management	Full	Awareness of the importance of the policy was evident from interviews and by other mechanisms such as embedding of responsibilities in position descriptions and in performance indicators at the contracted plants. The policy was sighted at the Nepean and Prospect site visits. Regulatory and formal requirements were understood and embedded through training and inclusion in position descriptions. Stakeholders were identified and evidence provided to support mechanisms of communication and liaison.
2: Assessment of the Water Supply System	Adequate	A number of minor shortcomings were identified (see Table 3-2).
3: Preventive Measures for Drinking Water Quality Management	Full	Preventive measures are itemised and assessed in the risk assessments. The site visits confirmed implementation of preventive measures and CCPs in practice.
4: Operational Procedures and Process Control	Full	Operational procedures and process controls in place, across both Sydney Water and the contractor visited, are implemented in practice.
5: Verification of Drinking Water Quality	Full	Evidence for implementation of processes was sighted through the site visits. However, we note that there are some areas for improvement in terms of careful document review and we have included an opportunity for improvement within Element 10.
6: Management of Incidents and Emergencies	Full	Procedures are implemented for both communication and incident and emergency response protocols. Evidence of scenario training was confirmed.

Element	Grade	Key Findings
7: Employee Awareness and Training	Full	Records were sighted to confirm training occurs in practice, including for customer service officers. Drinking water policy evidence is discussed at Element 1 and emergency training was undertaken (discussed under Element 6). Evidence showed that Sydney Water undertakes audits of training and an opportunity for improvement was noted during Sydney Water's Nepean audit[51] which looked at training and noted that competency needs[52] to be addressed. There appears to be a high focus on safety and emergency/incident procedures perhaps overshadowing the importance of water quality awareness overall. Linkages from the contribution and development plan at the higher level could be strengthened from a product quality perspective.[53]
8: Community Involvement and Awareness	Full	Evidence was sighted to support customer and community engagement implementation in practice. As an organisation which prides itself on customer experience, the evidence presented for this element supports Sydney Water's approach and shows that the philosophy is well-embedded.
9: Research and Development	Full	Evidence was sighted to show implementation of investigative monitoring and risk scenario analysis. Links to the risk assessment are sometimes difficult to track in practice and this has been picked up in Element 2 and commented on further in Element 12.
10: Documentation and Reporting	Full	For the most part, documents provided as evidence met currency requirements with some exceptions.[54] Evidence was provided to support implementation of reporting at many levels including to a range of regulators (including NSW Health and IPART) and other stakeholders. Evidence of reporting was also reviewed as part of clause 2.1.5.
11: Evaluation and Audit	Full	Implementation of evaluation processes was checked through the sighting of audit and other water quality data analysis reports for aspects pertinent to the drinking water management system. The audit procedures and schedules are implemented in practice.
12: Review and Continual Improvement	Full	Review and continual improvement processes are implemented in practice however, the auditors noted an opportunity for improvement in terms of consolidating several 'improvement registers' to improve consistency and integration (a goal noted by Sydney Water).

[51] Audit A0000059-Nepean Audit Report.xlsx.
[52] "*…training needs for team members must be established to demonstrate that the team members are deemed competent in operating the plant*."
[53] "*To help ensure that further oversights in the management of backflow prevention for recycled water customers do not occur, we will be carrying out refresher training with the Business Customer Representatives responsible for managing recycled water customers. This will cover general roles and responsibilities as well as placing an emphasis on the effective management of backflow prevention devices*."
[54] E.g. the Community and Stakeholder Engagement Guidelines.pdf (2014) should have been reviewed 10 April 2016 but were not. The risk document (QMAF0018 Risk Matrix.docx) should have been reviewed 06-12-2015 but as explained at the interviews, it is undergoing an overhaul to provide more granularity to the risk matrix.

Recommendations

Recommendation 2.1-1:[55] By 30th June 2018, develop and/or review and update all conceptual system process flow diagrams against the requirements of Element 2, Component 1, Action 2 (A generalised flow diagram should be constructed describing the water supply system from catchment to consumer[56]). The diagram should outline all steps and processes, whether or not they are under control of the drinking water supplier; summarise the basic characteristics of each component; make explicit any characteristics that are unique to the system; be verified by field audits and checked by those with specific knowledge of the system. Development and implementation of a checklist may facilitate conduct of this recommendation.

Recommendation 2.1-2:[57] By 30th June 2018, update and implement the risk assessment process to ensure adequacy of inputs to, and outputs from, the risk assessment. Inputs should include, but not be limited to, documentation of contextual system information which may impact on risks (e.g. whether a recycled water scheme is within the system area, whether other utilities operate within the system area, whether there is a raw water distribution system within the area, whether there are water carter filling stations etc), a Framework-compliant flow diagram and the need for attendance of external stakeholders (NSW Health). The outputs should contain current agency names and reviewed risks reflect the specific system being assessed.

Recommendation 2.1-3:[55] By 30th June 2018, use the flow diagram currently being developed for the Nepean water filtration plant, to review the risk assessment for that plant. As part of the review, ensure that agency names are corrected to reflect current conditions (e.g. Sydney Catchment Authority vs WaterNSW).

Opportunities for improvement

Clause 2.1.1:

OFI 2.1.1-1: The drinking water framework does not specifically require contractors be included however, given the heavy involvement of contractors in Sydney's water supply system, the policy could be updated to ensure that contractors are also included in the awareness requirement of the policy.

OFI 2.1.1-2: Develop a register or other which clearly shows the area/system (e.g. catchment, water filtration plant, water supply system or other grouping), when it was last risk reviewed and the frequency and for the next review.

Clause 2.1.2:

OFI 2.1.2-1: The policy is not available on Sydney Water's website[58] as a standalone document. Under the 'Water and the Environment' section of the policy page, 'environmental', 'sewer mining' and 'stormwater fencing' are included but not the drinking water policy. The drinking water policy is obscured by its inclusion in the DWM Manual. Customers could get an impression that such a policy does not exist because it is not visible under the 'Water and Environment' page of the policy section. The policy could be removed from the DWM Manual and added to the website for ease of location and viewing.

OFI 2.1.2-2: We note that there are still multiple references to SCA in the Drinking Water Quality 5 Year Plan.[59] Further, p29 of the same document has no mention of Sydney Desalination Plant's

[55] This recommendation covers clauses 2.1.1 and 2.1.2 as it covers both process/consistency (meeting Framework requirements) and implementation (developing Framework-compliant flow diagrams).
[56] The diagram should outline all steps and processes, whether or not they are under control of the drinking water supplier; summarise the basic characteristics of each component; make explicit any characteristics that are unique to the system; be verified by field audits and checked by those with specific knowledge of the system.
[57] This recommendation relates mainly to 2.1.2 as it covers implementation of the risk assessment process but also relates to the adequacy of that implementation (i.e. consistency with Framework requirements).
[58] https://www.sydneywater.com.au/SW/about-us/our-publications/policies/index.htm.
[59] 547082-Annual Drinking Water Quality Monitoring Plan 16-17.pdf, last column, e.g. p22.

responsibility for reviewing radionuclides in the source water. This document should be reviewed and references to appropriate stakeholders added as required.

OFI 2.1.2-3: Training record forms could be improved through addition of another column which shows the role of each attendee, to better integrate and show their responsibilities within the Drinking Water Quality Management System.

OFI 2.1.2-4: Linkages from the contribution and development plan at the higher level could be strengthened from a product quality perspective to ensure that employees and contractors are clear of their responsibilities at the individual level.

OFI 2.1.2-5: A number of documents were noted as having inaccuracies including incorrect dates, incorrect stakeholders, incorrect information, missing sign-off, missing components (e.g. a key table for risk review information). We accept that for the sheer quantum of evidence reviewed, the gaps appear to be within tolerable limits however, Sydney Water could benefit from increasing its focus on document content as well as currency.

OFI 2.1.2-6: Sydney Water currently has at least three instruments[60] for capturing improvements. It was not always easy to track the improvements in such documents and the instruments could benefit from integration (we have observed integrated systems at other utilities which have had the ability to track both small and large improvement actions regardless of origin). The auditors note that this improvement suggestion is also Sydney Water's goal.

OFI 2.1.2-7: Ensure that the Product Management Improvement Register includes clear information on how the improvement action originated (e.g. the line item of KnowRisk, JOG item or other) and clear dates to show status of project e.g. columns for 'commenced date', 'finished date' etc and outcomes of improvement e.g. a link to a report or other and how the improvements were implemented in the water supply system.

Table B-6. Clause 2.1.5 compliance grade

Subclause	Requirement	Compliance grade
2.1.5	2.1.5 By 31 December 2016, Sydney Water must: 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 provide IPART with a report detailing the outcomes of the review referred to in clause 2.1.5(a).	Full compliance

Risk	Target for full compliance
Not including the public and NSW Health in how Sydney Water conducts its public reporting may mean that essential elements are overlooked or missed in terms of communication.	Evidence to show consultation occurred with the Customer Council and NSW Health. Evidence to show, at a minimum, how the review addressed the frequency of Sydney Water's public reporting and the key parameters reported on water quality. Evidence to show that the review findings were provided to IPART by 31 December 2016.

Evidence sighted

- Interviews with Water Quality Team.
- Site visit to Nepean and Prospect WFPs 19 September 2017.
- Responses to audit questionnaire questions.
- iConnect 562209_Customer Council Minutes_070916
- Agenda JOG 17 August 2016_final

[60] 548309 Product Management Improvement Register.xlsx; ADWG Improvement Plan.pdf; DWQMP Improvement Plan.pdf.

- Agenda - NSW Health Meeting 2016.10.06
- Review – SW Reporting on DW Quality
- Email_NSWHealth_Comments on reporting review_201216
- Public reporting review - Tabled at JOG
- Transmittal to IPART - Operating Licence report on reporting review
- TRIMed evidence between IPART and Sydney Water confirming delivery and receipt of the findings relating to clause 2.1.5 (23 December 2016).
- Review of water quality public reporting - Dec 2016 - report approvals

Summary of reason for grade

Sydney Water consulted with its Customer Council and NSW Health as detailed in Section 4.1 of the Review of Sydney Water's Public Reporting on Drinking Water Quality.[61] A variety of representatives of the Customer Council[62] was represented in the consultation. While the Review of Sydney Water's Public Reporting on Drinking Water Quality document was undated, the auditor was able to confirm transmittal to and receipt by IPART by 23 December 2016. [63] SWC noted that only the minimum requirements of the Clause 2.1.5 of the Reporting Manual were considered with the addition of:

- The Consumer Confidence Report-related requirements of the *Sydney Water Act 1994* which was chosen because it prescribes drinking water quality public reporting requirements which are additional to those in the Reporting Manual
- Sydney Water's Daily drinking water quality report, which was chosen because it represents a substantial initiative for improving the transparency of public drinking water quality reporting

The choice of the additional items appears sound and it is sensible to, where possible, integrate reporting requirements to ensure effectiveness of time spent and message disseminated.

This clause achieves full compliance.

Discussion and notes

Sydney Water consulted with its Customer Council and NSW Health as detailed in Section 4.1 of the Review of Sydney Water's Public Reporting on Drinking Water Quality.[64] Evidence to support this statement was provided. A variety of representatives of the Customer Council[65] was represented including Local Government NSW, Public Interest Advocacy Centre and Council of the Ageing. Discussion on changes to public reporting of water quality was in evidence at Item 5 of the minutes.[66]

While the Review of Sydney Water's Public Reporting on Drinking Water Quality document was undated, the auditor was able to confirm transmittal to and receipt by IPART by 23 December 2016.[67]

SWC noted that only the minimum requirements of the Clause 2.1.5 of the Reporting Manual were considered with the addition of:

- the Consumer Confidence Report-related requirements of the *Sydney Water Act 1994*, which was chosen because it prescribes drinking water quality public reporting requirements which are additional to those in the Reporting Manual
- Sydney Water's *Daily drinking water quality report*, which was chosen because it represents a substantial initiative for improving the transparency of public drinking water quality reporting.

[61] Review - SW Reporting on DW Quality.pdf (undated)
[62] iConnect 562209_Customer Council Minutes_070916.pdf, 07/09/16).
[63] TRIMed evidence between IPART and Sydney Water confirming delivery and receipt of the findings relating to clause 2.1.5 (23 December 2016).
[64] Review - SW Reporting on DW Quality.pdf (undated)
[65] iConnect 562209_Customer Council Minutes_070916.pdf, 07/09/16).
[66] iConnect 562209_Customer Council Minutes_070916.pdf, 07/09/16).
[67] TRIMed evidence between IPART and Sydney Water confirming delivery and receipt of the findings relating to clause 2.1.5 (23 December 2016).

The choice of the additional items appears sound and it is sensible to, where possible, integrate reporting requirements to ensure effectiveness of time spent and message disseminated.

NSW Health was informed of the review with the Customer Council. Two pieces of evidence were provided:

- Agenda - NSW Health Meeting 2016.10.06.docx
- Agenda JOG 17 August 2016_final.docx – (the line item associated with 'Changes to drinking water quality report' was confirmed as the item representing the discussion on this issue with NSW Health).

NSW Health's response[68] to the proposed set of inclusions and style for reporting, was broadly supportive and provided further evidence of feedback and consultation with NSW Health.

The findings were transmitted to IPART and an email[69] confirms this. IPART confirmed receipt of the information from Sydney Water.[70] While there was no date included on the report, an internal approval memo was provided from Sydney Water which shows sign off by the relevant General Managers. It is noted that the Managing Director's signature is not included on the memo however, the auditor accepted that the Managing Director's approval is evidenced by the signed covering letter to IPART.[71]

Recommendations

There are no recommendations for this clause.

Opportunities for improvement

OFI 2.1.5-1: Include a check to ensure that all required signatures are added to key documents before release.

Element by element discussion of the Framework for Management of Drinking Water Quality

1 Commitment to Drinking Water Quality Management

This element covers the drinking water quality policy, identification of regulatory and formal requirements and identification and engagement with stakeholders. Element 1 requirements are covered in the Drinking Water Management Manual (DWM Manual) at Section 1.

Drinking water policy: Section 1.1 of the DWM Manual covers the drinking water policy. A Drinking Water Policy is included in the DWM Manual at Annexure A.[72] The policy meets the requirements of the framework however, it is noted that while the policy states it is applicable to contractors, *awareness* of the policy does not include contractors:

> *"7. promote awareness of water quality and quantity amongst employees and the community, and ensure staff are trained with cognisance of their role in the supply of drinking water"*

The drinking water framework does not specifically require contractors be included however, given the heavy involvement of contractors in Sydney's water supply system, the policy could be updated to ensure that contractors are also included in the awareness requirements of the policy.

[68] Email_NSWHealth_Comments on draft SWC reporting review_201216.msg
[69] Transmittal to IPART - Operating Licence report on reporting review.msg
[70] TRIMed evidence between IPART and Sydney Water confirming delivery and receipt of the findings relating to clause 2.1.5 (23 December 2016).
[71] Review of water quality public reporting - Dec 2016 - report approvals.
[72] p98.

The policy is current for the audit date scope, with its last approval being 6 April 2016 by the Managing Director. The policy is disseminated to all plants and at the site visit (19 September 2017), the correct version of the policy was sighted at both Nepean and Prospect.

The policy is not available on Sydney Water's website[73] as a standalone document. Under the 'Water and the Environment' section of the policy page, 'environmental', 'sewer mining' and 'stormwater fencing' are included but not the drinking water policy. The drinking water policy is obscured by its inclusion in the DWM Manual. Customers may get an impression that such a policy does not exist. The policy could be removed from the DWM Manual and appended to the website. Further, the March 2016 policy had been added to the DWM Manual but had not been updated in the document history and was still as signed off by the Managing Director at 1 July 2015 creating a perceived currency issue.

Regulatory and formal requirements: Section 1.2 of the DWM Manual covers a summary of the regulatory and formal requirements. The Compliance Accountability Register[74] and the External Requirements Register summarise existing regulatory and formal requirements. Key statutory instruments are included in the Compliance Accountability Register including the *Public Health Act 2010* (NSW) and the *Competition and Consumer Act 2010* (Cth). The External Requirements Register[75] was checked – this document largely pertains to EMS requirements. A key standard, AS/NZS 4020, was not included in the list although we note that it is covered in WSAA (2013)[76], which Sydney Water uses. ADWG updates[77] are covered in Water Forums.

Progress on all Operating Licence and Reporting Manual requirements relating to drinking water is monitored through the Folio of Progress for Drinking Water Management. Reviews are conducted on a six-monthly basis by product specialists, product manager and by the Corporate Compliance team.

SAI Global's 'StandardsWatch' is used to inform business units of changes to standards and codes. An email train[78] was sighted (from SAI to the IMS Team) as evidence and we note that an upcoming update on AS/NZS 4020 was informed to Sydney Water and sent to the relevant staff in networks for information.

Production meeting discussions, performance standards, Toolbox Meetings and position descriptions are used to embed awareness of staff and contractors. An excellent set of Toolbox minutes was sighted at the Prospect site visit.

Responsibilities are covered in position descriptions. A sample was provided and checked for inclusion of drinking water and responsibilities and found to be sound.[79] Training is also provided to increase awareness. Certificates were provided for two personnel as evidence of attendance at IWES Best Practice Drinking Water Quality Management (February 2017). See also Element 7. Contribution development plans for two staff members were sighted and provided evidence that water quality (product quality) responsibilities are embedded at appropriate levels for the position (Level 4 manager and a direct report).

Changes to the water quality regulatory environment are discussed at the Public Health Joint Operational Group and Public Health Strategic Liaison Group. Changes to documents are managed through BMIS.[80] A slide presentation on implementing the ADWG Framework at Prospect was given

[73] https://www.sydneywater.com.au/SW/about-us/our-publications/policies/index.htm.
[74] Compliance Accountability Register.pdf, 2017 version sighted.
[75] SWEMS0003.01 External Requirements Register.docx
[76] WSA 201 Selection and Application of Protective Coatings.pdf, p25.
[77] Minutes - Water Forum - Q1 2017_draft.docx
[78] 3 May 2017.
[79] Position Description - Service Planning Analyst.pdf; Position Description Manager Service and Asset Strategy.pdf; Position Description Manager, Product and Asset Management.pdf; Position Description Plant Manager Level 1 and 2.pdf; Position Description Production Officer A - D.pdf; Position Description Service Delivery Officer 6.pdf.
[80] SDIMS0008 Document Management Procedure.docx was also sighted as part of this element.

and aspects tested and verified during the Prospect site visit. A Framework gap analysis[81] has been undertaken for all of the Sydney Water and contractor operated plants, to check implementation – gaps have been noted.

Engaging stakeholders: Engaging stakeholders is covered at Section 1.3 of the DWM Manual. Stakeholder management is guided by procedure[82] SDIMS0006 and policy[83] SWIM 554785. Stakeholders were involved in the precursor to the DWM Manual (the Drinking Water Quality Management Plan). This review was checked by the auditors in 2015. For the purposes of this audit date scope, the MoU[84] with NSW Health was endorsed on 5 August 2016 to reflect changes to drinking water clauses in the Operating Licence 2015-2020. NSW Health is satisfied[85] that Sydney Water has met its obligations under the Operating Licence and the MoU.

IPART approached several of Sydney Water's stakeholders for comment on Sydney Water's performance. Letters[86] were provided to the auditors from EPA, DPI Water and NSW Health. These stakeholders were broadly comfortable with Sydney Water's performance during the audit date scope. Evidence was provided to support engagement.[87]

Various mechanisms exist for engaging with other key stakeholders including WaterNSW, key contractors and Sydney Desalination Plant Pty Ltd. An example of the procedure for risk review between Sydney Water and WaterNSW was provided as an example of engagement.[88]

This element is considered fully compliant for both clause 2.1.1 and 2.1.2.

2 Assessment of the Water Supply System

This element covers assessment of the water supply system, water quality data and the need to undertake a hazard identification and risk assessment.

Water supply system analysis: System analysis is covered at Section 2.1 of the DWM Manual. This section provides an overview of Sydney Water's system. The DWM Manual states that teams of appropriate people are assembled at the time of each risk review. Catchment to consumer (C2C) risk reviews are completed every 5 years.[89] This item was covered in the auditors' review in 2015 and details have not changed, although at the interviews it was confirmed that a mid-term review will be undertaken shortly.

Sydney Water provided a wealth of evidence to confirm that the C2C overarching flow diagram had been groundtruthed by helicopter and that inputs to the C2C risk assessment had been developed and used in the workshops. Evidence was also provided to show that NSW Health had been present

[81] Water Futures (2017) Water Futures Gap Analysis Report.pdf, p7 and Appendix A.
[82] SDIMS0006 Customer, Regulator and Stakeholder Management.docx. This procedure was current for the audit date scope (Version 3 February 2017).
[83] 554785-Community Stakeholder Engagement Policy.pdf, current for the audit date scope (29/08/2016).
[84] http://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mdq3/~edisp/dd_047318.pdf, sighted 11/09/2017.
[85] H17_59760 NSW Health submission SWC audit.pdf.
[86] Brief - Operational Audit 2016-17 WaterNSW and Sydney Water.pdf; H17_59760 NSW Health submission SWC audit.pdf; Metropolitan Infrastructure - Sydney Water Operating Licence - 2015-2020....pdf.
[87] 583464 - DW Quality Compliance and Performance Report_15-16.pdf; 613235 - Q4 Drinking Water Quality Report - NSW Health.pdf; 614392 - Agenda JOG 29 May 2017.pdf; 614549 - Minutes JOG 29 May 2017.pdf.
[88] BMIS0249 Sydney Water and WaterNSW Risk Review.docx, 04/01/2015, next review due 2018 therefore, current for the audit date scope.
[89] Catchment to Customer 2014.pdf, Table 1, p9.

at the C2C risk workshops.[90] However, for our audit samples, we were unable to establish certain Framework-required aspects, and these are described below.

Local plant risk assessments are conducted by plant teams and stakeholders as required. Evidence was reviewed for both Nepean and Prospect WFPs that risk assessments had occurred. Evidence was sighted to verify that operational personnel were present at the recent Nepean risk assessment although NSW Health or WaterNSW were not present at the workshop. The fact that only operational personnel conducted the risk assessment, is not fully Framework-compliant nor does it accord with Sydney Water's own Corporate Risk Procedure.[91]

Flow diagrams were provided in terms of overview[92] and specific items. At the site visit, we walked through the plants and checked the layout against the flow diagrams provided. There was no current Element 2-compliant flow diagram for the Nepean plant (SCADA screenshots were provided) so the working draft flow diagram (out of audit date scope), currently being developed as part of the gap analysis project, was used. Further details on the plant walkthroughs are provided at Appendix A. The flow diagram for Prospect[93] had no sign-off on the diagram itself although evidence was sighted at the site visit to show an acceptable electronic sign-off within the management system (although it was not clear whether a field verification audit had been undertaken). The SCADA screenshots for Nepean did not exactly match the working draft flow diagram. There was no evidence of 'veracity check' for the SCADA flow diagram. It was confirmed that no briefing material had been used as an input for the Nepean risk review (which does not accord with Sydney Water's own Corporate Risk Procedure)[94] therefore, given the recent upgrades to the Nepean water filtration plant, it was not possible to confirm if the risk assessment had been undertaken for the upgraded system.

Attendance evidence for the Prospect risk assessment was not provided but was[95] for the Nepean 'KnowRisk' risk update. It was confirmed that the Prospect risk assessment had been completed within the audit date scope.[96]

See following section for collation of pertinent characteristics.

Assessment of water quality data: Water quality data assessment is covered at Section 2.2 of the DWM Manual and hazard identification risk assessment at Section 2.3. Several systems are used for storing data (includes Business Intelligence system, IICATS, LIMNOS Actions database to capture daily water quality exception action reports and SCADA). Data is analysed and reported variously externally and internally e.g. quarterly reports are prepared for NSW Health. The Drinking Water Quality Monitoring Program[97] is used as the basis for gathering historical data. Quarterly Water Forums and incident debriefs are held at which water quality data and incidents are reviewed. Nepean's water quality data are summarised in the quarterly reports. Evidence for Nepean source

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[90] C2T 5 year review workshop 1 Rev 2.pptx; C2T 5 year review workshop 2.pptx; C2T 5 year review workshop 6 V3.pptx; C2T 2014 indiv controls.xlsx; C2T 2014 indiv controls.xlsx.pdf; C2T Inspection Route Maprev1.pdf; C2T Review Procedure V6.docx; C2T risk register and summary_SCA_05.xlsx; C2T Workshop 5 Scenario V3.pptx; CTT risk register_networks_05 June 14.xlsm.

[91] QMAF0081- Corporate Risk Management Procedure-2016.docx, version 2, p2 Section 2.2: "*Consider a wide range of views, ideas and insights to ensure a broad breadth of risks are thought of eg subject matter experts in addition to the core team to participate in the risk review process. This helps to raise business awareness of your risks and risk management strategies. Stakeholders could include staff, contractors and service providers, other government agencies, regulators, business partners and technical specialists*."

[92] http://www.sydneywater.com.au/SW/water-the-environment/how-we-manage-sydney-s-water/water-network/index.htm (sighted during the audit date scope and 11/09/2017).

[93] PP-001 Plant and Process Overview.pdf

[94] QMAF0081- Corporate Risk Management Procedure-2016.docx, version 2, p3 Section 2.3: "*Collate relevant resources and background information prior to the risk assessment to ensure that you can properly assess all potential risk sources and drivers. The may require specific historic data analysis or consultation with relevant subject matter experts*."

[95] Attendance Register_ RA Workshop Nepean WFP.pdf

[96] 21 October 2016.

[97] Comprising Annual Drinking Water Quality Operational Monitoring Plan and Annual Drinking Water Quality Monitoring Plan.

and finished water was sighted[98] and confirmed. At the site visit it was confirmed that although risk assessments are completed annually, there is no briefing paper or other inputs for the risk assessment. Therefore, it is not clear exactly how the water quality data are fed into the risk assessment process.

Hazard identification and risk assessment: Hazard identification risk assessment are covered at Section 2.3 of the DWM Manual. Catchment to consumer risk assessments are completed five-yearly (see above). It is not clear how quarterly reports are used in the catchment to consumer risk assessment if the review only occurs once every 5 years (noting that there is a mid-term review planned). Risk reviews between Sydney Water and WaterNSW[99] are captured in a procedure. The procedure states that a risk review form (Table 1) is completed. There was no risk review form in the procedure for us to check. Sydney Water notes that:

> *"New risks are assessed and considered at regular quarterly forums to be added to risk assessments on an as-needs basis."*

There was no evidence to track how new risks are added to the risk register (no comment or specific identifier for line items) although information provided from the JOG and Water Forum meetings shows that risks and emerging risks are discussed.[100] Table 1, referenced in the Sydney Water and WaterNSW risk review procedure, is a means of tabulating such information but was missing from the document.[101] Clarification was sought and it was noted that the table had been omitted from the risk review procedure, the table was later provided as evidence but its use could not be verified in practice.[102]

An operational risk review[103] from Prospect was provided as evidence. The date was confirmed at the site visit as being 21/10/2016. Sydney Water was not involved in the risk assessment but Suez was involved in the overall catchment to consumer risk assessment. The operational risk register did appear to include correct events and controls. It is noted that a new, more tailored water quality risk register is now being developed which was sighted at the site visit and provided later.[104] All registers are now being reviewed to ensure integration across Sydney Water's business.

Methodology and policy for risk[105] are set out in two documents. Another document also exists which includes the frequencies for review.[106] For the catchment to consumer risk assessment, the methodology is as stated in the outcomes report from 2015. The Nepean risk assessment review provided was conducted within the audit date scope (May 2017).

A catchment to consumer risk assessment is conducted every five years however, this frequency may not be iterative enough to capture changes (although we note a mid-term review of the catchment to consumer risk assessment is about to be undertaken). The catchment to consumer risk assessment report defines the methodology used for that risk assessment (as noted in our 2014-2015 operational licence audit). The DWM Manual[107] states that individual asset and business level risk assessments are reviewed and revised at a higher frequency, although the review frequency was not clear in the documentation. In the audit date scope we were only able to verify that the Nepean

[98] 614989 - Qrtly Drinking Water Quality Report (CCR) Q4 16-17.pdf, Table 10, Table 25 raw water, Table 26 treated water, Table 57.
[99] BMIS0249 Sydney Water and WaterNSW Risk Review.docx, 04/01/15, next review 04/01/18.
[100] Agenda - Water Forum - Q2 May2017.docx; Minutes - Water Forum - Q2 2017.docx.
[101] Table 1 in BMIS0249 Sydney Water and WaterNSW Risk Review.docx, 04/01/15.
[102] C2T Review Procedure V6.docx (4 January 2015 – draft, not signed off).
[103] PWFP Operational Risk Register.pdf
[104] Water Quality Risk Assessment and CCPs PWFP version 1.xlsx (05/09/2017).
[105] QMAF0003 Risk Management Policy (31/03/2016) QMAF0018 Risk Matrix (06/12/13 – OUT OF SCOPE, next review should have been 06-12-2015 – confirmed by Sydney Water that a risk overhaul is underway which is why the document had not been updated, but it was current for the audit date scope).
[106] QMAF0081- Corporate Risk Management Procedure-2016.docx (version 2, 28/10/2014).
[107] DW Management Manual, p24.

WTP risk assessment had occurred. The risk matrix document provided as evidence is currently being reviewed[108] but noted as current for the audit period.

The Framework notes that review of hazards and risks is important on system change. The KnowRisk summary provided[109] has not changed since the operational licence audit in 2015. The controls identified as 'SCA' (Sydney Catchment Authority) in KnowRisk[110] may therefore have changed and/or focus shifted since WaterNSW was formed and therefore, these controls should be re-assessed.[111]

Ability to inadvertently bypass Prospect WFP (albeit accepted as unlikely) is not recognised as an event (it is however recognised as a control and bypass procedures are accounted for in the operational risk register for the plant).

The risk assessment reviews for Nepean and Prospect were discussed during the site visit, especially in terms of preventive measures. For both Nepean and Prospect, public health risk assessment is undertaken as part of an overall operational risk review including reputation, performance, environment and safety risks. By grouping all categories of risk in a half day workshop, diligence must be applied to ensure that risk to drinking water quality are robustly identified and assessed. We note that for Nepean, even though the risk review was undertaken in May 2017 i.e. after formation of WaterNSW, there are still references to the WaterNSW and State Water predecessor – Sydney Catchment Authority. The risk review should have taken the opportunity to change the references as some of the controls may have changed and/or focus removed from certain areas, presenting a possibility that control robustness may also have changed.

This element is considered high compliance for clause 2.1.1 and adequate for clause 2.1.2.

3 Preventive Measures for Drinking Water Quality Management

This element covers the need to understand and identify all preventive measures and multiple barriers in place in the water supply system and to identify which of those are critical control points.

Preventive measures and multiple barriers: Section 3.1 of the DWM Manual covers preventive measures and multiple barriers. Preventive measures are covered in Element 2 above. Sydney Water notes that it is not responsible for the overall catchment to tap supply chain, some of the controls are undertaken by other agencies such as WaterNSW, Sydney Desalination Plant Pty Ltd (when operating) and the contractor-operated plants (noting the latter are under contract with Sydney Water). The framework states that all components of the supply chain should be understood and assessed regardless of whether they are under the control of the organisation. For the most part, we could verify that each component of the overarching supply chain had been included in the catchment to consumer risk assessment but note the issues relating to agency changes as stated in Element 2, which have the potential to impact on controls and how effective they might be.

Critical control points: Section 3.2 of the DWM Manual covers CCPs. Sydney Water covers CCPs in one overarching document - Drinking Water Product Specifications. This document provides a comprehensive outline for why CCPs, operational control points (OCPs) and other elements were chosen – and therefore provides a good overview of how Sydney Water meets the requirements of Element 3. As noted in Appendix A and Element 4, the critical limits at the plants match the requirements in the document while allowing for flexibility in SCADA to manage operational

[108] QMAF0003 Risk Management Policy (31/03/2016) QMAF0018 Risk Matrix (06/12/13 – OUT OF SCOPE, next review should have been 06-12-2015 – confirmed by Sydney Water that a risk overhaul is underway which is why the document had not been updated, but it was current for the audit date scope).
[109] QC states "Extracted from Knowrisk on 11-March-2015".
[110] CatchtoCustomer Risk Register_150316_summary.xlsm
[111] It is noted that a mid-tem review of the catchment to consumer risk assessment is planned, so assessment of controls will be captured there.

requirements (a feature that is allowed for in the CCP document). CCPs were also supplied[112] for WaterNSW. Prospect is in the process of revising its risk assessment and CCP processes[113] and these were viewed at the site visit (See further discussion in Element 4). While the CCP document was updated in June 2017 to note the change in reporting to NSW Health, footnote 2 under Table 1 still needs to be updated as it still notes:

"Free chlorine Ct is reported to NSW Health annually (see Table 2)"

However, the update in the document history table notes that the change made was as follows:

"Requirement to report Ct to NSW Health on request (with notice) rather than annually."

This element is considered fully compliant for both clause 2.1.1 and 2.1.2.

4. Operational Procedures and Process Control

This element's focus is on having the correct operational procedures in place for a range of management issues including equipment capability and maintenance and materials and chemicals management.

Operational procedures: Section 4.1 of the DWM Manual covers operational procedures. Because Sydney Water has a number of key stakeholders in its catchment to tap system, there are various interfaces which need to be managed operationally. Sydney Water's own operational procedures are managed through the SDIMS (as work instructions, SOPs etc) and these are referenced as relevant, throughout the elements in this 'element by element review'. As part of the QMS clause audit, we were also able to sight how the SDIMS links with and supports other parts of Sydney Water's products and services. A screenshot of procedures[114] for the Prospect plant and a list of documents for Nepean[115] were provided as evidence of some of the procedures, forms etc in use at those plants – these and their use were sample-checked at the site visits (see Appendix A). Operational procedures for the source (and its control) are managed by WaterNSW with communications through to Sydney Water. The WaterNSW CCPs for the source were provided as evidence.[116] Critical control points for WaterNSW, Nepean and Prospect were viewed (for Nepean and Prospect these were also confirmed on SCADA and for Nepean, on the office wall). Records for training in the drinking water quality event management procedure were provided and are referenced in Element 7.

Operational monitoring: Section 4.2 of the DWM Manual covers operational monitoring. As mentioned above, there are a range of procedures (e.g. work instructions, forms) which support operations, encompassing operational monitoring.

Corrective action: Section 4.3 of the DWM Manual covers corrective actions. Sydney Water notes that it manages corrective actions through some key documents. Some of these have been reviewed as part of Element 6[117] and training records on the drinking water quality event management process were reviewed in Element 7. In addition, Sydney Water utilises a number of unit process guidelines (UPGs) which also include troubleshooting guides. An example for coagulation flocculation was provided and checked.[118] Prospect's incident management framework (including corrections for the purpose of this component) was checked in Element 6 and training in Element 7. IICATS / SCADA and SCADA (Topkapi) for Nepean and Prospect respectively are used to monitor the

[112] Currency confirmed through viewing minutes of meeting between Sydney Water and WaterNSW Minutes - CCP validation meeting 12 May 2016.DOCX.
[113] WQ Risk Assessment CCPs issue 1 (not yet approved).
[114] PWFP Screenshot of Integrum Operations Procedures.pdf
[115] BMIS - Nepean Document List.xlsx.
[116] Currency confirmed through viewing minutes of meeting between Sydney Water and WaterNSW Minutes - CCP validation meeting 12 May 2016.DOCX.
[117] E.g. WPIMS5228 Drinking Water Quality Event Management Plan.pdf
[118] WTHQ5024 UPG Coagulation Flocculation.pdf, trouble shooting guide was included (issue 2, 13/4/15).

process and are aligned with CCP limits (checked at the site visits). Alarms alert at set levels depending on the process and the CCP. Sydney Water's CCPs were sighted on the wall at the Nepean site visit, a practice which helps to embed good visibility and awareness of the CCPs.

Equipment capability and maintenance: Section 4.4 of the DWM Manual covers equipment capability and maintenance. Evidence to support how Sydney Water manages its assets and planned maintenance is provided under clause 4.1 and therefore not repeated here. However, we did check the use of preventive maintenance requests during the site visit (see Appendix A) and these were found to be in order with good records management noted. We also sighted and checked the Nepean WFP five-year asset maintenance and renewal plan.[119] Equipment calibration, process monitoring, procedures and lists[120] were provided and their use checked at the site visits for both the Nepean and Prospect sites. The findings are detailed in Appendix A. While most of the documents confirmed as being for the use stated in the detailed questionnaire responses, there was one document which did not accord: WTNE5006.02 Daily Rounds and Lab Sample Form.xls (2/3/15) was actually the Monthly Safety Inspection sheet.

Materials and chemicals: Section 4.5 of the DWM Manual covers materials and chemicals. Sydney Water has a range of ways in which it manages the requirements of this component. In particular, we reviewed Sydney Water's technical specification in place for both civil works[121] and mechanical works.[122] Both of these documents were checked and found to contain clauses relating to the need to show compliance with appropriate material and chemical standards. For instance, CPDMS0023[123] was checked and found to include requirements for adherence to 'AS 4020'[124] requirements.[125] The technical specifications also reference the WSAA standards as well as Sydney Water's supplements. WSA 201 references both AS 4020 and NSF/ANSI 61 Drinking Water System Components – Health Effects. A range of procurement information was provided including from Sydney Water's contractor Suez. The procurement information is sound and meets the requirements of this component.[126] The bulk chemicals receipt procedure[127] was sighted and checked for Nepean WFP. Verbal confirmation of the procedure for bulk chemicals' receipt was provided by the Plant Manager at Prospect.

5 Verification of Drinking Water Quality

This element covers how verification monitoring of the system is undertaken including assessment of customer satisfaction, short-term evaluation of results and how corrective actions are taken in response to findings.

Drinking water quality monitoring: Section 5.1 of the DWM Manual covers drinking water quality monitoring. Sydney Water has a statutory obligation to follow the Reporting Manual for the operating licence which states that an Annual Drinking Water Quality Monitoring Program must be developed as part of the Drinking Water Quality Management System. Sydney Water provided several pieces of evidence for this component including its Drinking Water Quality 5 Year Plan,[128] its

[119] Nepean WFP 5 year plan for asset maintenance and renewal.xlsx.
[120] E.g. WTNE5006 Process and Equipment Monitoring.pdf (version 10, 25/8/17 – noting that while out of date scope, the document history shows that the last revision would have been in place for the audit date scope and that major changes were not made); WTNE5012 Chemical Drop Test.pdf (version 5, 6/5/16); WTNE5006.01 Daily Water Quality Monitoring Log Sheet.pdf (out of date scope, 25/7/17); WTNE5033 Master Equipment Calibration List.pdf (version 2, Issue Date: 25/08/2017 out of date scope).
[121] CPDMS0023 Technical Specifications Part 1 Civil Works.pdf, version 7, 2/7/14.
[122] BMIS0209 Technical Specification Part 2 Mechanical Works.pdf, version 9, 22/2/17.
[123] CPDMS0023 Technical Specifications Part 1 Civil Works.pdf, version 7, 2/7/14.
[124] Noting that this should be AS/NZS 4020.
[125] E.g. at clause C4.1.
[126] PC-06 Chemical Procurement.pdf (Issue 7: 11th March 2016); PC-06A Incoming Chemical Inspection Sheet.pdf (Issue 5 : 11 March 2015); PC-06B Chemical Specification.pdf (Issue 14: 27 February 2015).
[127] WTNE5003 Receiving Bulk Chemicals.pdf (version 7, 17/2/16).
[128] 496317 - Drinking Water Quality 5 Yr Plan 2016-2017.doc.

Annual Drinking Water Quality Monitoring Plan[129] and zone population sites[130] showing how sites had been added or subtracted based on ABS figures and information gained from monitoring results. Analytes, frequency and the determination of sites appear sound. We note however that there are still multiple references to SCA in the Drinking Water Quality 5 Year Plan.[131] Further, p29 of the same document has no mention of Sydney Desalination Plant's responsibility for reviewing radionuclides in the source water. This document should be reviewed and references to appropriate stakeholders added as required. We note that Sydney Water and Sydney Desalination Plant Pty Ltd are reviewing monitoring at Shaft 11 (handover point between the two parties).[132]

Consumer satisfaction: Section 5.2 of the DWM Manual covers consumer satisfaction. We reviewed much of the information relating to this component within clause 5 and also as part of Element 8. In addition, it was noted that Sydney Water undertakes reviews of complaint information[133] and uses that information to help undertake proactive works where clusters of complaints are noted.

Short-term evaluation of results: Section 5.3 of the DWM Manual covers short-term evaluation of results. Area Water Quality Scientists are responsible for managing water quality complaints and Sydney Water was able to provide evidence to support training and competency in this area.[134] Sydney Water manages short term evaluation of results and subsequent actions through a number of routes including daily exception reports, investigations to exceptions and site-specific WFP procedures for process monitoring and daily review of water quality results. We were able to verify that processes at Nepean and Prospect WFPs were implemented in practice and good records were sighed to support this (see Appendix A). Sydney Water supplied evidence to show how an incident relating to customer complaints caused by hydrocarbon permeation of a water main was identified and followed up within the audit date scope.[135]

Corrective action: Section 5.4 of the DWM Manual covers corrective actions. As the majority of this component is covered by Element 6, it is covered in the following Element rather than repeating the information.

This element is considered fully compliant for both clause 2.1.1 and 2.1.2.

6 Management of Incidents and Emergencies

This element covers setting out what constitutes an incident for the organisation and having appropriate communication and response protocols in place to deal with any incidents that may arise – including learnings from the incident to avoid it happening again.

Communication: Section 6.1 of the DWM Manual covers communication relating to incidents and emergencies. Sydney Water and Suez provided a range of materials relating to contacts and communication in the event of an emergency, even down to the level of snake handling. We were able to verify that incidents are discussed with stakeholders such as NSW Health. In its letter to IPART (25/8/17), NSW Health noted that communication and public messaging has improved with the convening of a Communication Reference Group in October 2016. We were also able to verify communication with NSW Health at other levels including participation in scenario training exercises

[129] 547082-Annual Drinking Water Quality Monitoring Plan 16-17.pdf.
[130] 614913 - Zone population sites 2016-2017.xls.
[131] 547082-Annual Drinking Water Quality Monitoring Plan 16-17.pdf, last column, e.g. p22.
[132] Water Supply Agreement meeting minutes 28 July 2017SDP (minutes of meetings on the review of SWC Monitoring Plan. The meeting was originally scheduled for June, but postponed/rescheduled twice, finally held 28 July 2017. The action 04/16.7 indicates the action came from WSA meeting in April 2016 – Action No 7.)
[133] Example of consolidated information from June 2017 sighted (BI - Network Performance Report - June 2017.pdf).
[134] Interview evidence for one staff member from December 2016 (signed off February 2017); PBP0001-Development Planning for Water Quality Scientists.doc, version 2, 03/06/2016; PBP0001.01 WQS Development Roster Rotation 2017.pdf signed off 3/12/16.
[135] Investigation - Hydrocarbon Permeation (Grenfell Pl).pdf. We note that this event occurred in June 2017 however, the document title states June 2016.

and discussion of outcomes of the training exercise in the JOG meeting.[136] Areas for improvement identified through the exercise included communication improvements between the agencies and NSW Health (both veracity and consistency).

Incident and emergency response protocols: Section 6.2 of the DWM Manual covers communication relating to incidents and emergencies. Sydney Water has in place several documents and systems for managing incidents and emergencies.[137] WPIMS5228 Drinking Water Quality Event Management Plan (WQEMP) also includes responsibilities for the BOO plants and SDP. The event table (Appendix 1) within the WQEMP describes the types of events for treatment that may occur, the potential water quality impact, responsible officer, response, reporting and incident trigger. All appear sound other than the following:

- There is what appears to be a query[138] left in the table for the incident trigger for disinfection
- The event relating to fluoride exceptions does not contain a reference to reporting requirements of the Fluoride Code (i.e. Form 5 for an exceedance >1.5 mg/L).[139] An issue was noted with the emergency response plan relating to consistency with the Fluoride Code of Practice, further details relating to this are discussed under Clause 2.3.

To test response protocols, a scenario training exercise (Exercise Facultas) was held in April 2017.[140] Evidence was provided to show the involvement of NSW Health, WaterNSW and Sydney Water. As mentioned above, outcomes from the scenario were discussed at the JOG.[141] A potential issue with currency of the EM0010 Sydney Water Incident Response Plan[142] was checked with Sydney Water, the response was:

> *"The IRP (EM0010) was the active document at the time of Exercise Facultas. It has since been superseded with the Emergency Mgt Procedure (D0000507). The review date indicates March 2016 was the date that the IRP document was last reviewed. Sydney Water can confirm that the document was in currency & should have been issue 6 not 5 (the error is in the issue number). It was current at the time of the exercise, but has now been archived as it's been replaced by D0000507 Emergency Management Procedure."*

This change should be reflected in the DWM Manual and checked at the next operational licence audit.

Several examples of evidence were provided to show implementation of incident reporting and follow-up.[143] Protocols are in place with WaterNSW and a copy of the WaterNSW critical control points was provided as evidence. The content appears sound and the layout of the critical control points means that they are easy to read and understand what is required. The critical control points were presented to the JOG May 2016.

Training in Standard Incident Procedures was noted at the site visits and records were checked at Nepean to confirm that training had occurred within the audit date scope (see Appendix A).

Procedures were provided from Suez which confirmed that processes and procedures for managing and responding to water quality incidents are in place at Prospect.[144] Training in the procedures was

[136] 614549 - Minutes JOG 29 May 2017.pdf, p6.
[137] WPIMS5228 Drinking Water Quality Event Management Plan (version 13); WPIMS5228.01 DWQ Incident Management Contacts; WPIMS5274 Triggers Notification & Actions-Adverse WQ Results; HOG5214 Online monitoring & control-water assets via IICATS; HOG5215 Reporting Equipment Faults, SWIRL for incident records.
[138] WPIMS5228 Drinking Water Quality Event Management Plan (version 13), p17, last column, second line down.
[139] Also specifically missing from Appendix 2 of the WPIMS5228 Drinking Water Quality Event Management Plan (version 13).
[140] Exercise Facultas 2017 Report and Recommendations.pdf; Exercise Facultas Concept Document Version 2.pdf.
[141] 614549 - Minutes JOG 29 May 2017.pdf, p6.
[142] The purpose of this plan is to help assist in the effective management of all levels of incidents including emergencies.
[143] E.g. WPIMS5274.01 E.coliInvReport 21 Orleans Cres - Toongabbie.docx; Permeation of contaminants through plastic pipes.msg (email discussing issue with hydrocarbon permeation).
[144] ER-P-IMP-100 Incident Management Plan.pdf; ER-P-IMP-600 Water Quantity Quality Failure-SOC Notification.pdf; ER-P-IMP-600-A PWFP Early Warning Report_Chlorine Exceedance.pdf.

not checked however, awareness of water quality responsibilities is an integral part of the Toolbox meetings (see Appendix A).

Security at both site visits was evident (see Appendix A).

This element is considered fully compliant for both clause 2.1.1 and 2.1.2.

7 Employee Awareness and Training

This element covers employee awareness, involvement and training for all involved in the water supply delivery chain.

Employee awareness and involvement: Section 7.1 of the DWM Manual covers employee awareness and involvement. A commitment to awareness of drinking water quality was sighted in the policy (Element 1). Sydney Water notes that it achieves awareness of drinking water quality through a number of mechanisms including induction, newsletters, key stakeholder forums and specific groups such as the Drinking Water Leadership Group and the Water Forum. We have tested the existence of the drinking water policy and minutes from meetings (JOG, Water Forum etc) in other elements and will not repeat this here. Awareness of water quality was also tested as part of reviewing clause 5.

Employee training: Section 7.2 of the DWM Manual covers employee training. Training records were sighted at the site visits (see Appendix A) and viewed as part of the evidence suite provided by Sydney Water. Specific training has been given such as the emergency scenario training (see Element 6), attendance at IWES courses,[145] training in unit process guides and other procedures.[146] Training evidence was also provided and checked from Suez.[147] Suez provided a training matrix[148] cross-referencing training requirements against roles, including National Water Package certificate requirements. A training record[149] provided evidence that Prospect staff had been trained in drinking water quality event management by Sydney Water. The training record form could be improved through addition of the role of each attendee to better integrate their responsibilities within the Drinking Water Quality Management System. Training records were noted for other areas which support appropriate functioning of the Drinking Water Quality Management System (Element 10).

Evidence was sighted to show that Sydney Water undertakes audits of training and an opportunity for improvement was noted during the Nepean audit[150] which looked at training and noted that competency needs[151] to be addressed. Linkages from the contribution and development plan at the higher level could be strengthened from a product quality perspective. There appears to be a high focus on safety and emergency/incident procedures rather than water quality awareness. An issue was also picked up as part of auditing clause 2.2.[152]

This element is considered fully compliant for both clause 2.1.1 and 2.1.2.

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[145] IWES Best Practice Drinking Wate Quality Management for February 2017 were provided for two staff members.
[146] Training record_ UPG Coagulation Flocculation.pdf (15/05/2017); Training records_ Procedures and Contingency Plans Nepean WFP.pdf (7/12/16).
[147] HR-004 Induction.pdf; HR-005A PWFP Training Attendance Register DWQEMP.pdf; HR-P-005 PWFP Training Matrix procedure.pdf.
[148] HR-P-005A PWFP Training Matrix.pdf (Feb 2016).
[149] HR-005A PWFP Training Attendance Register DWQEMP.pdf, 14/7/2017.
[150] Audit A0000059-Nepean Audit Report.xlsx.
[151] "*…training needs for team members must be established to demonstrate that the team members are deemed competent in operating the plant.*"
[152] "*To help ensure that further oversights in the management of backflow prevention for recycled water customers do not occur, we will be carrying out refresher training with the Business Customer Representatives responsible for managing recycled water customers. This will cover general roles and responsibilities as well as placing an emphasis on the effective management of backflow prevention devices.*"

8 Community Involvement and Awareness

This element covers understanding the community's water quality needs and perceptions including having effective two-way communication programs in place.

Community consultation: Section 8.1 of the DWM Manual covers community consultation. Table 8-1[153] details Sydney Water's key engagement strategies including reporting and purpose. Sydney Water has a number of ways in which it consults with the community. In terms of developing a strategy for effective engagement, Sydney Water has a Community and Stakeholder Engagement Guidelines document.[154] Sydney Water also has a statutory requirement[155] to form, and consult with, a Customer Council.

Communication: Section 8.2 of the DWM Manual covers consultation. Records of consultation were tested and confirmed, as part of assessing clause 2.1.5. Meeting records are also kept on Sydney Water's website[156] as is its overall approach for engaging with customers. We note that the Managing Director is the chair of the Customer Council which demonstrates organisational commitment to the process. As well as the Customer Council, Sydney Water also consults with businesses through the Business Customer Forum. Sydney Water has a strong social media presence. We also tested communication as part of assessing clauses 5.1.2, 5.2.4, 5.4.3 and 5.8. As an organisation which prides itself on customer experience, the evidence presented for this element supports Sydney Water's approach and shows that the philosophy is well-embedded. Element 8 achieves full compliance for consistency and implementation.

This element is considered fully compliant for both clause 2.1.1 and 2.1.2.

9 Research and Development

This element covers the requirement to periodically investigate the water supply system through targeted studies involving where necessary, validation and re-validation of processes to ensure that they are still providing water that is fit for purpose at that step in the supply chain. Design of equipment is also covered to ensure that design meets appropriate industry codes and standards, produces water that is fit for purpose and does not provide a source of risk to the water production process.

Investigative studies and research monitoring: Section 9.1 of the DWM Manual covers investigative studies and research monitoring. This component has a clear focus on increasing understanding of a water supply system, to help identify and characterise potential hazards, and to fill gaps in knowledge. Sydney Water notes that it has a dedicated research function within the Corporate Strategy group and that a number of research projects have emerged from the catchment to consumer risk assessment and via the Project Management Improvement Framework[157] (PMIF). The purpose of the PMIF is:

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[153] Pp57-58.

[154] We note that the Community and Stakeholder Engagement Guidelines.pdf (2014) should have been reviewed 10 April 2016 but were not. We have picked up this issue under Element 10.

[155] *Sydney Water Act 1994*, s. 15. (1) An operating licence must also include terms or conditions that require the Corporation to establish and regularly consult with one or more Customer Councils, each consisting of persons appointed from time to time by the Corporation.
(2) The Corporation is to consult with the Customer Councils from time to time, as the Corporation thinks fit, in relation to the provision of the systems and services referred to in this Part.

[156] https://www.sydneywater.com.au/SW/about-us/our-organisation/who-we-are/customer-forums/index.htm. Minutes from September 2016, December 2016, March 2017 and June 2017 were sighted on the website. We reviewed the minutes from September 2016 in detail.

[157] BMIS0214 Product Management Improvement Framework.pdf, version 4, 16 June 2017.

"To document the principles for identifying and delivering evidence-based improvements to the management of Sydney Water products governed under the product management systems."

We checked Sydney Water's methods of capturing and implementing actions under Element 12. We were able to track items noted in the KnowRisk file[158] relating to colour and natural organic matter (NOM) in the Product Management Improvement Register.[159] We were able to track the NOM project through checking of the NOM Roadmap presentation.[160] However, other potential actions noted in the catchment to tap KnowRisk register were not sighted in the Product Management Improvement Register.[161] We were not able to track the origin of improvement actions without looking through all the line items of KnowRisk as there is no identifier in the Product Management Improvement Register which clearly shows how the improvement item originated. Opportunities for improvement have been captured under Element 12.

Validation of processes: Section 9.2 of the DWM Manual covers validation. This component involves evaluating the scientific and technical information that is available on processes and then, where necessary, undertaking further investigations in order to validate system-specific operational procedures, critical limits and target criteria. The aim of process validation is to ensure effective operation and control. We note that Sydney Water provided a range of evidence to support their implementation of this area including CT models developed for each plant and the development of CCPs based on sound limits and that performance against CCPs is reported to NSW Health as per the procedure.[162] We note that validation appears to be mainly catchment-treatment focussed. An issue was noted with monitoring of the backflow prevention[163] control on which Sydney Water partly relies to protect its network. Backflow prevention is listed as part of the suite of Sydney Water controls assessed in KnowRisk to reduce residual risk from ingress events, to acceptable levels. Backflow prevention is listed in the Drinking Water Product Specifications[164] as system integrity control. The backflow prevention program may not now be as robust as assessed in the 2014 catchment to tap risk assessment and should be re-validated.[165] This issue also highlights the risk of having a low frequency of assessment from catchment to tap. This issue is covered further under Element 2 to prevent double-counting.

Design of equipment: Section 9.3 of the DWM Manual covers design of equipment. This component notes that research and development should be undertaken to validate the selection and design of new equipment and infrastructure, or to confirm design changes necessary to improve plant performance and control systems. Sydney Water has a technical specification in place for both civil works[166] and mechanical works.[167] CPDMS0023[168] was checked and found to include adequate requirements for civil works in relation to this clause, general design requirements are included at C1.4 and C10. BMIS0209 was also found to contain adequate design requirements. Sydney Water also conducts pilot testing where required. Upgrade works to facilitate improvements in function were noted at the Nepean site visit.

This element is considered fully compliant for both clause 2.1.1 and 2.1.2.

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[158] E.g. line items 434, 691.
[159] 548309 Product Management Improvement Register.xlsx.
[160] NOM Roadmap.pptx (presented to Water Leadership Group, 1 July 2016).
[161] Line item 553 in Knowrisk (CatchtoCustomer Risk Register_150316_summary.xlsm), actions noted relate to distribution risks including flow reversals and undertaking a local network specific risk assessment.
[162] IMS0152.01 Drinking Water Product Specifications.pdf, version 3.
[163] See clause 2.2.
[164] IMS0152.01 Drinking Water Product Specifications.pdf, version 3, p9.
[165] ADWG (version 3.3, p54) "Revalidate processes periodically or when **variations** in conditions occur". [our emphasis].
[166] CPDMS0023 Technical Specifications Part 1 Civil Works.pdf, version 7, 2/7/2014.
[167] BMIS0209 Technical Specification Part 2 Mechanical Works.pdf, version 9, 22/2/2017.
[168] CPDMS0023 Technical Specifications Part 1 Civil Works.pdf, version 7, 2/7/2014.

10 Documentation and Reporting

This element covers the management of documentation and records and the requirement for internal and external reporting on water quality outcomes.

Management of documentation and records: Section 10.1 of the DWM Manual covers management of documents and records. Documentation is controlled through Sydney Water's BMIS with scheduled frequencies for review. For the most part, documents provided as evidence met currency requirements with some exceptions.[169] Sydney Water has two key procedures[170] for this component and is currently also developing and implementing a QMS (see clause 7 for more information). Sydney Water takes the approach of having <5% of active documents expired[171] as its KPI. Sydney Water explained how it uses a list of three criteria to identify a more manageable list of documents, for which it uses the <5% KPI. Evidence was provided on screen to show how for the most part, Sydney Water meets its criterion. The KPI and criteria approach, as well as the various inconsistencies noted, are considered acceptable given the volume of information Sydney Water is required to manage. SWIM is Sydney Water's principal record management system. Records (as a download from Compass) were provided as evidence of training in record keeping.[172] We note that several inconsistencies in document control and content were noticed however, we accept that for the quantum of evidence reviewed, the gaps appear to be within tolerable limits.

Reporting: Section 10.2 of the DWM Manual covers reporting. Reporting is managed through the Compliance Reporting Procedure[173] (regulatory reports required by IPART) and the Corporate Compliance Program (see Element 1). Reporting to various stakeholders occurs through forums such as the JOG and SLG and to top management (covered elsewhere including at Element 12). The DWM Manual includes a good summary of Sydney Water's reporting requirements in Tables 10-1[174] and 10-2.[175] Evidence of reporting was also reviewed as part of clause 2.1.5.

This element is considered fully compliant for both clause 2.1.1 and 2.1.2.

11 Evaluation and Audit

This element covers the longer-term evaluation of results and system audit to allow for identification of longer term trends and system improvements as required.

Long-term evaluation of results: Section 11.1 of the DWM Manual covers long-term evaluation of results. Sydney Water is required to report on a range of issues relating to drinking water. Depending on the objective, control charts and trends are used to analyse and evaluate key drinking water and drinking water management system parameters. Reports to a range of internal (see Element 12) and external stakeholders were provided as evidence for this component including NSW Health[176] and IPART. The procedure for how Sydney Water and WaterNSW conduct risk reviews[177] shows how information is collated to feed into the risk review however, Table 1 (which provides an example of the risk review input information) was not present in the document. Further comments

[169] E.g. the Community and Stakeholder Engagement Guidelines.pdf (2014) should have been reviewed 10 April 2016 but were not. The risk document (QMAF0018 Risk Matrix.docx) should have been reviewed 06-12-2015 but as explained at the interviews, it is undergoing an overhaul to provide more granularity to the risk matrix.
[170] SDIMS0008 Document Management Procedure.docx; version 5, March 2017; SDIMS0017 Records Management Procedure.docx, version 4 last updated August 2017 although document history shows that previous update was February 2017 and therefore, still in audit date scope.
[171] SDIMS0008 Document Management Procedure.docx.
[172] 'Recordkeeping Awareness - Your piece of the puzzle' in Compass-Records Management Training Register 21 Aug 2017.xlsx, the evidence was reviewed for audit date scope and found to be in compliance.
[173] SDIMS0015 Compliance Reporting Procedure.docx, version 3 15/02/2017.
[174] p67.
[175] P68.
[176] 613235 - Q4 Drinking Water Quality Report - NSW Health.pdf, 1 April 2017 to 30 June 2017).
[177] BMIS0249 Sydney Water and WaterNSW Risk Review.docx.

on long-term analysis for feed into risk assessments is covered in Element 2. Further information on how feed in information is collated for management reviews is provided below in Element 12.

Audit of drinking water quality management: Both Sydney Water and the contract site reviewed (Prospect) have audit procedures and schedules in place, looking at aspects of the drinking water management system. Further information on this aspect was also reviewed as part of auditing the QMS clause (clause 7). Sydney Water provided its audit procedure[178] as evidence. We confirmed that the procedure includes aspects[179] pertinent to management of the drinking water system. Audit reports and approaches were also reviewed as part of auditing clause 2.3 (fluoride component) and therefore will not be considered further here. In the audit date scope, Sydney Water conducted an externally-mediated[180] Framework gap analysis of all its plants. We reviewed the gap analysis report and agreed with the findings that – "*there is some room to improve efficiency and consistency*".[181] We note that Sydney Water has already established a program of work to address the identified gaps including the flow diagrams as noted in Element 2 (and also noted by us as a gap against Framework requirements).

Evidence to show how Suez (Prospect Water Filtration Plant) undertakes audits was viewed at the site visit.

This element is considered fully compliant for both clause 2.1.1 and 2.1.2.

12 Review and Continual Improvement

This element covers the need for oversight and review of the system from senior management, including the Board and the development of a formalised drinking water management improvement plan to document and plan for system improvements.

Review by senior executive: Section 12.1 of the DWM Manual covers review by the senior executive. Top management reviews occur throughout the year and at various levels including up to the Board. The auditors checked the various components of evidence which Sydney Water provided to support this section. Sydney Water notes that endorsement of the DWM Manual and the drinking water policy supports the requirement for top management review (though sign off by the Managing Director). However, it was noted that the latest iteration of the DWM Manual (addition of the revised policy at Annexure A) was not signed off by the Managing Director (but was checked as being updated in the BMIS by Service Planning Manager Supply Products on 19/04/2017). Sydney Water provided an overarching drinking and recycled water review presentation as evidence of the review that had been delivered to senior management.[182] The review was comprehensive and also showed areas where Sydney Water needed to improve its system maturity (e.g. Element 2 and Element 7). Evidence provided to support clause 2.1.5 also shows that top management signed off on the water quality reporting review.

Drinking water quality management improvement plan: Section 12.2 of the DWM Manual covers the improvement plan and actions. Sydney Water has several ways in which it addresses this component. For instance, outcomes of risk assessments and other forums such as the Water Forum, SLG and the JOG meetings[183] are used to identify and communicate improvement actions. Further, interface meetings with contractors are held monthly and feedback items are provided at those

[178] SDIMS0010 - Audit and Inspection Procedure.docx; updated March 2017.
[179] E.g. - *Risk Management; - Incident Preparedness (Facilities and equipment, scenario testing, training); - Communication ; - Assurance and Monitoring (Audits & Inspection) ; - Monitoring & Measurement (Sampling & Testing, Online Monitoring, Alarms); - Corrective, Preventive, and Improvement Actions.*
[180] Water Futures Gap Analysis Report.pdf; February 2017 (Landscape Appendix Document alignment to ADWG Framework V3 BOO Version +AS.docx).
[181] Water Futures Gap Analysis Report.pdf; February 2017, p7.
[182] Agenda Mgt Review 15-16.docx.
[183] 614392 - Agenda JOG 29 May 2017.pdf; 614549 - Minutes JOG 29 May 2017.pdf; Agenda - Water Forum - Q2 May2017.docx.

meetings – Sydney Water has dedicated contractor management staff to this end and we note the commitment in this area. Evidence was also provided to support ongoing discussion and action of improvements.[184]

We checked the evidence and found Section 12.2 of the DWM Manual to be accurate and consistent with the Framework requirements and that a Product Improvement Framework[185] is in place. It is noted however, that there are currently at least three instruments[186] for capturing improvements, these being:

- Product Management Improvement Register
- ADWG Improvement Plan
- DWQMP Improvement Plan

Sydney Water has single point of capture systems for other areas (e.g. SWIRL, CMS). Having multiple means for capturing drinking water improvements sometimes leads to an inability to track and trend key information. For instance, having at least three improvement instruments means it is not always possible to track the origin of improvements in such documents and the instruments could benefit from integration – an opportunity for improvement has been captured to reflect this (it is noted that integration is also Sydney Water's goal).

We further tested linkages between risk assessments and the Product Management Improvement Register. We were able to track the NOM project through checking of the NOM Roadmap presentation.[187] However, other potential actions noted in the catchment to tap KnowRisk register were not sighted in the Product Management Improvement Register.[188] We were not able to track the origin of improvement actions without looking through all the line items of KnowRisk as there is no identifier in the Product Management Improvement Register which clearly shows how the improvement item originated.

This element is considered fully compliant for both clause 2.1.1 and 2.1.2.

[184] DWQMP Coordination Workshop June 2017 Minutes V2.docx; DWQMP progress Meeting_MoM - 5 Sep 2017.doc (out of audit date scope but accepted as evidence of an ongoing process which commenced within the audit date scope).
[185] BMIS0214 Product Management Improvement Framework.pdf, version 4, 16 June 2017.
[186] 548309 Product Management Improvement Register.xlsx; ADWG Improvement Plan.pdf; DWQMP Improvement Plan.pdf.
[187] NOM Roadmap.pptx (presented to Water Leadership Group, 1 July 2016).
[188] Line item 553 in Knowrisk (CatchtoCustomer Risk Register_150316_summary.xlsm), actions noted relate to distribution risks including flow reversals and undertaking a local network specific risk assessment.

Clause 2.2 – Recycled Water: Water Quality

Table B-7. Clause 2.2.1 compliance grade

Subclause	Requirement	Compliance grade
2.2.1	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). [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.]	High compliance

Risk	Target for full compliance
Waterborne outbreaks from mismanagement of recycled water quality still occur in the developed world. Environmental impacts from mismanaged of recycled water may have cumulative impacts. The risk posed to public health and the environment from non-compliance with this clause could be significant.	Systems and processes in place to identify the requirements of the Australian Guidelines for Water Recycling in Sydney Water's context, a system, document or other which meets the intent of a Drinking Water Quality Management System and evidence to show how these requirements have been maintained

Evidence sighted

- 10010049-000-LGCRW - SW design & ownership.pdf
- 10010049-001-012 LGCRW - SW drawing 2.pdf
- 10010049-008 LGCRW Barometric Loop - SW drawing 3.pdf
- 3200-0133--EM-001 AWTP OEMP.pdf
- 3200-0133-PEP-001 AWTP Incident and Emergency Plan.pdf
- 402427 - Liverpool Golf Club agreement.pdf
- 402431 - Warickfarm Racecourse agreement.pdf
- 528774 - Recycled Water Scheme Improvement Register.pdf
- 548309 Product Management Improvement Register.xlsx
- 549518 Copy of 03-08-16 to 11-08-16 Rouse Hill Sales.xls
- 549518 Rouse Hill Sales.xls
- 549551 - Annual Return St Mary's AWTP Draft.pdf
- 550564 - Liverpool Irrigation Scheme Monthly Report June
- 598850 - AWTP Risk Assessment Report.pdf
- 605148 - Liverpool _Briefing Paper _ Risk Workshop.pdf
- 605478 - Recycled Water Quality Monitoring Plan 2017-18.pdf
- 613231-Q4 RW Quality Monitoring Report for NSW Health 16-
- 614392 - Agenda JOG 29 May 2017.pdf
- 614549 - Minutes JOG 29 May 2017.pdf
- 614549 - Minutes JOG 29 May 2017.pdf
- 614607 - Liverpool _ Risk Assessment Report.pdf
- 615224 - AWTP Briefing Paper - Risk Workshop.pdf
- 615580-RW Quality Compliance and Oprtnl Monitoring Plan
- ACP0026 Sewerage code of Australia.pdf

- ACP0028 Water Supply Code of Australia.pdf
- ACP0166 Supplement to WSA 201 Technical Specification.pdf
- Additional TSS Meter Meeting Minutes and Change Mgmnt
- Agenda JOG 14 Aug 2017_FINAL.pdf
- Agenda Mgt Review 15-16.docx
- Annual Declaration for Warwick Farm Racecourse .pdf
- Annual declaration June 2017 _ Liverpool Golf Club.pdf
- Annual Declaration June 2017_Warwick Farm Racecourse.pdf
- Annual management review 2015-16_v5.pptx
- Annual Recycled Water Quality Compliance and Performance
- AWTP AMPRO ORP calibration.pdf
- AWTP AMPRO ORP calibration.pdf
- AWTP CAL Mode Procedures.pdf
- AWTP Daily Sampling Sheet.pdf
- AWTP DCS Overview and HTRW pH limits.pdf
- AWTP DCS Training Quiz.pdf
- AWTP FDS.pdf
- AWTP Incident Escalation Process.pdf
- AWTP Maintenance Schedule- AMPRO records July 17.pdf
- AWTP Maintenance Schedule- AMPRO records June 17.pdf
- AWTP Maintenance Schedule- Asset Overhaul Program 2017.pdf
- AWTP Maintenance Schedule- Asset Renewal Program 2017.pdf
- AWTP Monthly Report Appendix N- Approved Chemical List.pdf
- AWTP Operations Plan.pdf
- AWTP PIRMP + IEP review and training record.pdf
- AWTP PIRMP + IEP review and training record.pdf
- AWTP Plant Operation Assessment- ORP Calibration.pdf
- AWTP Plant Operation Assessment.pdf
- AWTP Posted Procedure-Tracking HTRW Shut and Restart Plant.pdf
- AWTP Process Meeting Minutes-Ammonia Control RO Feed.pdf
- AWTP SCADA Training Notes.pdf
- AWTP SIP - Bomb Threat.pdf
- AWTP SIP - Hazardous Chemical Release.pdf
- AWTP SIP - Trade Waste Contingency.pdf
- AWTP SOP - pH Meter Calibration.pdf
- AWTP SOP for Chemical Metering Pumps.pdf
- AWTP SOP for Chemical Tanker Unloading.pdf
- AWTP SOP for Sampling of the Feedwater Balance Tank.pdf
- AWTP SOP Register.pdf
- AWTP SWMS Register.pdf
- AWTP Training Register RWQEMP.pdf
- AWTP_Validation _Appendix C Microbial Validation Monitoring.pdf
- BCS0054 Liv. Golf Club and Race Course RWQMP trng 310817.pdf
- BCS0342 Liverpool Golf Club Inspection Report 30 May 2016.pdf
- bcs0364_Memorandum of Understanding Sydney Water and DFS.pdf
- BI - Network Performance Report - June 2017.pdf
- BMIS - Liverpool Document List.xlsx
- BMIS - WQ0003 Liverpool RWQMP Screen Shot.pdf
- BMIS_SDIMS0008_Administration.pdf
- BMIS_SDIMS0008_Audit Trail and Review Process.pdf
- BMIS_SDIMS0008_Document Details.pdf

- BMIS0209 Technical Specification Part 2 Mechanical Works.pdf
- BMIS0214 Product improvement framework.docx
- BMIS0260 Recycled Water Management Manual.pdf
- BMIS0260.01 Recycled Water Policy.pdf
- BMIS0260.02_Mapping of documentation to AGWR.xlsx
- BMIS-AWTP RW0005 Western Replacement Flows RWQMP Screenshot.pdf
- CCP0005 Risk Based Compliance Technical Requirements.pdf
- CMS - Cross Connection 1 Macquarie Pl Kellyville.docx
- CMS-Cross Conn 118-120 Hannans Rd NARWEE Rainwater tank.docx
- CMSRS37 - Detailed Service Requests 16-17.xls
- Compass - Liverpool RWQMP Training Record.xlsx
- Compass - Training Record.pdf
- Compass_RWQMP e-learning training packages screenshot.pdf
- Compass-Records Management Training Register 21 Aug 2017.xlsx
- Compass-Training records-AGWR.xlsx
- Compliance Accountability Register.pdf
- Compliance Inspection January 2017_Liverpool Golf Club.pdf
- Compliance Inspection Report Nov 2016_Warwick Farm Racecourse.pdf
- CPDMS0023 Technical Specifications Part 1 Civil Works.pdf
- Cross connection presentation 2017 Final.pdf
- Cross connection process review meeting minutes 270417.docx
- D0000096 Recycled Water Product Specifications.pdf
- D0000096_Recycled water product specifications_v2_May 2017.docx
- D0000184 Unloading chemical from tankers SOP.pdf
- DC-TOHQ0015.doc
- DOC0001 Online instrmnt calib. SOP-Liverpool Training record.pdf
- DOC0001 Online Instrumentation Calibration SOP.pdf
- DOC0201 Liverpool WRP LRV Monitoring Plan.pdf
- EKAMS daily exception email screenshot.PNG
- EM0010 Sydney Water Incident Response Plan.pdf
- Email to and from NSW Health_Update four-year schedule RWQMP.pdf
- E-Training Package _ AWTP _ RWQMP.pdf
- E-Training Package _ Liverpool _ RWQMP.pdf
- E-Training-Recycled Water Quality Event Mgmnt Plan (RWQEMP).pdf
- Evidence of SW maint of LGC pipeline - RW Ops - WO 11532179.rtf
- Example of EKAMS exceedance 19-01-17.pdf
- Exercise Facultas 2017 Report and Recommendations.pdf
- Exercise Facultas Concept Document Version 2.pdf
- Final - Corporate Performance Report _2016-17 (non-financial).pdf
- Final Health SLG minutes 23 September 2016.pdf
- Final Update four year schedule RWQMP_NSW Health Q4 2016_17.docx
- FW Update four year schedule RWQMP_NSW Health Q4 2015_16.msg
- Health SLG minutes 13 Dec 2016.pdf
- IMS Audit Plan - 2016 - 2017.xlsx
- IMS Monthly Report 20170706.xlsx
- IMS Monthly Report_June 2017_CD Dashboard Snapshot.pdf
- Items 3.2 Sydney Water_DWQ&RWQ update_JOG 29 May 2017.pdf
- IWES Training Certificate - Staff.pdf
- July Customer Delivery Performance report for June 2017 Data.pdf
- Key documents review-210817.xlsx
- Land Suitability Assessment - Liverpool.pdf

- LGC RW DWG Rising Main Pipeline Rev1 - SW drawing 4.pdf
- Liverpool Ct Model sanpshot.pdf
- Liverpool Golf Club OEMP.pdf
- Liverpool Golf Club Recycle Main to LGC - Owned by SW.pdf
- Liverpool golf club soil analysis 2016-2017.pdf
- Liverpool golf club soil analysis February 2017.pdf
- Liverpool golf club soil analysis June 2017.pdf
- Liverpool golf club water analysis 1st January 2017.pdf
- Liverpool golf club water analysis January 2017.pdf
- Liverpool Golf Course Quarterly Client Report.pdf
- Liverpool Recycled Water Quality Management Plan.msg
- Liverpool_ Risk Assessment Workshop_Presentations.pdf
- Liverpool_Process Meeting Minutes June July 2017.pdf
- LVTP0014 Liverpool Process Monitoring Workflow.pdf
- LVTP0014 Process Monitoring Workflow SOP-Liv. Trng record.pdf
- LVTP0014.01 Daily process monitoring and calibration check.pdf
- LVTP0044 Chlorine Disinfection UPG - Liverpool Training record.pdf
- LVTP0044 Liverpool Disinfection Sodium Hypochlorite UPG.pdf
- LVTP0056 Cond monitoring and maint SOP-Liv. Training record.pdf
- LVTP0056 Liv. Condition Monitoring and Maintenance Workflow.pdf
- LVTP0057 Liverpool SIP Exceedance Non-conforming RW Supply.pdf
- LVTP0057 Nonconforming RW SIP - Liverpool Training record.pdf
- LVTP0067 Liverpool Laboratory Instrument Calibration SOP.pdf
- LVTP0083 Liverpool Induction pack.pdf
- Maximo - Customer complaint monthly report June 2017.xlsm
- Maximo - Liverpool completed WO record.pdf
- Maximo - Liverpool PM records.pdf
- Maximo-Liverpool Corrective action for CCP instrument record.pdf
- MI0134v7.doc
- Minutes - Recycled Water Forum - Q2 Final.docx
- Minutes - Recycled Water Forum - Q3.docx
- Minutes JOG meeting 14 August 2017.docx
- Minutes SLG 17 March 17.pdf
- MoU NSW Health and Sydney Water 2016_approved 050816.pdf
- MP0021 Preparation of Recycled Water Quarterly Reports.docx
- MPMS0108 Process for Developing Product Monitoring Plans.docx
- NSW Health Review outcome - Quakers Hill RWQMP.PDF
- Online UVT analysers _ Report on trial of 6 instruments.pdf
- PAMWP0001 RW Treatment Verification for Pathogen Reduction.pdf
- PBP0001-Development Planning for Water Quality Scientists.doc
- Position Description Business Customer Representative.pdf
- Position Description Manager Service and Asset Strategy.pdf
- Position Description Manager, Product and Asset Management.pdf
- Position Description PAI Manager W and RW.pdf
- Position Description Plant Manager Level 1 and 2.pdf
- Position Description Production Officer A - D.pdf
- Position Description Service Delivery Officer 6.pdf
- Project Plan and Progress - RA, RWQMP, LRV.pdf
- Q4 RW Quality Monitoring Report for NSW Health 16-17.msg
- QMAF0021 - Operational Risks Technical Requirements.pdf
- QMAF0080 - Risk Management Framework.pdf

- Quarterly RW Quality for NSW Health 2016-2017_Q4.pdf
- RE Final RWQMP of Quakers Hill and Recycled water commissioning to Golf course.msg
- Recycled Water Forum - September Agenda.docx
- rouse hill brochure.pdf
- Rouse hill letter master NEW.pdf
- RW Presentation_JOG_Q4 2016-17.pdf
- RW0005-AWTP Recycled Water Quality Management Plan (RWQMP).pdf
- SCADA - Liverpool pages of RW quality.pdf
- SCADA - Liverpool pages Process Monitoring and CCPs.pdf
- Schedule 1 of Liverpool recycle water agreement.pdf
- Schedule 5 Annual declaration Form Liverpool Golf Club.pdf
- Scheme Risk Assessment Update_JOG 29 May 2017.pdf
- screen capture_SWIM RWQ Reports.docx
- SDIMS Monthly Performance Report-Last year.xlsx
- SDIMS0006_CustomerRegulator Stakeholder Management.docx
- SDIMS0008 Document Management Procedure.docx
- SDIMS0012 Management Review.docx
- SDIMS0015 Compilation of Regulatory Reports for CD.docx
- SDIMS0017 Records Management Procedure.docx
- SDIMS0244 Audit Summary Report on RW Management 2016-07-01.docx
- SDIMS0244 RW Consolidated audit checklist and findings_V3.xlsx
- SLG Agenda 23 Sept 2016.pdf
- Staff Review 6 Dec 16 Signed.pdf
- St Mary's_AWTP-datareport to June 2016.xlsx
- ST0009-Liverpool WRP -5YP.xlsx
- StMary's_AWTP-datareport to June 2017.xlsx
- SWEMS0003.01 External Requirements Register.docx
- SWEMS0152 Customer Complaint Procedure.pdf
- SWIRL - 1 Macquarie Ave Kellyville.docx
- Sydney Water Monthly Report for Water Analysis August 2017.pdf
- Sydney Water Quartely Report for Water Analysis June 2017.pdf
- Sydney Water_DWQ and RWQ updates_JOG 14 Aug 2017.pdf
- Training record _ AWTP _ RWQMP.pdf
- Treatment PO Competency Program Plan.pdf
- Update four year schedule RWQMP_NSW Health Q4 2015_16.docx
- Update four year schedule RWQMP_NSW Health Q4 2016_17.pdf
- UV performance verification - Castle Hill WRP - Final.pdf
- UV performance verification - Rouse Hill WRP - Final.pdf
- UV performance verification - Wollongong Stage 2 WRP - Final.pdf
- Warwick Farm Racecourse Quaterly Client Report.pdf
- Wollongong Golf Course - OEMP.pdf
- WOQ5012 v9.docx
- WOQ5162 Managing Water Quality Customer Complaints.docx
- WQ0003 - Liverpool Recycled Water Quality Mgmnt Plan (RWQMP).pdf
- WQ0008 RWQMP - St Marys.docx
- WQS Development Roster Rotation 2017.pdf
- WR0002 RWQMP - Wollongong Stage 1.docx
- WR5271 - Recycled Water Quality Event Management Plan.pdf
- WRHQ5050.01 - Recycled Water Notification Contact List.pdf
- WRHQ5050-Notification of Plant RW Production Interruptions.pdf
- WRHQ5052 RWQMP - Wollongong Stage 2.docx

- WSA 201 Manual for Selection and Application of Protective Coatings.pdf
- WTOC0090 AWTP PIRMP - 2017.pdf

Summary of reason for grade

Sydney Water manages its recycled water through a hierarchy of documents supported by its integrated management system. The Recycled Water Management Manual (RWM Manual) is a roadmap for their recycled water management system and provides the overall corporate management framework relevant to Sydney Water's operational recycled water schemes. The RWM Manual is structured according to the elements, components, and actions set out in the Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (Phase 1) (AGWR) 'Framework for management of recycled water quality and use' (AGWR Framework). This manual is supported by scheme specific recycled water quality management plans and a number of companion instruments including:

- Catchment to customer risk assessment
- Recycled water product specifications
- Recycled water improvement plan
- Supporting policies and procedures

During the audit, we focussed on documentation for St Marys AWTP and Liverpool WRP and undertook a site visit of Liverpool WRP.

We acknowledge the significant effort Sydney Water has undertaken in the development of the recycled water management system including the roadmap and underlying hierarchy of documents. This approach ensures consistency between the scheme while allowing the approach to be tailored to meet specific requirements of each scheme.

Generally, there was strong alignment between the requirements of this clause and Sydney Water's compliance. There were a few minor aspects that are noted as part of the key findings in Table B-8.

Table B-8. Element by element summary of findings for clause 2.2.1

Element	Grade	Key findings
Element 1: Commitment to responsible use and management of recycled water quality	High	This element has been found to have high compliance for clause 2.2.1 due to the lack of clarity regarding the governance of the Liverpool Golf Club pipeline, gaps in the BCR's position description and their responsibilities associated with the safe use of recycled water. There was no evidence of an escalation process when customers are not meeting the requirements of their end user agreements.
Element 2: Assessment of the Recycled Water System	High	Sydney Water has completed a four-year rolling review of their recycled water risk assessment in line with the requirements of this element. The flow diagram for Liverpool WRP was not verified by field audit.
Element 3: Preventive Measures for Recycled Water Management	High	Sydney Water has established that appropriate preventive measures are in place and identified improvement actions for areas where these are required. Critical control points have been established. On-site preventive measures were incorrectly calculated for Liverpool Golf Course and Warwick Farm racecourse. Two prevalidated UV units (Castle Hill and Wollongong) were noted as operating outside their UVT validation range. Shutdown protocols for UVT exceedances below verified UVT ranges for these plants were not sighted.
Element 4: Operational Procedures and Process Control	Full	Sydney Water has well established operational procedures and process control for the treatment and distribution of recycled water.

Element	Grade	Key findings
Element 5: Verification of Recycled Water Quality and Environmental Performance	Full	Sydney Water has developed extensive verification monitoring programs for recycled water quality including the Annual Recycled Water Quality Compliance and Operational Monitoring Plan and internal and external reporting processes for this monitoring. A gap was noted in relation to the receiving environment monitoring on end user sites (with a lack of OEMP for Warwick Farm Racecourse) has been captured in the grade for element 1 as the gap relates to governance rather than verification.
Element 6: Management of Incidents and Emergencies	Full	Procedures are in place for both communication and incident and emergency response protocols.
Element 7: Operator, Contractor and End User Awareness and Training	High	Sydney Water has an extensive training program in place for recycled water management. Formal training and skills maintenance is managed through the contribution and development plan. A competency program is in place for all plant operators, and for Networks Area Water Quality Scientists. Gaps in the identification of training were noted for BCRs for appropriate undertaking of the compliance inspections. During the audit period Sydney Water had developed Compass based e-learning training packages for the scheme RWQMPs to provide training to operators, contractors and end users (although it was not rolled out during the audit period).
Element 8: Community Involvement and Awareness	Full	Sydney Water demonstrated that it had an effective community consultation strategy. A broad range of materials was available to provide advice on safe recycled water use.
Element 9: Validation, Research and Development	Full	Sydney Water has appropriate processes in place for validation research and development
Element 10: Documentation and reporting	Full	Sydney Water demonstrated an appropriate range of documentation and reporting mechanisms for both internal and external reporting.
Element 11: Evaluation and Audit	Full	Sydney Water has appropriate evaluation and audit processes developed and documented in its RWM Manual and supporting documentation.
Element 12: Review and Continuous Improvement	Full	Sydney Water has robust processes documented for the Framework requirements for senior management review. While recycled water improvement actions were captured in the Recycled Water Scheme Improvement Plan, the relationship between this register and the Product Improvement Framework or Product Improvement Register was not clear.

Table B-9. Clause 2.2.2 compliance grade

Subclause	Requirement	Compliance grade
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.	Adequate

Risk	Target for full compliance
Incomplete implementation of the Recycled Water Management System has the potential to result in a high risk to public health and the environment.	Evidence that the Recycled Water 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.

This clause requires Sydney Water to fully implement the Recycled Water Quality Management system developed as a requirement of Clause 2.2.1. Sydney Water must undertake all relevant activities in accordance with the system and NSW Health must be satisfied these requirements have been discharged.

Generally, there was satisfactory implementation of the recycled water management system. Procedures, training in procedures and document management associated with procedures at Liverpool WRP were excellent.

However, management of end user compliance with their obligations was poor. Within the organisation there was knowledge of long term (greater than 1 year) non-compliance with customer obligations. These had been identified through the BCR site visits and logged as part of the BCR action register[189] (an excel spreadsheet). The shortcomings included:

- the lack of a testable backflow prevention device on an unused connection at Liverpool Golf Club (which, if connected, would have had the potential to draw recycled water into the drinking water system)
- no OEMP for Warwick Farm
- annual reporting obligations not being met (for example soil monitoring and water quality data provided not aligning with sampling obligations under the OEMP
- no evidence that Liverpool Golf Club or Warwick Farm Race Course were meeting their documented reporting, auditing and continual improvement obligations.[190]

These issues cut across a number of Elements in the AGWR Framework and are considered in more detail in the element by element discussion. A summary of the findings for each clause are presented in Table B-10.

Table B-10. Element by element summary of findings for clause 2.2.2

Element	Grade	Key Findings
Element 1: Commitment to responsible use and management of recycled water quality	Adequate	The element has been found to have adequate compliance for clause 2.2.2 due to a number of issues associated with poor management and enforcement of the end user agreements including environmental verification monitoring. There was an over reliance on the annual Statutory Declaration provided by End Users that Purchaser Controls had been in place.

[189] Recycled Water customer action tracking scheme.xls
[190] p12, p52, 55WQ0003 - Liverpool Recycled Water Quality Mgmnt Plan (RWQMP).pdf

Element	Grade	Key Findings
Element 2: Assessment of the Recycled Water System	High	Sydney Water has completed a four-year rolling review of the recycled water risk assessments. While NSW Health was not invited to the Liverpool WRP Risk Assessment, they had been invited to risk assessments held within the audit period. During the field audit inaccuracies were noted in the flow diagram for Liverpool WRP.
Element 3: Preventive Measures for Recycled Water Management	High	Sydney Water has generally established that appropriate preventive measures are in place and identified improvement actions for areas where these are required. Critical control points have been established. The need for an OEMP for Warwick Farm was identified in 2014 and has not yet been developed.
Element 4: Operational Procedures and Process Control	Full	Sydney Water has well established operational procedures and process control that are implemented in practice. Records and training associated with element 4 were excellent at Liverpool WRP.
Element 5: Verification of Recycled Water Quality and Environmental Performance	Full	Sydney Water has developed and implemented extensive verification monitoring programs for recycled water quality. A gap was noted in relation to the receiving environment monitoring on end user sites however this was considered in the grade for Element 1.
Element 6: Management of Incidents and Emergencies	Full	Procedures are implemented for both communication and incident and emergency response protocols.
Element 7: Operator, Contractor and End User Awareness and Training	Adequate	Sydney Water provided evidence that it had delivered an extensive training program for recycled water management. However, a number of minor shortcomings were noted in training and associated competence in relation to the end users, BCRs and their managers.
Element 8: Community Involvement and Awareness	Full	Sydney Water demonstrated that it had an effective community consultation strategy and evidence to support its implementation. A broad range of materials was available to provide advice on safe recycled water use.
Element 9: Validation, Research and Development	Full	Sydney Water has been undertaking a range of validation activities during the audit date scope including monitoring of pathogen surrogates to verify plant performance and UVT verification of UV units.
Element 10: Documentation and reporting	Adequate	Issues were noted in maintaining records in the appropriate systems associated with the BCR role and as well as insufficient review and reporting of the information provided in support of the Annual Declaration to identify that the information provided was insufficient.

Element	Grade	Key Findings
Element 11: Evaluation and Audit	Adequate	Sydney Water undertakes a range of evaluation and audit activities in line with the requirement of its RWM Manual and supporting systems. Sydney Water had undertaken an audit of its recycled water system within the audit period and demonstrated that it had closed out most actions associated with the June 2016 internal audit of its recycled water management system. However, a number of minor shortcomings were noted associated with evaluation and audit associated with end users. Compliance Inspections and review of the information that should be provided in support of the Annual Declaration were not being appropriately undertaken, communicated and oversighted to demonstrate adequate management of public health and environment risks by the end users.
Element 12: Review and Continuous Improvement	Full	Sydney Water provided a recycled water review presentation as evidence of the review that had been delivered to senior management. A trail of continuous improvement actions was followed to confirm how Sydney Water tracks the undertaking and completion of actions.

A detailed discussion of the findings to the component level is provided below.

Recommendations

Recommendation 2.2-1: By 30th June 2018, determine the required tasks and associated competencies for Sydney Water staff (both frontline and managers) and contractors who are responsible for confirming the efficacy of on-site public health and environmental preventive measures as documented in the recycled water management system and supporting material.

Recommendation 2.2-2: By 30th June 2018, ensure Sydney Water staff (frontline and managers) and contractors who are responsible for confirming the efficacy of on-site measures are trained and assessed as competent to implement their responsibilities. This includes:

- competencies to confirm customer compliance with the Recycled Water Agreements and RWQMP
- competencies to follow procedures and complete appropriate records.

A process for on-going competency assessment should be established and implemented.

Recommendation 2.2-3: By 30th June 2018, ensure compliance inspections are undertaken with sufficient rigour to provide confidence that end user control requirements (Schedule 3 Purchaser Controls) are being met.

Recommendation 2.2-4:

a) By 31st March 2018, develop an interruption to supply process where end users are not meeting their obligations under their end user agreement and the RWQMP. It is expected this process would include identification of triggers for interruption, considering the risk basis of the non-compliance.
b) By 31st March 2018, review compliance inspections for all sites to identify high risk non-compliances and commence implementation of the interruption to supply process where appropriate.
c) By 30th June 2018, review all recycled water customers to confirm there are no high risk non-compliances with their end user agreement and the RWQMP and implement the interruption to supply process where appropriate.

d) By 30th June 2019, review all recycled water customers to confirm they are meeting their obligations under their end user agreement and the RWQMP and implement the interruption to supply process where appropriate.

Opportunities for improvement

OFI2.2-1: Conduct the assessment of recycled water system maturity across business units to obtain a better understanding maturity throughout the organisation.

Element by element discussion of the Framework for Management of Recycled Water Quality and Use

1 Commitment to responsible use and management of recycled water quality

This element involves understanding regulatory and formal requirements, the development and implementation of a recycled water quality policy, and understanding and engaging with stakeholders.

Responsible use of recycled water: This component requires involving agencies with responsibilities and expertise in protection of public and environmental health and ensuring that design, management and regulation of recycled water schemes is undertaken by agencies and operators with sufficient expertise.

The RWM Manual describes how Sydney Water engages with stakeholders in Section 1.3. Stakeholders relevant to recycled water are listed in Table 1-1 of the RWM Manual. Sydney Water advised that Section 1.3 of each scheme plan also refers to stakeholder engagement, with reference to scheme-specific stakeholders. This was verified for Liverpool RWQMP, St Marys RWQMP, Wollongong Stage 1 RWQMP and Wollongong Stage 2 RWQMP. We noted that NSW Health had not been invited to the Recycled Water Risk Assessment Workshop for Liverpool WRP. While the workshop was held outside the audit date scope, the risk assessment does make up part of the current recycled water management system. NSW Health has advised they have been invited and have attended risk assessment workshops within the audit date scope.

Regulatory and formal requirements: This component requires identification and documentation of all relevant regulatory and formal requirements. Sydney Water should identify the governance of recycled water schemes for individual agencies, designers, installers, operators, maintainers, owners and users of recycled water and ensure that responsibilities are understood and communicated to designers, installers, maintainers, operations employees, contractors and end users. The requirements of this component should be reviewed periodically, to reflect any changes.

Section 1.2 of the RWM Manual summarises the regulatory and formal requirements applicable to the Recycled Water Quality Management System. Regulatory requirements are documented in the Compliance and Accountability Register (CAR). Customer's OEMP or Recycled Water Management System (RWMS) documents the recycled water responsible use to protect public and environmental health. During the Liverpool risk assessment in February 2016 the need for an OEMP for Warwick Farm Racecourse was identified as an action. To date this has not been completed. The adequacy in the implementation and monitoring of the OEMPs for managing public health and environmental risk is discussed below and in Elements 5 and 10.

In the questionnaire Sydney Water stated:

> *"Mandatory training requirements are listed in staff position descriptions. Staff position descriptions are held by human resources. Staff directly involved in managing recycled water quality are trained in relevant procedures contained in SDIMS. "*

During the audit interview it was established that the Business Customer Representative (BCR) undertook compliance inspections of the recycled water customers and was responsible for collecting the information associated with the Annual Declaration (Schedule 5 of the Recycled Water Agreement). This aspect of the BCR role is not captured in the BCR Position Description. The position

description does not contain the training requirements or competencies required for this aspect of work undertaken by the BCR.

No evidence was provided during the audit of an escalation process when customers are not meeting the requirements of their Recycled Water Supply Agreement. The 2016 and 2017[191] Annual Declarations for Liverpool Golf Club were signed under oath even though there was no backflow prevention device on water meter CRWK098 – meaning the Golf Course did not comply with the Additional Purchaser Control requirement to ensure all plumbing works comply with plumbing codes and standards.[192]

These shortcomings show a lack of awareness of the responsibilities and duties referred to in this component of the AGWR Framework by both the customer and the BCR undertaking the compliance inspections. We were formally advised:

> *"Sydney Water ensures that its Recycled Water Quality Management System is fully implemented and that all relevant activities are carried out with respect to customer end use through:*
>
> - *Statutory declarations provided by the customer to Sydney Water*
> - *Annual inspections jointly performed by the customer and Sydney Water….*
>
> *Therefore, Sydney Water has provided all relevant information to the auditor with respect to the control of risk relating to customer end use under the Recycled Water Quality Management System.*

The incongruity of the above advice with the evidence discussed here, and in Elements 5, 7, 10 and 11 points to a discontinuity in organisational knowledge management; known non-conformances are not monitored by management and remediation is not undertaken as a direct result.

The Compliance Inspection Form changed between May 2016 and January 2017. The newer form contained a section to prioritise any actions and a note that all action requests must be formally raised and tracked in BMIS. We did not see evidence of these actions raised in BMIS. During the interview the BCR advised he tracked the actions through a spreadsheet. We did not see evidence that the BCRs had been trained in the new Compliance Inspection Form. We conclude there are issues associated with both training and competency associated with completing the Compliance Inspection Form and logging detected non-conformances.

The Recycled Water Supply Agreement with the Golf Course states that the connection point is at the chlorine contact tank at the Liverpool water recycling plant[193] Other evidence demonstrates this pipeline is owned and maintained by Sydney Water.[194] This arrangement results in a lack of clarity regarding the governance of the pipeline supplying Liverpool Golf Club. The conflicts between these documents results in poor articulation of responsibilities in the flow diagram and unclear responsibilities and risks across this pipeline.

Partnerships and engagement of stakeholders (including the public): Sydney Water has a Memorandum of Understanding (MoU) with NSW Health that formally set out the terms of a cooperative relationship between the parties, establishes their respective roles and facilitates fulfilment of each party's function in relation to the protection of public health. The MoU documents the structure and function of a Strategic Liaison Group (SLG) and Joint Operational Group (JOG). The minutes of these meetings (which are also attended by Water NSW) is evidence of how Sydney Water meets this component of the Framework. Sydney Water ensures liaison with agencies with

[191] Annual declaration June 2017 _ Liverpool Golf Club.pdf
[192] Schedule 3 402427 – Liverpool Gold Club agreement.pdf
[193] Schedule 1 402427 – Liverpool Gold Club agreement.pdf
[194] 10010049-000-LGCRW - SW design & ownership.pdf, 10010049-001-012 LGCRW - SW drawing 2.pdf, 10010049-008 LGCRW Barometric Loop - SW drawing 3.pdf, Evidence of SW maint of LGC pipeline - RW Ops - WO 11532179.rtf, LGC RW DWG Rising Main Pipeline Rev1 - SW drawing 4.pdf, Liverpool Golf Club Recycle Main to LGC - Owned by SW.pdf

sufficient expertise through the Joint Operational Group or Strategic Liaison Group with NSW Health. Sydney Water achieved full compliance with its obligations under the MoU. This aspect is discussed in detail in Clause 9.1.

Scheme Risk Assessment Workshop attendance records the risk assessment team details, stakeholder's involvement (including representative from NSW Health) and Recycled Water Customers (e.g. Liverpool Golf Club). This was verified in Appendix-B (Attendance Register) of the Western Replacement Flows (St Marys AWTP) and Liverpool WRP Risk Assessment Report.

Scheme specific liaison with end users is undertaken through the management of the recycled water contracts by the BCR.

Recycled water policy: This component requires Sydney Water to implement a recycled water policy, endorsed by senior managers and ensure that the policy is visible and is communicated, understood and implemented by employees and contractors. Sydney Water has a Recycled Water Policy[195] which was endorsed by the Managing Director on 6 April 2016. The policy was on display at Liverpool WRP.

The element has been found to have high compliance for clause 2.2.1 due to the lack of clarity regarding the governance of the Liverpool Golf Club pipeline and adequate compliance for clause 2.2.2 due to poor management and enforcement of the end user agreements.

2 Assessment of the Recycled Water System

Intended uses and source of recycled water: This component required Sydney Water to identify source of water, intended uses, routes of exposure, receiving environments, endpoints and effects and consider inadvertent or unauthorised uses.

Sydney Water advised that the Scheme RWQMPs included a description of the source of recycled water, catchment inputs, intended uses of the recycled water, the receiving environment, routes of exposure and inadvertent or unauthorised use and that this information is also included in the final risk assessment report.[196]

Recycled water system analysis: This component requires Sydney Water to assemble pertinent information and document key characteristics of the recycled water system to be considered, assemble a team with appropriate knowledge and expertise and construct a flow diagram of the recycled water system from the source to the application or receiving environments. Sydney Water is also required to periodically review the recycled water system analysis.

Section 3.3 of the schemes Risk Assessment Report described the list of information collated for the risk assessment workshops. We confirmed this for the Risk Assessment Report of the two schemes verified. The Briefing Papers for each scheme risk assessment workshop also collated the information of scheme description, process flow diagram, AGWR target LRV for the scheme, Data analysis of 10 years influent and effluent water quality and critical control points of the scheme. These information feed into the risk assessment of the scheme. We confirmed this criterion was addressed in the Briefing Paper for Western Replacement Flows[197] and Liverpool[198] Risk Assessment.

We noted the team for the Water Quality Risk Assessment for Liverpool WRP did not include representatives from NSW Health and from the workshop register we could not determine if there was appropriate environmental expertise at the workshop.

[195] BMIS0260.01 Recycled Water Policy.pdf
[196] Section 2.1, Western Replacement Flows (St Marys AWTP) RWQMP and Liverpool RWQMP and the Risk Assessment Report of Western Replacement Flows (St Marys AWTP) and Liverpool WRP, Section 2, Appendix-C (Risk assessment register).
[197] 615224 - AWTP Briefing Paper - Risk Workshop.pdf
[198] 605148 - Liverpool _Briefing Paper _ Risk Workshop.pdf

Process schematic diagrams were developed for the two schemes audited. Verification during the field audit of Liverpool WRP showed a number of inaccuracies relating to aspects under the customers control. The AGWR Framework specifically notes that the flow diagrams should "*be verified by field audits and checked by those with specific knowledge of the system*". [199] The Liverpool WRP Risk assessment report noted that the flow diagram was verified at the Risk Assessment workshop.

Assessment of water quality data: The component requires Sydney Water to assemble historical water quality data about sewage as well as data from treatment plants and of recycled water supplied to users; to identify gaps and assess reliability of data. The data needs to be assessed using tools such as control charts and trends analysis, to identify trends and potential problems.

Historical (10 years) water quality data for both influent and effluent water was presented in the Briefing paper for scheme risk assessment workshop, final Risk Assessment Report (Appendix-C) and in scheme RWQMPs. Historical and recent water quality data were compared with Long Term Trigger Values (LTV) of the AGWR and performance targets. Statistical tools were used to assess the historical water quality data for both influent and effluent, and identify any potential problems.

Hazard identification and risk assessment: This component requires Sydney Water to identify all potential hazards and hazardous events for each component of the recycled water system and assess the level of risk they present to human and environmental health. Sydney Water must determine significant risks and document priorities for risk management and evaluate the major sources of uncertainty associated with each hazard and hazardous event and consider actions to reduce uncertainty. Sydney Water must also periodically review and update the hazard identification and risk assessment to incorporate any changes.

Sydney Water completed all the schemes risk assessment in 2015-16 and 2016-17 through a Hazard Identification and Risk Assessment (HIDRA) workshop for each scheme. [200] Sydney Water defined its risk methodology through its Corporate Risk Management Framework [201] to assess the public health and environmental risks associated with the proposed use of recycled water for all schemes. The corporate risk framework includes consequence criteria specific to public and environmental health. The Corporate Risk Management Procedure describes how to implement the framework. Operational Risk Assessment Technical Requirement [202] was used to identify the likelihood and consequence for each hazardous event.

Sydney Water's standardised approach to developing Scheme specific RWQMP means Section 2.4 of the Scheme RWQMPs describes the risk assessment process. The standardised approach extends to the risk assessment reports, with the Risk Assessment Report describing the Risk Assessment Methodology, and Appendix A of the Risk Assessment Report providing the workshop presentation which includes risk assessment methodology. The risk register is contained in an appendix of the Risk Assessment Report.

We noted the risk assessments were very high level, with only 20 risks documented for Liverpool WRP and 15 documented for St Marys AWTP. During the audit interviews we raised our concern at this high-level approach (For example failure of the disinfection process is considered as a single risk, rather than broken into further detail such as equipment failure or high chlorine demand water). Sydney Water told us they have a master list that they draw from so the risks are consistent across schemes. They referred to the Recycled Water Scheme Improvement Register [203], which captured additional risk management actions identified in the scheme specific risk assessments, as evidence

[199] p27 AGWR
[200] Project Plan and Progress - RA, RWQMP, LRV.pdf
[201] QMAF0080 - Risk Management Framework.pdf
[202] QMAF0021 - Operational Risks Technical Requirements.pdf
[203] 528774 - Recycled Water Scheme Improvement Register.pdf

that the workshops considered the risk in sufficient detail. The maximum and residual risk were assessed for each hazard and hazardous event, and were scored using Sydney Water's Operational Risk Assessment Technical Requirement.[202] The risk score for each hazard and hazardous event was recorded in the risk register. Sydney Water's document management system (BMIS) records the review cycle of the RWQMPs which include the Risk Assessment (HIDRA) review.[204]

The element has been found to have high compliance for clause 2.2.1 and 2.2.2 due to the issues with the flow diagrams not being verified by field audits and subsequent inaccuracies.

3 Preventive Measures for Recycled Water Management

Preventive measures and multiple barriers: This criterion requires Sydney Water to identify existing preventive measures system-wide for each significant hazard or hazardous event, and estimate the residual risk, identify alternative or additional preventive measures that are required to ensure risks are reduced to acceptable levels and document the preventive measures and strategies, addressing each significant risk.

Sydney Water's recycled water management system documents the preventive measures in a hierarchal manner. The Recycled Water Product Specifications[205] is an integral part of the overarching Recycled Water Management System. The Specification translates customer, business and regulatory drivers into explicit treatment and network (where relevant), Key Performance Indicators (KPIs).

As part of each scheme risk assessment, Sydney Water identifies and documents the effective preventative measures. The risk assessment framework allowed Sydney Water to determine if the risk was reduced to an acceptable level (or as low as reasonably practicable). Sydney Water has investigated significant effort into standardisation of the risk assessment

Sydney Water has undertaken verification monitoring of the Liverpool WRP. *Clostridium perfringens*, the use of which is acknowledged and supported in the AGWR and by authorities in other countries, was used as a surrogate for protozoa. The WTP achieved a 5th percentile LRV across the plant of 3.7. Monitoring across the chlorine contact tank found an average *C. perfringens* LRV of 2.8 and 5th percentile of 1.7. We caution equating this to *Cryptosporidium* reduction, noting Table 3.4 of the AGWR shows an LRV of 1.0-2.0 for *C. perfringens* and 0-0.5 *Cryptosporidium* associated with chlorination. *Cryptosporidium* reduction may not be as effectively reduced as the *C. perfringens* spores were. US EPA guidance[206] requires much higher Ct than is achieved in the Liverpool contact tank for the equivalent level of *Giardia* reduction (which is less resistant to chlorine than *Cryptosporidium*. Although C. *perfringens* has been removed to the required LRVs we caution claiming this is equivalent to *Cryptosporidium*.

The way the verification results are reported in the Risk Assessment Report[207] could be misinterpreted that end use controls are not required. The AGWR[208] notes unrestricted access and application for municipal use requires "*advanced water treatment"* and that "*disinfection associated with advanced water treatment will typically need to comply with dose specification (e.g. UV) or Cts for disinfectant such as chlorine*".[209]

Advice from NSW Health is: *"The required LRV for the scheme should be achieved through a combination of treatment controls and end use controls."*

[204] BMIS-AWTP RW0005 Western Replacement Flows RWQMP Screenshot.pdf
[205] D0000096 Recycled Water Product Specifications.pdf
[206] US EPA Disinfection Profiling and Benchmarking Guidance Manual (1999)
[207] p12 614607 - Liverpool _ Risk Assessment Report.pdf
[208] Table 3.8 AGWR
[209] p101 Section 3.5.3 AGWR

Customer controls applicable to each site are not well documented in Sydney Water's documentation and consideration is not given to the pathways by which each customer control reduces the public health risk. This results in the maximum LRV's being incorrectly summed (for example buffer zones and spray drift controls will protect neighbours and the passing public but are not the same exposure pathway as no public access during irrigation). This has the potential to over emphasis the effectiveness of end user controls. The lack of clear documentation of the customer controls specific to each site (noted here and under Element 1) make it difficult to verify that the appropriate end use controls are in place during the Compliance Inspections.

Critical control points: This component requires Sydney Water to assess preventive measures throughout the recycled water system to identify critical control points, establish mechanisms for operational control and document the critical control points, critical limits and target criteria.

Critical control points are documented in the Recycled Water Product Specifications as well as the RWQMPs and the Risk Assessment Reports. Critical control points were verified as part of the field interviews. There is a SCADA page where all the critical limit information is displayed (although the association between the on-screen numbers and critical control points was not clear). There was also no trend page set up for the critical limits so it was not simple for the operators to view trends associated with the monitoring parameter associated with the critical limits. We confirmed on-site that the operators could not change the critical limits. The operators were able to simulate an instrument exceedance of a critical limit and demonstrated the operation of the auto-interlocks that prevented supply of out-of-spec recycled water. This confirmed to us the system has good automatic operation of the critical control points.

Sydney Water stated in the questionnaire that "Critical controls points (CCPs) have been established to manage significant risks in recycled water production". The CCPs established for Liverpool are consistent with the broader Australian approach although some of the chosen monitoring parameters differ. None of the critical limits have a close correlation with protozoan inactivation or reduction so there is no operational information that the required protozoan reductions are being achieved. Therefore, we highlight the importance of ensuring the customer controls (established as an operation control point or OCP) are in place, monitored and audited.

The element has been found to have high compliance for clause 2.2.1 and 2.2.2 due to the poor articulation of the end use control specific to each site and the incorrect summing of these controls without consideration for the pathways each end use control manages.

4 Operational Procedures and Process Control

Operational procedures: This component requires that procedures required for all processes and activities applied within the whole recycled water system (source to use) are identified, documented and compiled into an operations manual.

Section 4 of the scheme RWQMPs provide a high-level overview of the operational procedures and process control documents. The WRPs have Unit Process Guidelines (UPG)[210] which specify the corrective actions / process trouble shooting guide for individual process unit operation. Plant operators are trained on UPGs. Sample UPGs and training record were provided as evidence. The training evidence is attached to the UPG in which the staff were trained. At Liverpool these documents were stored in the plant office and the operations staff were easily able to locate requested information. WRPs also have local SOPs for operation and calibration.[211]

Plant production team also monitors the SCADA for process parameters and alarms, and take necessary corrective action as required. Regular process meeting by the plant production team

[210] LVTP0014 Process Monitoring Workflow SOP-Liv. Trng record.pdf, LVTP0014.01 Daily process monitoring and calibration check.pdf, LVTP0044 Chlorine Disinfection UPG - Liverpool Training record.pdf, LVTP0044 Liverpool Disinfection Sodium Hypochlorite UPG.pdf

[211] AWTP AMPRO ORP calibration.pdf, AWTP SOP - pH Meter Calibration.pdf

discuss the operational issues, process checks and non-conformances list and actions. The process Meeting minutes are the record of communication and corrective actions.

Information (including operational procedures) related to key aspects of recycled water are documented and kept in authorised content management systems, including BMIS, SWIM, iconnect (intranet) and Sydney Water web site. A clear mapping of document at action level to the AGWR is maintained.[212]

Operational monitoring: Sydney Water has documented their monitoring protocols for operational performance of the recycled water supply system, including the selection of operational parameters and criteria in Section 5 and Appendix D of the RWQMP for Liverpool and St Marys

A range of operational monitoring activities are undertaken at the WRPs. These are captured through:

- SOPs / Procedures for process operational monitoring[213]
- SCADA / DCS monitoring.

SCADA/ DCS for recycled water quality pages demonstrate the operational parameters, critical limits, trends and alarms which plant operations team regularly monitor as part of daily check. The SCADA pages were reviewed and tested as part of the field audit. A CCP exceedance was simulated and the plant shutdown as appropriate. SCADA CCP limits were checked and found to align with the documentation.

Operational correction: This component requires Sydney Water to establish and document procedures for corrective action where operational parameters are not met and establish rapid communication systems to deal with unexpected events.

Each WRP has SCADA / DCS monitoring for critical and operational parameters, and parameters are set to alarm the operators when the recorded value is outside the operational range. Operators check the trends regularly and take corrective actions as necessary.

Operational corrections are documented in the Unit Process Guidelines (UPG), Functional Design Specification (FDS) specify the corrective actions / process trouble shooting guide for individual process unit operation where operational parameters are not met. Each WRP has a number of SOPs for process operation and corrective actions. Example of procedures of Liverpool WRP and St Marys AWTP were provided and a sample were verified during the field audit and found to be the same version. WRP teams have regular process meeting to discuss and record corrective actions

Rapid communication systems are documented in the site specific Standard Incident Procedure. For events and emergencies, the Recycled Water Quality Event Management Plan[214] also outlines the communication system during any event or emergency. A Notification Contact List[215] is maintained in BMIS for communication during events. Non-conformances in relation to water quality grab sampling data are reported through daily exception reports (EKAMS). This component also links to Element 6 and is further discussed there.

Equipment capability and maintenance: This component requires that Sydney Water ensures that equipment performs adequately and provides sufficient flexibility and process control and that a program for regular inspection and maintenance of all equipment, including monitoring equipment is established.

Equipment are renewed, maintained and calibrated according to Sydney Water Asset Management Plan, Maintenance Schedule and Work Instructions / Standard Operating Procedures (SOPs). Asset renewal, regular maintenance and calibration ensures that equipment performs adequately.

[212] BMIS0260.02_Mapping of documentation to AGWR.xlsx
[213] LVTP0014 Process Monitoring Workflow SOP-Liv. Trng record.pdf
[214] WR5271 - Recycled Water Quality Event Management Plan.pdf
[215] WRHQ5050.01 - Recycled Water Notification Contact List.pdf

SOP's and schedules for equipment calibration have been developed and are maintained in BMIS. Online and laboratory instruments are inspected, cleaned and calibrated on a routine basis. Records are maintained for calibration and maintenance of monitoring equipment as per site specific SOPs. This was sampled during the field verification.

Planned maintenance and inspection for mechanical/electrical assets is scheduled through 'PMs' in Maximo enterprise asset management system. Maximo maintains the records of maintenance and inspection of plant and equipment.

See Licence Clauses 4 for further discussion of Sydney Water's asset management system.

Materials and chemicals: This component required that only approved materials and chemicals are used and documented procedures for evaluating chemicals, materials and suppliers are established.

Bulk chemicals tender contract document provides the list of chemicals and the product specification of the chemicals. There are also Bulk chemicals contract document for each chemical. These documents are technically reviewed by Treatment Product and Asset and managed and controlled by the procurement team in Sydney Water.

Compliance with approved materials is mandated by compliance with relevant specifications and codes. Materials in contact with treated recycled water must meet the same standards as for drinking water including AS 4020 for materials in contact with potable water.

Regular analysis of chemicals is performed to confirm that the supplied products are within product specification.

This element was found to be fully compliant for both clause 2.2.1 and 2.2.2.

5 Verification of Recycled Water Quality and Environmental Performance

Recycled water quality monitoring: This component requires that the characteristics, monitoring points and frequencies are determined.

Section 5.1 of the RWM Manual covers recycled water quality monitoring. Sydney Water has a statutory obligation to follow the Reporting Manual for the operating licence which states that Sydney Water must manage recycled water quality in accordance with Australian Guidelines for Water Recycling: Managing Health and Environmental Risks (2006) (unless NSW Health specifies otherwise) to the satisfaction of NSW Health, any other guidelines specified by NSW Health to the satisfaction of IPART and the manner and form of recycled water quality reporting as specified in the IPART Reporting Manual.

Sydney Water provided several pieces of evidence for this component including its 2016-2017 Recycled Water Quality Compliance and Monitoring[216], that documents process for the monitoring and reporting of recycled water quality for compliance and operational purposes, and a Monitoring Plan in Appendix D of the RWQMP that covers recycled water quality monitoring points and frequency for the Western Sydney Replacement Flows Recycled Water (St Marys AWTP) scheme[217] and Liverpool Recycled Water Scheme[218] and St Marys RWQMPs for monitoring points and frequency. Site specific procedures for sampling and monitoring were provided for the Western Sydney Replacement Flows (St Marys AWTP) Scheme[219] and Liverpool WRP.[220]

Application site and receiving environment monitoring: This component requires that the characteristics to be monitored and the points at which monitoring will be undertaken are determined. The AGWR[221] notes:

[216] 615580-RW Quality Compliance and Oprtnl Monitoring Plan
[217] Appendix D, RW0005-AWTP Recycled Water Quality Management Plan (RWQMP).pdf
[218] Appendix D, WQ0003 - Liverpool Recycled Water Quality Mgmnt Plan (RWQMP).pdf
[219] AWTP SOP for Sampling of the Feedwater Balance Tank.pdf
[220] LVTP0014 Liverpool Process Monitoring Workflow.pdf,
[221] p60, AGWR

Short-term performance evaluation involves reviewing monitoring data and satisfaction of users of recycled water to verify that:

- *the quality of water supplied to application or receiving environments conforms to established targets and meets user expectations*
- *the quality of receiving environments complies with approval conditions.*

In cases of nonconformance, immediate corrective actions or incident and emergency responses should be implemented.

Those responsible for interpreting and recording results should understand clearly how to assess results and, where necessary, communicate them. Results should be reviewed within appropriate timeframes, and should be compared with previous results, established guideline values, and any regulatory requirements or agreed levels of service. Procedures for performance evaluation and recording of results should be established and documented."

Section 5.2 of the RWM Manual covers the application site and receiving environment monitoring. Monitoring required by end users at the application site is set out in scheme OEMPs or land suitability assessment as referenced in the customer agreement. Compliance inspections are scheduled every 6 months and the compliance inspection check list has a line item: "Are soil and ground water impacts monitored as required by customer agreement / customer recycled water management Plan / OEMP?"

Review of the OEMP and soil and monitoring water results provided by Sydney Water for Liverpool Golf Clubs revealed:

- Soil samples that were provided are not being taken from the correct soil monitoring sites
- No groundwater data has been provided
- No evidence was provided for BOD, ammonia, nitrate or faecal coliforms quarterly monitoring
- Only two samples (November 2016 and January 2017) have been provided for other monitoring parameters, rather than the four required.
- pH samples on both occasions were outside the performance limits (above 8.5)

From this evidence we concluded the water quality and soil data supplied did not meet with the water quality and soil testing obligations required under Liverpool Golf Course OEMP. Evidence of timely reporting of the non-conformances in relation to pH was not provided. This is a gap in the adequacy and implementation associated with receiving environment verification, however as it stems from the governance issues associated with Element 1 it has been graded there.

Documentation and reliability: This component requires that a sampling plan is established and documented for each characteristic, including the location and frequency of sampling, ensuring that monitoring data is representative and reliable.

Section 5.3 of the RWM Manual covers documentation and reliability. Section 9 and Appendix 5 of the Annual Recycled Water Monitoring Plan[222] outlines the characteristics, sampling location and frequency of monitoring. Routine Monthly, Quarterly and Annual reporting is performed in accordance with the sampling plan. Actual sample numbers are checked against the plan. Sydney Water produces quarterly report to NSW Health for recycled water quality verification results. Sydney Water also produces monthly and quarterly report for internal and external stakeholders (e.g. recycled water customers) for the recycled water quality verification results.

Satisfaction of users of recycled water: This component requires that an inquiry and response program is established for users of recycled water, including appropriate training of people responsible for the program.

[222] 605478 - Recycled Water Quality Monitoring Plan 2017-18.pdf

Section 5.4 of the RWM Manual covers satisfaction of users of recycled water. Business customers that have entered into Recycled Water Supply Agreements are assigned a Business Customer Representative whom they can contact directly with any enquiries.

Complaints and responses are recorded in Sydney Waters Customer Management System. Sydney Water provided evidence of a customer complaints procedure[223] and a SDIMS Work Instruction to Managing WQ Customer Complaints.[224] Complaint information is reviewed monthly. An example compliant report was provided for June 2017.[225]

Area Water Quality Scientists are responsible for managing water quality complaints for residential schemes. Evidence supporting training of Area Water Quality Scientists was provided.[226] Sydney Water provided evidence of an example staff review. In the interview the value of rotating the Area Water Quality Scientist into different businesses was noted as providing a holistic understanding of their role within the broader provision of safe water.

Short-term evaluation of results: This component requires that procedures be established for the short-term review of monitoring data and satisfaction of users of recycled water and the development of reporting mechanisms internally and externally, where required.

Section 5.5 of the RWM Manual covers short term evaluation of results. Reporting requirements for verification monitoring are detailed in 2016-2017 Recycled Water Quality Compliance and Monitoring.[227] Non-conformances for water quality grab sampling data are reported through daily exception reports[228]. Daily exception notifications are sent to relevant internal stakeholders via the EKAMS actions databases.

The Recycled Water Event Management Plan[229] outlines responses to non-conformances, where results are reviewed and reported monthly in the Network Performance Report[230] and customer complaint monthly report.[231]

Sydney Water provided evidence of process meeting minutes for Liverpool WRP[232] which documents operational issues, process checks and non-conformances list and actions.

Corrective responses: This component requires the establishment and documentation of procedures for corrective responses to nonconformance or feedback from users of recycled water and the establishment of rapid communication systems to deal with unexpected events.

Section 5.6 of the RWM Manual covers corrective responses. Sydney Water provided evidence of identification and management of cross connections between recycled and other grades of water that were identified, including screen shots of CMS Service Request[233], presentation at the August 2017 JOG meeting[234] and a meeting[235] held between Sydney Water, Fair Trading and NSW Health to discuss issues and roles and responsibilities surrounding cross connections.

[223] SWEMS0152 Customer Complaint Procedure.pdf
[224] WOQ5162 Managing Water Quality Customer Complaints.docx
[225] Maximo - Customer complaint monthly report June 2017.xlsm, 'CMS raw data' tab
[226] PBP0001-Development Planning for Water Quality Scientists.doc
[227] 615580-RW Quality Compliance and Oprtnl Monitoring Plan, Section 12.2
[228] EKAMS daily exception email screenshot.PNG
[229] WR5271 - Recycled Water Quality Event Management Plan.pdf
[230] BI - Network Performance Report - June 2017.pdf
[231] Maximo - Customer complaint monthly report June 2017.xlsm
[232] Liverpool_Process Meeting Minutes June July 2017.pdf
[233] CMS - Cross Connection 1 Macquarie Pl Kellyville.docx
[234] Cross connection presentation 2017 Final.pdf
[235] Cross connection process review meeting minutes 270417.docx

Recycled water non-conformances are communicated according to the procedure explained in Recycled Water Quality Event Management Plan.[229] The document covered scheme specific events and listed the actions or response for the event by the responsible officer.

The document Plant Recycled Water Production Interruptions[236] describe the communication and notification process to the recycled water customer. The Recycled Water Notification Contact List[237] provides contact list for all schemes and Sydney Water internal and external agencies. Sydney Water provided evidence of site-specific Standard Incident Procedure for Liverpool WRP.[238] Scheme specific SCADA and 24/7 telemetry monitoring provide capability for corrective response both for routine operations as well as abnormal events, Sydney Water provided evidence for Liverpool WRP[239] and St Marys AWTP[240] SCADA monitoring.

The element has been found to be fully compliant for clause 2.2.1 and 2.2.2.

6 Management of Incidents and Emergencies

Communication: This component requires Sydney Water to define communication protocols with the involvement of relevant agencies, prepare a contact list of key people, agencies and stakeholders and develop a public and media communications strategy.

Section 6.1 of the RWM Manual covers communication. Sydney Water provided a Recycled Water Quality Event Management Plan[241] which outlines communication protocols with all relevant agencies in relation to recycled water events / incidents. A MoU with NSW Health explains the Sydney Water communication protocols with NSW Health on any events in relation to Sydney Water's systems or services. Notification of Plant Recycled Water Production Interruptions[242] describe the communication and notification process to the recycled water customer and a Recycled Water Notification Contact List.[243]

Sydney Water has an Incident Response Plan[244] to manage the incidents and communicate with external agencies. Communication during incidents is in accordance with Incident Management procedures.[241]

Incident and emergency response protocols: This component requires that potential incidents and emergencies be defined and procedures and response plans documented with the involvement of relevant agencies, employees be trained and the emergency response plans are regularly tested and any incidents or emergencies are investigated and protocols revised as necessary.

Section 6.2 of the RWM Manual covers incident and emergency response protocols. Potential events, Notifiable events and Incidents are defined in Appendix 1 and 2 of the Recycled Water Quality Event Management Plan.[241]

The document Notification of Plant Recycled Water Production Interruptions[242] describe the communication and notification process to the recycled water customer during supply interruptions due to planned or unplanned shutdown and event or incidents.

Sydney Water also has overarching Incident Response Plan.[244] Each scheme has site specific Standard Incident Procedure to manage and communicate the events and incidents. Sydney Water

[236] WRHQ5050-Notification of Plant RW Production Interruptions.pdf
[237] WRHQ5050.01 - Recycled Water Notification Contact List.pdf
[238] LVTP0057 Liverpool SIP Exceedance Non-conforming RW Supply.pdf
[239] SCADA - Liverpool pages of RW quality
[240] AWTP SCADA Training Notes.pdf
[241] WR5271 - Recycled Water Quality Event Management Plan.pdf
[242] WRHQ5050-Notification of Plant RW Production Interruptions.pdf
[243] WRHQ5050.01 - Recycled Water Notification Contact List.pdf
[244] EM0010 Sydney Water Incident Response Plan.pdf

provided evidence of an online e-learning training package[245] for the Notification of Plant Recycled Water Production Interruptions and Recycled Water Notification Contact List.

Sydney Water provided evidence of a joint scenario that was held between Sydney Water, NSW Health and WaterNSW on 3rd, 5th and 7th April 2017 to test procedures (noting this was a drinking water scenario).[246]

The element has been found to be fully compliant for clause 2.2.1 and 2.2.2.

7 Operator, Contractor and End User Awareness and Training

Operator, contractor and end user awareness and involvement: This component requires development of mechanisms and communication procedures to increase operator, contractor and end user awareness of, and participation in, recycled water quality management and environmental protection.

Sydney Water developed Compass based e-learning training packages for the scheme RWQMPs to provide training to operators, contractors and end users. The scheme e-learning training module covered the 12-element management framework of the RWQMP. Sydney Water advised that e-learning training packages had being developed and loaded in Compass for Liverpool WRP, Wollongong WRP stage 1 and 2, Rouse Hill WRP and Quakers Hill WRP.[247]

Another three training packages have also been developed and were now in the process to upload in Compass for Gerringong, St Marys AWTP and Castle Hill WRP. Remaining schemes e-learning modules is being produced.

Sydney Water organised a 2-day training course on AGWR for Operators covering the Framework provided by an external water quality expert.

Each scheme WRP also carries out site specific training for the operators to inform the recycled water quality, awareness and management processes.

A process to carry out end user recycled water awareness training is in place. Scheme specific RWQMP training packages have been developed.

Compliance inspections are carried out annually. Part of this inspection is a requirement for the end user to provide evidence that their staff have been trained in the use of recycled water.

Sydney Water also achieves awareness through various other means including risk assessment workshops with treatment operations and recycled water customers, training, site induction programs, newsletters, noticeboards, meetings, internal forums (including Recycled Water Forum), forums with key stakeholders, Sydney Water's intranet, internal social media and emails. The Business Management Information System contains relevant procedures.

Operator, contractor and end user training: This component requires ensuring that operators, contractors and end users maintain the appropriate experience and qualifications, that training needs are identify and ensure resources are available to support training programs. Document training and maintain records of all training sessions.

Sydney Water track**s** and keep records of training and awareness completed by staff via its Compass software platform which is the business's performance and learning development package. Records also kept on site for scheme specific trainings (see the discussion under Element 4).

The gaps in training and competencies surrounding the end user compliance inspections and management were discussed in the Regulatory and formal requirements actions of Element 1.

[245] E-Training-Recycled Water Quality Event Mgmnt Plan (RWQEMP).pdf
[246] Exercise Facultas 2017 Report and Recommendations.pdf
[247] Compass_RWQMP e-learning training packages screenshot.pdf

The element was awarded high compliance for clause 2.2.1 and adequate for 2.2.2 as due to the gaps in training and competencies surrounding the end user compliance inspections and management.

8 Community Involvement and Awareness

Consultation with users of recycled water and the community: This component requires that an assessment of requirements for effective involvement of users of recycled water and the community be undertaken and that a comprehensive strategy for consultation is developed.

Section 8.1 of the RWM Manual covers consultation with users of recycled water and the community. Sydney Water also has a statutory requirement[248] to form, and consult with, a Customer Council. Business Customer Representatives are assigned to business customers using recycled water under Recycled Water Supply Agreements. They act as a point of contact for customers to engage with Sydney Water regarding recycled water.

Communication and education: This component requires that an active two-way communication program be developed to inform users of recycled water and promote awareness of recycled water quality issues, provide information on the impacts of unauthorised use and on the benefits of recycled water use.

Section 8.2 of the RWM Manual covers communication and education. The Customer Council's role is to provide high quality advice on the interests of residential customers and community groups of Sydney Water and on the Customer Contract, in accordance with the terms of the Customer Council charter, and on such other key issues related to Sydney Water's planning and operations. Customer-specific issues are addressed through other processes, for example, with a customer's Business Customer Representative.

Recycled water business customers are involved in the risk assessment for the specific scheme, which includes an assessment of unauthorised uses. The attendance of customers at the risk assessment and the details of the assessment of unauthorised use is documented on the risk register.[249] Scheme Risk Registers are reproduced in scheme RWQMPs.

[248] *Sydney Water Act 1994*, s. 15. (1) An operating licence must also include terms or conditions that require the Corporation to establish and regularly consult with one or more Customer Councils, each consisting of persons appointed from time to time by the Corporation.
(2) The Corporation is to consult with the Customer Councils from time to time, as the Corporation thinks fit, in relation to the provision of the systems and services referred to in this Part.

[249] Appendix – A (Presentation), Appendix-B (Workshop attendance sheet), Appendix- E (Risk Register) of 598850 - AWTP Risk Assessment Report.pdf and 614607 - Liverpool _ Risk Assessment Report.pdf

Sydney Water publishes information on its website[250] to communicate with and educate the community and through fact sheets on recycled water uses.[251] Sydney Water communication changes on recycled water though targeted online and direct mail communications.[252]

Sydney Water utilises education programs to build awareness of recycled water, particularly using the Water Recycling Education Centre at St Marys AWTP. These programs target schools, universities and TAFE, stakeholder and community groups and professional delegations. Educational resources have been developed and are available on Sydney Waters website.

The element was full compliance for both clause 2.2.1 and 2.2.2.

9 Validation, Research and Development

Validation of processes: This component requires that processes and procedures be validated to ensure they control hazards effectively and to revalidate processes when variations in conditions occur.

Section 9.1 of the RWM Manual covers validation of processes. The process for verification is outlined in the PAMWP0001[253], and in Section 9 of the Scheme RWQMP.[254] A detailed verification monitoring program for log reduction values for all schemes was developed and agreed with NSW Health to be implemented by March 2018.[255] Progress for all schemes log reduction values is updated quarterly to NSW Health[256] and is presented at the quarterly Joint Operating Group meeting with NSW Health.[257]

The verification monitoring plan developed and implemented for Liverpool WRP in April – June 2015. The outcomes of the LRV verification monitoring and implementation in CCPs are summarised in section 9.0 of the scheme RWQMP and detail results of the LRV monitoring are presented in Appendix A the RWQMPs.

Western Replacement Flows (St Marys AWTP) verification monitoring was conducted, the summary of the AWTP verification monitoring is presented in section 9.1 of the Western Replacement Flows RWQMP.

Sydney Water has developed a Ct model for each WRP, with evidence provided of the Liverpool WRP Ct model snapshot.[258] Summary of the scheme Ct model and accordingly design conditions for CCPs

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[250] Recycled water – what to consider before setting up a recycled water scheme http://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mdu3/~edisp/dd_057020.pdf); Recycled water network http://www.sydneywater.com.au/SW/water-the-environment/how-we-manage-sydney-s-water/recycled-water-network/index.htm); Producing Recycled Water (http://www.sydneywater.com.au/SW/water-the-environment/what-we-re-doing/recycling-and-reuse/producing-recycled-water/index.htm); Using Recycled Water http://www.sydneywater.com.au/SW/water-the-environment/what-we-re-doing/recycling-and-reuse/using-recycled-water/index.htm

[251] General one for Rouse Hill Recycled Water residential scheme customers: http://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mdgw/~edisp/dd_080939.pdfGardening with Recycled Water http://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mdgw/~edisp/dd_080940.pdf
Using Recycled Water with Fruits and Vegetables http://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mdgw/~edisp/dd_080941.pdf

[252] 549518 Rouse Hill Sales.xls

[253] PAMWP0001 RW Treatment Verification for Pathogen Reduction.pdf

[254] WQ0008 RWQMP - St Marys.docx; WQ0003 - Liverpool Recycled Water Quality Mgmnt Plan (RWQMP).pdf

[255] Project Plan and Progress - RA, RWQMP, LRV.pdf

[256] Update four year schedule RWQMP_NSW Health Q4 2016_17.pdf

[257] RW Presentation_JOG_Q4 2016-17.pdf

[258] Liverpool Ct Model sanpshot.pdf

are discussed in section 9 of the scheme RWQMPs. Sydney Water is currently running LRV verification monitoring for all scheme to inform the design of the scheme CCPs.

Design of equipment: This component requires the design of new equipment and infrastructure be validated to ensure continuing reliability.

Section 9.2 of the RWM Manual covers validation. Equipment must meet Sydney Water's technical specifications.[259] New infrastructure is identified through business cases and is guided by the Facilities Blueprint program. New infrastructure is validated during commissioning. Procedures for commissioning vary depending on asset type, Sydney Water provided a validation report for St Marys AWTP as evidence.[260]

Investigative studies and research monitoring: This component requires the establishment of programs to increase understanding of the recycled water supply system, and use this information to improve management of the recycled water supply system.

Section 9.3 of the RWM Manual covers investigative studies and 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. Scheme specific improvement actions are identified through recycled water risk assessment workshops and during the review of the RWQMP[261] Recycled Water Scheme Improvement Register).

The element was full compliance for both clause 2.2.1 and 2.2.2.

10 Documentation and Reporting

Management of documentation and records: This component requires information pertinent to all aspects of recycled water quality management be documented, a document-control system to ensure current versions are in use be developed, a records-management system be established to ensure that employees are trained to complete records and that documentation is periodically reviewed and revises as necessary.

Section 10.1 of the RWM Manual covers management of documentation and records. Sydney Water manages documentation related to recycled water through a certified Integrated Management System. The documentation is controlled in a BMIS database.[262] All documents in the BMIS system are assigned a review period. Records are saved in Sydney Water systems including SWIM-Records Management system.[263]

Sydney Water provides Records Management Awareness training is provided to new employees as part of the corporate induction, and is a mandatory component of starting work.

An Integrated Management System performance report is produced and circulated to all business managers. This report details all documents in the system and highlights the documents that are either due to expire or already expired for actioning. KPIs have been set and are reported to senior management.

The Compliance Inspection Report for Liverpool Golf Club[264] (provided after the on-site interviews) noted that actions should be raised in BIMS. This conflicts with the information provided during the on-site interviews that the BCR maintains a spreadsheet register of outstanding actions. Sydney Water's response to our query as to why there has been such an extended period of time without backflow prevention on a site where Sydney Water supplied recycled water was:

[259] ACP0166 Supplement to WSA 201 Technical Specification.pdf and BMIS0209 Technical Specification Part 2 Mechanical Works.pdf
[260] AWTP_Validation _Appendix C Microbial Validation Monitoring.pdf
[261] 528774 - Recycled Water Scheme Improvement Register.pdf
[262] BMIS - WQ0003 Liverpool RWQMP Screen Shot.pdf
[263] screen capture_SWIM RWQ Reports.docx
[264] Compliance Inspection January 2017_Liverpool Golf Club.pdf

"The time taken to resolve the backflow prevention matter post May 2016 was a consequence of the Business Customer Representative failing to follow process and create an 'installation request' record in the backflow database at the time of inspection. Creating the backflow database record would have triggered the automatic compliance letter sequence. This oversight resulted in no system generated backflow device installation letters being issued to the customer following the May 2016 inspection."

This issue remained unresolved throughout the audit period and had the potential to pose a significant public health risk should that connection have been active during a depressurisation event.

Reporting: This component requires that procedures be established for effective internal and external reporting and that an annual report be produced that is aimed at users of recycled water, regulatory authorities and stakeholders.

Section 10.2 of the RWM Manual covers reporting. Sydney Water provided evidence of a Compliance Reporting Procedure[265] that sets out a systematic approach for the Service Delivery Division to comply with legal and other reporting requirements and accountabilities. The procedure includes organising the correct personnel and collating the information for the regulatory reports required by IPART Reporting requirements for verification monitoring are detailed in the Section 13.2 Recycled Water Quality Monitoring Plan.

Quarterly reports are sent to NSW Health, Sydney Water provided evidence of the NSW Health annual (4th quarter) report.[266] Daily exception notifications are sent to relevant internal stakeholders via EKAMS[267] and LIMNOS actions database. An Annual Compliance and Performance Report[268] on Recycled Water Quality is prepared for IPART, and a copy made available to NSW Health. Irrigation and industrial recycled water customers are provided quarterly updates on recycled water quality for their schemes (depending on customer desired frequency).

The Liverpool RWQMP requires Liverpool Golf Club and Warwick Farm Racecourse to report via an annual formal statutory declaration is provided to Sydney Water at the end of each financial year and provide supporting information declaration demonstrating the effectiveness of the key risk management control measures identified in the RWQMP document and the customer agreement including irrigation flow usage pattern, water quality/soil monitoring data, summary exception reporting information, evidence of management review function and summary findings of any audits. As discussed in Element 1 and 5 this information is not being recorded in the appropriate system and the information provided to Sydney Water are not being reviewed for adequacy.

This element is considered full compliance for clauses 2.2.1 and adequate for 2.2.2 due to the issues associated with keeping records in the appropriate systems associated with the BCR role and insufficient review of the information provided with the Annual Declaration to identify that the information provided was insufficient.

11 Evaluation and Audit

Long-term evaluation of results: This component requires Sydney Water to collect and evaluate long-term data to assess performance and identify problems document and report the results.

Sydney Water routinely conducts long-term analysis of recycled water quality. Each quarter, statistical analyses of 12-month rolling window of data are performed. Findings and any associated actions are presented at each Joint Operational Group meeting. Quarterly reports on recycled water

[265] SDIMS0015 Compilation of Regulatory Reports for CD.docx
[266] 613231-Q4 RW Quality Monitoring Report for NSW Health 16-17.pdf
[267] Example of EKAMS exceedance 19-01-17.pdf
[268] Annual Recycled Water Quality Compliance and Performance Report 2016-17.pdf

quality[269] are prepared for NSW Health and subject to annual senior management review (see further discussion for element 12).

10 years of water quality results are evaluated and reviewed during the scheme risk assessment workshop. Scheme RWQMPs also record the long term (10 years) water quality analysis and findings for influent and effluent water quality.

Audit of recycled water quality management: This component required Sydney Water to establish processes for internal and external audits, document and communicate the audit results.

Sydney Water has established a process for internal audits.[270] The RWM Manual notes that external quality audits are carried out regularly by accredited auditors. We note there are auditors specifically qualified to audit recycled water quality management schemes although this qualification is not currently specified by Sydney Water for the audits of its recycled water scheme.

Audit related information is recorded in the BMIS Audit database. Audits are scheduled through the database and the reports resulting from the audits are also recorded in the same database. Audit outcomes are communicated to the auditees prior to raising actions. Audit actions are also raised in BMIS and completion of actions are managed through a workflow within the system (BMIS). The workflow process for undertaking and closing actions from the June 2016 internal audit was demonstrated during the on-site interview.

The June 2016 internal audit made the following findings:

> *"Audits and Inspections defined as a key control in mitigating End Use health and Environmental risks associated with watering or irrigation were not taking place routinely or thoroughly as defined in the case of Sydney Water BCS managed schemes*
>
> - *Surveillance varied from tick-and-flick inspections (least desirable) to a more detailed approach, the latter giving more confidence and better demonstrating corporate due diligence*
> - *Some of BCS customer audits/inspections had not been conducted within the 6-monthly frequency as defined.*
>
> *Customer Service Representatives were unsure as to the RWQMP section 10.2 requirement, in that supporting information demonstrating the effectiveness of the key risk management control measures identified in the OEMP and Customer Agreement, including irrigation flow usage pattern, water quality/soil monitoring data, management review details and summarised findings of any internal/external audits, was typically not furnished in support of annual statutory declaration provided to Sydney Water by scheme users such as industry, golf courses and Warwick Farm Racecourse"*

It is concerning that the above findings, made over 12 months ago were also observed in the current audit (as discussed in Elements 1, 5 ,7, 10).

This element is considered full compliance for clauses 2.2.1 and adequate for 2.2.2 as the findings for the compliance inspections and review of the information that should be provided in support of the Annual Declaration are not being appropriately undertaken, communicated and oversighted to demonstrate adequate management of public health and environment risks by the end users.

12 Review and Continuous Improvement

Review by senior managers: This component requires that senior managers review the effectiveness of the management system and evaluate the need for change.

[269] 613231-Q4 RW Quality Monitoring Report for NSW Health 16-17.pdf
[270] IMS Audit Plan - 2016 - 2017.xlsx

The Management Review Process[271] sets out the method and accountabilities for the annual Service Delivery Division management review and performance reviews. Section 12.1 of the RWM Manual notes further internal mechanisms for top management review of recycled water and the effectiveness of Sydney Water's Recycled Water Management System. The agenda for the Integrated Management System – Annual Management Review 2016 and a PowerPoint presentation[272] were provided as evidence of senior management review of the Recycled Water Management System. An internal assessment of maturity undertaken for the recycled water system was presented at the December meeting. It noted the area for greatest improvement was RWMS / AGWR training and items to progress this area. Evidence of the development of e-learning training was also provided at the meeting.

Recycled water quality management improvement plan: The component requires that Sydney Water develops a recycled water quality management improvement plan and ensures that the plan is communicated and implemented, and that improvements are monitored for effectiveness.

Sydney Water's recycled water quality improvements plan is made up of:

- BMIS0214-Product Management Improvement Framework[273]
- 548309- Product Management Improvement Register (specific recycled water actions listed)
- 528774 - Recycled Water Scheme Improvement Register

The Product Management Improvement Framework provides an overarching framework for all products. It documents the hierarchy from the Product Management Improvement Framework to the product improvement strategy which is a virtual collection of improvement actions.

Sydney Water uses a Product Improvement Register as the key instrument recording the outputs of the Product Improvement Framework. Sydney Water notes[274]:

> *"The register aligns to the management operating system (MOS) via the individual team work plans. The register is periodically reviewed and updated when new programs or improvement initiatives are identified, or are completed. This provides the flexibility needed to allow the planning process to adapt to changing situations and requirements."*

The product improvement register[275] contained two initiatives:

- RWQUAL1.0 4-year rolling update of Scheme RWQMPs / LRVs
- RWQual2.0 Initiate online UVT monitoring

There was little other information in the RW Quality Strategy tab. It did not appear this register was being actively used to track these initiatives. The auditor recognises these two actions had been previous recommendations and would have been tracked through the folio.

The Recycled Water Scheme Improvement Register[276] listed actions for each WRP and recorded the action number, the action, the source of the action, tentative responsibility tentative timeframe, update April – June 2017. The relationship between this register and the Product Improvement Framework or Product Improvement Register was not clear.

This element is considered fully compliant for clauses 2.2.1 and 2.2.2.

[271] SDIMS0012 Management Review.docx
[272] Annual management review 2015-16_v5.pptx
[273] BMIS0214 Product improvement framework.docx
[274] p5 BMIS0214 Product improvement framework.docx
[275] 548309 Product Management Improvement Register.xlsx
[276] 528774 - Recycled Water Scheme Improvement Register.pdf

Clause 2.3 – Fluoridation Code

Table B-11. Clause 2.3.1 compliance grade

Subclause	Requirement	Compliance grade
2.3.1	Sydney Water must comply with the Fluoridation Code.	Adequate compliance

Risk	Target for full compliance
Non-compliance with this sub-clause poses a risk that Sydney Water is not achieving best practice in the establishment and operation of its fluoridation plants, nor meeting the technical, occupational health and safety and environmental requirements of the relevant legislation.	Fluoridation systems and associated management structures that comply with all relevant aspects of the *NSW Code of practice for fluoridation of public water supplies 2011*.

Evidence sighted

- A0000101 Nepean Audit 2016 Report
- A0000103 Prospect Audit 2016 Report
- A0000103 Prospect Audit 2016 Report-action completed
- BI_Fluoride Result 2016-17 Treated Water and Networks
- BI_Fluoride Result 2016-17 Treated Water and Networks
- BMIS0209 – Technical specification, Part 2 – Mechanical works
- Cascade WFP-Form 5 Interruption to Fluoride dosing_01062016
- Cascade WFP-Form 5 Interruption to Fluoride dosing_15092016
- Cascade WFP-Form 5 interruption to Fluoride dosing_28072016
- Cascade WFP-Form 5 Recommence Fluoride dosing_20102016
- Clause 10.24(b) of a BOOT contract, viewed by auditor. Commercial restrictions prevented a copy of contract from being supplied as audit evidence.
- Email - FW Temporary stoppage of fluoride dosing at Warragamba WFP
- Email - FW Temporary stoppage of fluoride dosing at Warragamba WFP
- Email - RE: SWC Audit questions (9 November 2017
- HR-005A Training Attendance Register DWQEM 14 July 2016- Suez
- HR-P-005 PWFP Training Matrix Procedure
- HR-P-005A PWFP Training Matrix. Issue 4
- IMS0038 – Management of change procedure
- IMS0152.01_Drinking Water Product Specifications_v3
- IMS5396.02-DWQEMP Training Attendance-Nepean_OH_Warragamba
- Induction records
- Inspections at Nepean WTP and Prospect WTP
- Interviews with Suez staff
- Interviews with Sydney Water staff
- LAB-107 Fluoride
- Lab-107A Fluoride Equip Calibration Adjustment Record Sheet
- LAB-107B Fluoride Sample Worksheet
- MoU Health - http://www.sydneywater.com.au/web/groups/publicwebcontent/documents/document/zgrf/mdq3/~edisp/dd_047318.pdf
- N Richmond WFP-Form 5 Interruption of Fluoride Dosing 032017
- Nepean Daily Log Sheet

- Observations of SCADA
- OCS5002 – Fluoride Audit Procedure
- OHS-P-004B PWFP Authorisation Register Issue 8.
- Online Fluoride Analysers Trial_ Pres to NSW Health_May2017
- OP.611 FLUORIDE Ops manual
- OP.611 Operations Procedure Fluoride. Issue 7
- PC-02-Process Monitoring & Chemical Regimes. Issue 10
- PC-02-Process Monitoring & Chemical Regimes. Issue 10
- PC-05E Chemicals - Daily Check sheet
- PC-05F Chemical Weekly Inspection log
- Prospect WFP – Procedures used are as provided above
- SCADA screenshot_Fluoride fill.docx
- Scott Dowling_Fluoride Certificate
- Site inspection at Nepean WTP, including fluoride dosing system
- Site inspection at Prospect WTP, including fluoride dosing system
- The Process Decision & Abnormal Water Quality Work Instruction – Nepean WFP provided as above. Other local plant procedures on request
- Warragamba WFP - Form 5 Interruption to Dosing_23JUN2016
- Warragamba WFP - Form 5 Recommencement of Dosing_1NOV2016
- WPIMS5228 – Drinking water quality event management
- WPIMS5228-Drinking Water Quality Event Mgmt Plan Jul 17
- WTHQ5020_Training Requirements
- WTNE5006 Process and Equipment Monitoring Nepean
- WTNE5019 – Process decisions and abnormal water quality – Nepean WTP

Summary of reason for grade

There is sufficient evidence to confirm that the requirements have generally been met apart from a number of minor shortcomings which do not compromise the ability of the utility to achieve defined objectives or assure controlled processes, products or outcomes. These shortcomings include:

- Sydney Water's incident response procedures do not refer to, and are inconsistent with, the *NSW Code of practice for fluoridation of public water supplies 2011* and fluoride incident management protocols (Appendix C) (CoP 10.3.1.1)
- Failure to submit exception reports (written notification) in some circumstances requiring notification to NSW Health (CoP 11.1.3.1);
- Internal audits did not assess compliance with latest version of the Fluoridation Act, Regulation, and the whole of the Code of Practice (CoP 14.1.1.1);
- The following deviations from the NSW Code of practice for fluoridation of public water supplies 2011 was observed at Nepean WTP:
  - The maximum physical dosing capacity of the fluoridation chemical feeding equipment was observed to be not limited to 110% of the operating target dose rate (CoP 5.1.3.1)
  - The fluoride day tank was observed to be vented to a dry water trap (CoP 5.1.5.5)
  - Pipe markers were not observed on the temporary fluoride dosing pipework (CoP 5.2.5.1)
  - A minimum of 3 months storage of fluoride was not observed (CoP 8.2.1.1)
- The following deviations from the NSW Code of practice for fluoridation of public water supplies 2011 was observed at Prospect WTP:
  - Dust mask filters were observed that had not been changed within 13 weeks (CoP 6.1.1.1)

No evidence was observed which indicated that any of these shortcomings resulted in a risk to public health.

Discussion and notes

Chapters 1-3 of the *NSW Code of practice for fluoridation of public water supplies 2011* are administrative in nature. These chapters are not auditable as they do not contain required outcomes, minimum standards, or guide notes.

The relevant minimum standards were audited at Nepean WTP and Prospect WTP.

The following required outcomes were audited for the whole of Sydney Water:

- 4.2.1 Initial design risk control measures shall not be degraded through subsequent modifications of the fluoridation plant and/or the water supply system.
- 10.1.1 The fluoridation plant is operated to maintain a consistent fluoride concentration throughout the distribution system.
- 10.2.3 All operating staff at a fluoride plant follows the same procedures when carrying out routine operational duties.
- 10.3.1 Consumers should not receive fluoride concentrations over 1.5 mg/L. Any over or under dosing incidents are quickly identified and effectively managed to minimise any impact on consumers (Appendix C – Form 5 & 6)
- 11.1.3 Exception reports are provided to NSW Health in a timely manner.
- 14.1.1 The water utility complies with the requirements of the Fluoridation Act, Regulations, and the requirements of this Code of Practice on an on-going basis.

Chapter 4 Application and approval to fluoridate

Systematic and appropriate risk control measures are in place at Sydney Water's fluoridation facilities to minimise the potential for over and under dosing of fluoride. Sydney Water obtained approval from NSW Health prior to fluoridating. Instruments of approval to fluoridate were available at each site inspected.

Initial design risk control measures have not been degraded through modifications of the fluoridation plant and/or the water supply system. There were no modifications during the audit period that required Sydney Water to consult with NSW Health or submit a new Application to Fluoridate form (Form 1). Approval has been sought for historical modifications. Records of the modifications were maintained at the relevant WTPs, though it was reported by Sydney Water staff that approvals had been archived.

Relevant Sydney Water staff and BOOT contractors have an awareness of the key design risk control measures to prevent over and under dosing of fluoride. A current copy of the Instrument of Approval was available at each WTP. NSW Health is satisfied that, in the case of Sydney Water Corporation, the maintenance of an electronic Instrument of Approval meets the 'Outcome' required by the Code. Relevant staff had easy access to a copy of the NSW Code of practice for fluoridation of public water supplies 2011.

The Sydney Water consumers received water that was fluoridated to the optimal level so that oral health is not compromised. Sydney Water did not permanently cease fluoridating a water supply during the audit period.

Chapter 5.1 Design controls for fluoridation facilities – General design criteria

Sydney Water fluoridation plant consistently achieved an overall accuracy of within ± 5% of the required fluoride target dose rate. Water flowmeter(s) have been provided to measure and integrate the water flow, and to pace the fluoride dosing equipment.

The fluoridation plants have been designed to ensure reliable automatic operation, stopping and starting with the water flow being dosed. Two discreet physical indications of water flow are 'hard' wired in series at each plant inspected, either directly or via PLC (programmable logic controller) coding, in the control loop for starting and stopping of the fluoridation plant. At Nepean, the flow permissive meter was upstream of the dosing point and the flow pacing meter was downstream of the dosing point. At Prospect, both the flow permissive and the flow pacing meters were upstream

of the dosing point. It is likely to be impractical to locate a flow pacing meter downstream of the Prospect WTP fluoride dosing point, but it may be practical to locate a flow permissive meter downstream of the dosing point. All key components of the fluoride dosing system are electrically interlocked to ensure total fluoride dosing system shutdown on the failure of any individual equipment item. Solution water supply has a backflow prevention device fitted upstream of where the fluoridating agent is diluted (e.g. mixing tanks) or injected (e.g. dosing pumps).

The design of the fluoridation plants minimises the risk of overdosing due to human error. There is no maximum water flow rate specified in the Director-General's instrument of approval. As such, the dosing systems cannot be limited to 110% of the operating target dose rate at the maximum water flow rate approved by NSW Health. At Nepean WTP, the fluoride doing pump was set to 65% to dose at the normal set point. To meet the required outcome, the fluoride pump would need to be recalibrated so that a setting of 90% is required for normal dosing. There were no standard electrical outlets in the fluoridation rooms, and no fluoridation equipment had a standard electrical plug. Manual switches, where present, were spring loaded and returned to the off position when released to prevent unattended manual operation. Manual operation via PLC/SCADA control modes included a "hard" coded timer (i.e. not changeable by operators or maintainers) that will turn the fluoride pumps off. The timer was set to five minutes at Nepean WTP and seven minutes at Prospect WTP, though the manual dosing was limited to five minutes at Prospect WTP.

The design of the fluoridation plants provided plant operational staff with all that is required to measure and control the fluoridation process (and equipment) accurately and consistently in a timely manner, including the ability to measure the instantaneous water flow and the total amount of water treated and fluoridating agent used over a 24-hour period. The calculation of instantaneous and average 24 hour calculated doses does not have errors greater than ± 5%. All necessary local indications are provided to allow the operator to assess whether the process and equipment are running satisfactorily.

The design of the fluoridation plant generally provides a safe working environment and facilitate safe working practices to protect both plant operations staff and the public. At Nepean WTP, where hydrofluosilicic acid is used, electrical control cubicles for the fluoridation plant are located so as to minimise deterioration due to corrosion and to minimise the need for staff to enter the fluoridation plant room or specific areas where fluoridation equipment is installed. The installation (e.g. relative locations, mounting height and all-round access) of all equipment, valves, controls and access points facilitate easy access for all expected operational and maintenance requirements. At Prospect WTP, where a dry fluoridating agent is used, there is a dust extraction system to reduce escape of powder into the fluoridation room and to maintain an acceptable breathing atmosphere. The dust extraction equipment operates from the time the bags are opened to when the bags are unloaded into the storage hoppers.

At Prospect WTP, where a dry fluoridating agent is used, the design of the fluoridation plant room allows for build-up of powder from air deposition over time. At Nepean WTP, where hydrofluosilicic acid is used, the associated corrosive fumes are removed from the fluoridation plant room via mechanical ventilation. Fumes from the Nepean WTP day tank are vented into the fluoridation room through a water trap, though the water trap was dry at the time of the inspection. The fluoridation rooms are designed to allow easy cleaning and removal of spilt fluoridation chemical through hosing down of the lower walls and floor, though there was a build-up of spilt fluoride powder at Prospect WTP. At Prospect WTP, where a dry fluoridating agent is used, the design of the plant has minimised the need for any manual handling. Access to the fluoridation room or specific areas where the fluoridation equipment is installed is restricted to qualified WTP operators through provision of a security locking system. Appropriate signage has been provided to indicate the presence of the fluoridating agent, and that authorised entry only is permitted. Fluoride is not able to flow to lagoons where supernatant is returned to the head of the works.

The design of the fluoridation plants minimises the risk of fluoridating agents escaping to the environment. At Nepean WTP, where a liquid fluoridating agent is used, appropriate bunding is

provided to contain any spillage. The design of bunding facilitates the safe removal of any spillage. At Prospect WTP, where a dry fluoridating agent is used, powder is not allowed to escape from the fluoridation room to the external atmosphere. No adsorption trenches were installed at either site.

Chapter 5.2 Design controls for fluoridation facilities – Description and specific requirements for typical fluoride feed systems

The fluoridation system at Prospect WTP included a dry fluoride feed system into a fluoride solution feed system. The dry fluoride feed portion of the fluoridation system at Prospect WTP included a dust extractor system, a bag loader, a storage/feed hopper, a gravimetric dry feeder, a dissolving tank with mechanical stirrer, a weight loss system to monitor the weight of fluoridating agent used, a filtered dilution water source, and a positive displacement solution transfer pump. The storage hoppers had sufficient capacity for between 48 to 72 hours operation. The dry feeder, tank solution level, mixer, and transfer pump were electrically interlocked to ensure total fluoride dosing system shut down.

The fluoride solution feed portion of the fluoridation system at Prospect WTP included two batching tanks with mechanical mixers, a make-up water meter, a filtered make-up water source, fluoride solution flow meters in place of a graduated calibration tube, and dosing pumps. The solution tank and the metering pumps are electrically interlocked to ensure total system shut down when the tank is empty.

The hydrofluosilicic acid dosing system at Nepean WTP included a bulk storage tank, a day tank, weighing platform for the day tank, a graduated calibration tube, a metering pump with pressure relief diaphragm pressure gauge and a backpressure / anti-siphon valve on the delivery side of the pump. Transfer of hydrofluosilicic acid from bulk tank to day tank is initiated manually and stops automatically. The transfer is by pump, and incorporates a fail-safe motorised valve on the storage tank outlet and full storage measurement in the day tank. Interlocks are provided to automatically stop the transfer prior to overflow of the day tank. The day tank has approximately 36 hours' effective storage at maximum flow rate. Typical flow rates (20 ML/d) are 45% less than maximum flow rate (36 ML/d). An opportunity for improvement is to only store 36 hours of anticipated fluoride usage in the day tank. A diaphragm type pressure gauge followed by a back pressure /anti siphon valve is provided on the discharge side of the metering pumps. Flushing points before and after the metering pumps are provided to allow safe maintenance. The day tank is sealed and vented into the fluoridation plant building through a water trap that was dry at the time of the inspection.

Where pipework was painted, it was originally painted the colour Magenta P11 (AS 2700S), though some of the painted pipework had faded to pink. Self-adhesive pipe markers with the words sodium fluoride solution/ sodium silicofluoride solution/ hydrofluosilicic acid as appropriate and directional arrows were provided along some of the pipe, though not all pipework was painted or marked.

Chapter 6 Occupational Health and Safety

A safe working environment and safe working practices have generally been provided for both plant operators and untrained staff/public. The water utility must comply with the (NSW) Occupational Health and Safety Act 2000 and regulations made under it from time to time (the OH&S legislation). At Prospect WTP, the dust mask filters had not been changed for 25 weeks at the time of the inspections.

Chapter 7 Environmental Safety

The environment is protected from impact due to the fluoridation plant. The Sydney Water fluoridation systems comply with the *Protection of the Environment Operations Act 1997* (PEO Act) and other environmental protection legislation or regulations made from time to time.

Chapter 8 Control of fluoridating agent

The Sydney Water fluoridation plants did not run out of fluoridating agent during the audit period. Fluoridating agents are appropriately stored at the water treatment plants to minimise

deterioration. A minimum of 3 months storage of fluoridating agent was not maintained, though the supply risks were low, long-term procurement contracts were maintained, and the cost of storage infrastructure was significant. Dry fluoridating agents were stored in a secure dry environment.

Chapter 9 Measurement of fluoride in the treated water

A representative sample of treated water that directly reflects the real-time dosing performance of the fluoridation plant is available at all times in the testing rooms at the water treatment plants. The sampling point location is far enough downstream of the fluoride injection point to ensure the fluoride is well mixed, but prior to the clear water tank.

A reliable method for determining fluoride concentration in the treated water is provided at each water treatment plant. An appropriate bench area is provided in close proximity to the fluoridation plant to allow routine fluoride concentration analyses to be performed. The ion selective electrode method is used for determining the fluoride concentration in treated water. The methods conform to that described in the latest edition of Standard Methods for the Examination of Water and Wastewater. Each site had the following equipment and reagents to carry out analyses are:

- an ion selective meter that can be used for fluoride and temperature probes (Nepean = Orion Dual Star, Prospect = Radiometer Pacific PHM 240 pH/ION meter)
- fluoride selective electrodes
- temperature probe
- a magnetic stirrer
- laboratory plastic ware (beakers, measuring cylinders and sample/storage bottles)
- timer and thermometer
- reagents (total ionic strength adjuster and electrode filling solution) (Nepean = MISAB, Prospect = TISAB III)
- calibration standards (0.20 and 2.00 mg/L standard fluoride solutions)
- a quality control standard solution (1.00 mg/L).

The calibration standards are accurate and changed regularly. The quality of the total ionic strength adjuster and electrode filling solutions and the operation of the fluoride meter are reliable. Appropriate regular quality assurance checks and balances are in place to ensure the accuracy and reliability of fluoride measurements in the treated water.

All operating staff at a fluoride plant follow the same procedure when calibrating the fluoride meter and analysing fluoride samples, with standard operating procedures (SOPs) available on-site. The water utility developed, trained, and implemented SOPs for carrying out calibration of the fluoride meter, and for routinely determining the fluoride concentration in a treated water sample. All operators were competent in carrying out these SOPs.

The potential for incorrect fluoride results due to temperature differences between the calibration standards and the treated water samples is minimised. The analysis procedures ensure the fluoride calibration standard(s) and the treated water sample are at the same temperature before proceeding with the analysis. Standard solutions and samples were stored in a water bath at the same temperature as the water being tested prior to analysis.

Chapter 10 Plant operation and process control

The Sydney Water fluoridation plants are operated to maintain a consistent fluoride concentration throughout the distribution system. Sydney Water uses a fluoride operating target of 1.00 mg/L in treated water, as specified by the Director-General of Health in the Instrument of Approval. Over the 12-month audit period, greater than 95% of all routine fluoride samples (both treated water and distribution) were within the fluoride concentration operating range of 0.90 to 1.50 mg/L.

The Sydney Water fluoridation plants reliably achieved the required fluoride concentration in the treated water on a continuous basis with no over dosing and limited under dosing. The under dosing was associated with planned maintenance of the fluoridation systems. Sydney Water carried out daily plant inspections and checks to assess whether the process performance has been satisfactory,

and in particular whether any significant overdosing has occurred which would require emergency action to be taken. Sydney Water maintained a daily record of:

- the volume of water treated
- the quantity of fluoridating agent added over the same time period
- the corresponding average calculated fluoride dose
- the fluoride analysis result from the treated water sample taken during this time period
- the stock of fluoridating agent on hand.

Sydney Water ensured that the fluoridation plant and equipment was adequately maintained to achieve reliable operation.

All operating staff at each fluoride plant followed the same plant specific procedures when carrying out routine operational duties. Each Sydney Water operated plant had the same or similar procedures. BOOT contractors developed and implemented their own procedures. Fluoridation procedures were common or similar at WTPs operated by the same BOOT contractor, but different between WTPs operated by different BOOT contractors, and different from Sydney Water's procedures. All operators were competent in carrying out these SOPs.

Only qualified operators operated the fluoridation plant and equipment. Access to the fluoridation plant and equipment was controlled to minimise the risk of over or under dosing of fluoride into the treated water from incorrect operation of the fluoridation equipment, or damage to the facility, from unauthorised persons. The water utility had a sufficient number of qualified people (at least two) available to enable operation of the fluoridation plant at all times.

Consumers did not receive fluoride concentrations over 1.5 mg/L during the audit period. All under dosing incidents were associate with planned maintenance, and effectively managed to minimise any impact on consumers. Form 5s were submitted to notify NSW Health of the planned maintenance. The shutdown period at Cascade WTP exceeded the period notified in advance.

Sydney Water has fluoride emergency response plans[277, 278] that form part of the water utility's overall emergency management strategy and plans (CoP minimum standard 10.3.1.1). However, it was not demonstrated that these plans were consistent with the requirements of Appendix C of the NSW Code of practice for fluoridation of public water supplies 2011, including notification to NSW Health and consultation with DPI Water (CoP required outcome 10.3.1).

Sydney Water provided WTNE5019 Process decision and abnormal water quality – Nepean WTP278 as evidence of emergency response plans for fluoride overdosing events at Nepean WTP. Other water treatment plants have similar emergency response plans. WTNE5019278 is adequate for management of overdosing events that occur at Nepean WTP, which do not require notification to NSW Health and consultation with DPI Water. It was not demonstrated that WTNE5019278 described the notification and consultation process required for fluoride overdosing incidents that were detected in the reticulation network.

Sydney Water provided WPIMS5228 Drinking water quality event management277 as evidence of emergency response plans for fluoride overdosing at any water treatment plant and any reticulation network. It was not demonstrated that WPIMS5228277 is consistent with the process described in Appendix C of the NSW Code of practice for fluoridation of public water supplies 2011 including notification to NSW Health and consultation with DPI Water. The process described in WPIMS5228 involves consulting responsible officers listed in Appendix 1 and 2, and managing the event in accordance with procedures and protocols.

Appendix 1 of WPIMS5228 relates to water quality events and incidents at treatment plants. It was demonstrated to be adequate for management of fluoride overdosing events that are contained

[277] WPIMS5228 Drinking water quality event management
[278] WTNE5019 Process decision and abnormal water quality – Nepean WTP

within the boundary of a water treatment plant, where notification to NSW Health and consultation with DPI Water are not required.

Appendix 2 of WPIMS5228 relates to water quality events and incidents in the reticulation networks. It requires Networks to notify Treatment Operations of fluoride overdosing incidents that are detected in the reticulation network, with Treatment Operations to declare an incident and manage the response. While section 6 of WPIMS5228 directs the incident controller to verbally notify NSW Health, it was not demonstrated that it contains all the elements of the NSW code of practice for fluoridation of public water supplies 2011 Form 6 – Fluoride overdose response plan, specifically:

- immediate cessation of fluoridation
- consultation with DPI Water
- time intervals for retesting
- requirements for written reports (Form 5) to NSW Health.

Chapter 11 Reporting requirements

Exception reports were generally provided to NSW Health in a timely manner. Sydney Water advised NSW Health Water Unit in advance of failure to fluoridate for a period greater than 24 hours associated with planned maintenance. There was one example of failure to fluoridate associated with planned maintenance exceeding the notified period.

The notification included details of the incident: extent, times, water volume affected etc. Most notification were on Form 5, with one notification via email.

Chapter 12 Operator training and qualification

All fluoridation plant operators were competent to operate a fluoridation plant, holding a Fluoride Plant Operator's Certificate issued by NSW Health. Sydney Water and the BOOT contractors provided on the job training under the direct supervision of a qualified and competent operator in how to operate the fluoridation plant.

Chapter 13 Record keeping and availability

Records documenting the fluoridation plant performance were maintained. Form 5s for the audit period were available for inspection. Records of historical changes and approvals were reportedly archived off-site.

Chapter 14 Quality assurance and auditing

Sydney Water carried out and documented audits on each of its fluoridation plants either prior to or during the audit period. The audits assessed compliance of the fluoridation plants with Chapters 4-14 of the latest version of the Code of Practice, excluding large sections of Chapter 5. Chapters 1-3 are not auditable. The audits did not assess compliance of the system as a whole (i.e. did not address reticulation issues), and did not directly assess compliance with the latest version of the Fluoridation Act, Regulation, or most of Chapter 5 of the Code of Practice.

Recommendations

Recommendation 2.3-1: By 30th June 2018, ensure all fluoridation systems are designed, installed, and operated in accordance with the *NSW Code of practice for fluoridation of public water supplies 2011* (unless an exemption has been received from NSW Health), with particular reference to:

- ensuring the dosing capacity of the fluoride dosing equipment does not exceed 110% of the target dose rate
- ensuring water traps remain filled
- providing appropriate colour coding and marking of dosing pipes
- replacing dust mask filters every 13 weeks
- maintaining a minimum of 3 months storage of fluoridating agent or apply for an exemption from this minimum standard 8.2.1.1 from NSW Health.

- ensuring emergency response plans are consistent with *Appendix C* of the *NSW Code of practice for fluoridation of public water supplies 2011*
- submitting written notifications to cover all periods of repair/maintenance
- ensure internal audits assess compliance with all relevant requirements of Chapter 5 of the *NSW Code of practice for fluoridation of public water supplies 2011*

Opportunities for improvement

OF2.3-1: Ensure transfers to the fluoride day tank only provide 36 hrs of anticipated fluoride usage in total.

Clause 3.1 – Roles and Responsibilities Protocol

Table B-12. Clause 3.1.1 compliance grade

Subclause	Requirement	Compliance grade
3.1.1	Sydney Water must use its best endeavours to: 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).	Full compliance

Risk	Target for full compliance
The roles and responsibilities protocol will outline the roles of each party in metropolitan water planning. There are moderate operational risks in not having a documented protocol for liaison, implementation and data sharing.	A Roles and Responsibilities Protocol with the Metropolitan Water Directorate for the development and implementation of the Metropolitan Water Plan. Evidence that the Roles and Responsibilities Protocol is being complied with.

Evidence sighted

- Roles and responsibilities protocol with Metro Water Directorate_Folio 2016-17 .pdf
- File note RandRP review.docx
- PD for Policy Analyst.docm
- Roles+Resp Protocol draft final.docx
- Letter from Planning and Environment 18/8/2017
- E-mail between Sydney Water and MWD (3/2/2017)

Summary of reason for grade

Both Sydney Water and Metropolitan Water Directorate provided evidence supporting that best endeavours were being used to progress the development of the Roles and Responsibilities Protocol with the Metropolitan Water Directorate for the development and implementation of the Metropolitan Water Plan. Although the Protocol has not yet been signed, evidence through e-mail trails and resourcing was provided that Sydney Water and Metropolitan Water Directorate currently have a positive and co-operative working relationship and are progressing the development and implementation of the Metropolitan Water Plan and associated projects.

Discussion and notes

Metropolitan Water Directorate (MWD) advised:

> *"MWD is of the belief that Sydney Water has generally used its best endeavours to develop and agree to a Roles and Responsibilities Protocol between the two agencies. Sydney Water has been responsive to correspondence and met with MWD staff several times to talk through the matters covered by the Roles and Responsibilities Protocol in an attempt to reach agreement. Staffing changes for both agencies hindered the finalising of the agreement in late 2015 and negotiations were re-established in late 2016 and have recently concluded, with the protocol currently being considered for approval by the Secretary of DPE and Managing Director of Sydney Water.*
>
> *Both agencies have taken seriously the commitments being made through the Roles and Responsibilities Protocol and as such, both parties have sought several rounds of legal comment on the document. This has naturally prolonged the process of reaching agreement."*

A file note was provided that documented a number of interactions with MWD from September 2016 and extending beyond the audit period. An e-mail trail between Sydney Water and MWD documented:

> *"Sydney Water has developed a draft protocol, in consultation with Metropolitan Water Directorate (MWD). Each party has finished a preliminary legal review of the draft document.*
>
> *Metropolitan Water Directorate have requested the protocol not be finalised until the Metropolitan Water Plan is published, and the associated Monitoring, Evaluation, Reporting and Implementation (MERI) plan is drafted. This is to ensure the requirements on each party in the protocol are consistent with MERI Plan.*
>
> *MWD have informed Sydney Water that they plan to have the MERI and the roles and responsibilities protocol completed by the end of June 2017.*
>
> *While the Roles and Responsibilities protocol remains a draft document, Sydney Water and Metropolitan Water Directorate currently have a positive and co-operative working relationship and are progressing the development and implementation of the Metropolitan Water Plan and associated projects."*

While outside the audit period, Sydney Water noted the draft protocol has been sent to MWD for approval on 14th July 2017.

Sydney Water has employed a policy analyst. The technical accountabilities for this role[279] are:

- Analyse requests and information received from the Metropolitan Water Directorate (and its forums including Metropolitan Water CEOs. EFRHOG, Senior Officers' Group and DMAG) and coordinate the development of Sydney Water responses.
- Review agendas, minutes and actions arising from Metro Water Planning forum meetings.
- Represent Sydney Water at relevant Metro Water planning forums as required.
- Advise senior management and Executive on emerging issues arising from long-term supply-demand planning that may impact Sydney Water's business, and make recommendations as necessary.
- Coordinate Sydney Water's inputs into the review of the Metropolitan Water Plan, Water Sharing Plan and other related plans.
- Maintain a strong network of internal and external experts and stakeholders in the area of water management policy.
- Support the Manager Research and Governance and Value and Manager Corporate Strategy in ensuring sufficient time and resources are made available to support Metropolitan Water planning requirements.

Sydney Water tracks compliance with this licence sub-close through its folio.[280] The folio noted:

> *"While the Roles and Responsibilities protocol remains a draft document, Sydney Water and Metropolitan Water Directorate currently have a positive and co-operative working relationship. The Metropolitan Water Plan has been released and Sydney Water and MWD are working collaboratively on implementation."*

Recommendations

There are no recommendations for this sub-clause.

Opportunities for improvement

There are no opportunities for improvement for this sub-clause.

[279] PD for Policy Analyst.docm
[280] Roles and responsibilities protocol with Metro Water Directorate_Folio 2016-17 .pdf

Clause 3.2 Economic level of water conservation

Table B-13. Clause 3.2.1 compliance grade

Subclause	Requirement	Compliance grade
3.2.1	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.	Full compliance

Risk	Target for full compliance
This risk posed by this clause is that Sydney Water would not have a consistent approach for determine appropriate investments in water conservation activities. This is a low to medium economic and operational risk that water conservation investment is efficiently directed.	A methodology for determining its economic level of water conservation, including (at a minimum) each of the following elements of water conservation: a) water leakage; b) water recycling; and c) water efficiency (including demand management)

Evidence sighted

- 614475 – IPART approval of ELWC principles.pdf
- Stage 1 ELWC Report.pdf
- 581627 – ELWC methodology.docx
- 581629 - IPART letter ELWC approval.pdf

Summary of reason for grade

Sydney Water has developed a methodology for determining Sydney Water's economic level of water conservation titled *Determining Sydney Water's Economic Level of Water Conservation Part A The ELWC methodology*. IPART has indicated its satisfaction that the methodology meets the licence requirements and is consistent with the approach and principles approved by IPART.

The subclause is assessed as fully compliant.

Discussion and notes

This subclause requires Sydney Water to develop a methodology in accordance with the report previously submitted to IPART[281] outlining Sydney Water's approach and principles for determining its economic level of water conservation, including (at a minimum) each of the following elements of water conservation:

a) water leakage
b) water recycling
c) water efficiency (including demand management).

Sydney Water has developed the ELWC methodology on a marginal value framework. The methodology considers the cost of investment in water conservation until the cost of saving an extra volume of water is just equal to the cost of supplying an extra volume of water. The value of water varies with time and current water storage levels. Social and environmental costs and benefits are included if monetary valuations are available

The ELWC represents an estimate of the amount of water that could be conserved each year, based on an economic assessment of costs and benefits across individual water conservation projects. The ELWC methodology is required to be capable of assessing costs for the following types of water conservation activities:

- water leakage
- water recycling

[281] Stage 1 ELWC Report.pdf

- water efficiency (including demand management).

The ELWC methodology aggregates the estimated water savings from economically viable projects for the above three water conservation activities.

Sydney Water has been assessed as fully compliant with this sub clause.

Recommendations

There are no recommendations for this clause

Opportunities for improvement

There were no opportunities for improvement identified for this clause

Table B-14. Clause 3.2.3 compliance grade

Subclause	Requirement	Compliance grade
3.2.3	By 31 December 2016, Sydney Water must obtain IPART's approval for the Methodology.	Full compliance
Risk		**Target for full compliance**
The risk associated with methodology development was considered above. There is a compliance risk associated in not obtaining the approval itself and an extension of the risk noted for clause 3.2.1 if the Methodology development is delayed.		Evidence of IPART's approval for the ELWC methodology

Evidence sighted

- 581629 - IPART letter ELWC approval.pdf
- Additional Evidence – Water Quantity; Roles and Responsibilities Protocol
- 581627 – ELWC methodology.docx

Summary of reason for grade

IPART issued a letter of approval for Sydney Water's ELWC Methodology outlined in *Determining Sydney Water's Economic Level of Water Conservation Part A The ELWC methodology* on the 21st December 2016.

Discussion and notes

IPART issued a letter of approval for Sydney Water's ELWC Methodology outlined in *Determining Sydney Water's Economic Level of Water Conservation: Part A The ELWC methodology* on the 21st December 2016.

The letter stated:

> *"We are satisfied the methodology meets the licence requirements and is consistent with the approach and principles approved by IPART."*

Recommendations

There are no recommendations for this sub-clause.

Opportunities for improvement

There are no opportunities for improvement for this sub-clause.

Table B-15. Clause 3.2.5 compliance grade

Subclause	Requirement	Compliance grade
3.2.5	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: 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.	Full compliance

Risk	Target for full compliance
Non-compliance with the requirement of this sub-clause has the potential to pose a high risk. Failure to manage the Water Usage Level and Water Leakage Level may have significant impacts both operationally and financially.	Evidence that Sydney Water: • maintained the Water Usage Level at less than 329 litres per person per day; • ensured that the Water Leakage Level did not exceed 121 megalitres per day; and • promote, foster and encourage the efficient use of water and the production and use of Recycled Water during the audit period.

Evidence sighted

- https://www.sydneywater.com.au/SW/education/drinking-water/Water-use-conservation/index.htm
- Daily Water Tracking v12.0 User Manual - Final.pdf
- AMQ0059- Calculation and Reporting - Corporate Waterbalance From Storages.doc
- Climate Corrected Demand Model_current_20170707.xlsm
- CS0001 - Procedure - Updating weather correction model.docx
- Output from the weather correction model updated to 30 June 2017.xlsx
- Water Conservation Report 2016-17 page 72.pdf
- Waterbalance model updated to 2016-17.xls
- http://www.sydneywater.com.au/SW/your-business/managing-your-water-use/programs-and-resources/index.htm

Summary of reason for grade

Sydney Water demonstrated that during 2016/17, it had:

- achieved a Water Usage Level of 302 L/d (less than the 329 L/d per day limit);
- achieved a Water Leakage Level of 114 ML/d (less than the 121 ML/d limit);
- continued to promote, foster and encourage the efficient use of water through programs such as PlumbAssist, WaterFix Residential and WaterFix Strats; and
- continued to promote the production and use of recycled water, reporting 38.4 ML/year or water recycled with an associated water saving of 9.7 ML/d.

Sydney Water has been assessed as fully compliant with this sub clause.

Discussion and notes

Water Usage Level

Water usage level is calculated using the weather climate correction model. This model is used to estimate the impact of actual weather conditions on demand in any one year relative to the baseline, considering variable including such as rainfall and evaporation. Sydney Water is required to maintain this weather corrected water usage below 329 L/person/d.

The User Manual[282] details how the model works and Sydney Water has a supporting procedure[283] for sourcing and entering the required data. During the audit interview the procedure for updating the model, the data sources and the quality assurance processes were discussed. Data is sourced from Bureau of Meteorology and WaterNSW. Water volume data is sourced from Sydney Water's Hydraulic System Services section.

The auditor was satisfied with the procedure and quality assurance associated with the data verification.

Water Leakage Level

Sydney Water determines the Water Leakage Level based on a Waterbalance calculation[284] that complies with the International Water Association framework model. The Water Balance Procedure[285] detailed the data sources, data verification and QA processes as well as the procedure for undertaking the water balance. The Water Balance spreadsheet[286] was verified as calculating 114.2 ML/d in line with the figure of 114 ML/d reported to IPART.

Water Conservation

Sydney Water continues to undertake a range of activities to promote, foster and encourage the efficient use of water and the production and use of Recycled Water (where financially viable). The Water Conservation report documents these activities including water efficiency projects:

- WaterFix residential
- WaterFix strata
- Plumb Assist
- Publishing information to assist business to be water efficient[287]
- Publishing information on recycling and reuse schemes[288]

Recommendations

This are no recommendations for this clause

Opportunities for improvement

The auditor noted in the information provided about recycled water information related to the Hoxton Park Water Recycling Scheme[289] stated:

> *"We'll contact customers with an update on the scheme by the end of 2015".*

OFI 3.2-1: There is an opportunity for improvement to review information provided to customers through its web-site to ensure the information is current.

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[282] Daily Water Tracking v12.0 User Manual - Final.pdf
[283] CS0001 - Procedure - Updating weather correction model.docx
[284] Waterbalance model updated to 2016-17.xls
[285] AMQ0059- Calculation and Reporting - Corporate Waterbalance From Storages.doc
[286] Waterbalance model updated to 2016-17.xls
[287] http://www.sydneywater.com.au/SW/your-business/managing-your-water-use/programs-and-resources/index.htm
[288] http://www.sydneywater.com.au/SW/water-the-environment/what-we-re-doing/recycling-and-reuse/using-recycled-water/index.htm
[289] http://www.sydneywater.com.au/SW/water-the-environment/what-we-re-doing/recycling-and-reuse/using-recycled-water/index.htm acd 25/9/2017

Clause 4.1 Asset Management System

Table B-16. Clause 4.1.1 compliance grade

Subclause	Requirement	Compliance grade
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). (Verbal update only)	Full compliance

Risk	Target for full compliance
Assets are poorly managed leading to higher costs and failure to meet required service levels.	Provision of a verbal update on progress to demonstrate that implementation of the Management System for Asset Management is in line with the required timeframe.

Evidence sighted

- Asset Management System_Folio of Progress 2016-17.pdf
- Asset Management Policy AMQ0033.pdf
- 60446910-RP-SAM-00X_1_Participant Report_Sydney Water.pdf
- LCS business plan.pdf
- State of Asset Report 2017.pdf
- Strategic Asset Management Framework - Final 17Sept15 PDF signed.pdf

Summary of reason for grade

At our audit, Sydney Water provided a verbal update on its progress implementing the Management System for Asset Management, as required.

Discussion and notes

At our audit, Sydney Water provided a verbal update on its progress implementing the Management System for Asset Management. It detailed how the Asset Management System is being implemented as part of an overall corporate management system. Sydney Water stated that it considers that it has the appropriate governance in place for the system and is now focusing on the business processes that are a major part of the system. Sydney Water has adopted the Global Forum on Maintenance and Asset Management's Landscape to guide the development of its system. This Landscape identifies 39 elements that comprise good asset management practice. Sydney Water intends to have its system addressing all 39 elements by June 2018. A gap analysis of Sydney Water's Asset Management System was conducted in May 2017. This audit identified seven major non-conformances as well as some minor non-conformances and improvement opportunities. Sydney Water stated that it considered that it has sufficient time and resources to address the non-conformances identified to meet the timing required by its licence for implementation of the asset management system (30 June 2018) and certification of the system (30 June 2019).

Recommendations

There are no recommendations in relation to this sub-clause.

Opportunities for improvement

There are no opportunities for improvement in relation to this sub-clause.

Table B-17. Clause 4.1.5 compliance grade

Subclause	Requirement	Compliance grade
4.1.5	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: 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.	Full compliance

Risk	Target for full compliance
Assets are poorly managed leading to higher costs and failure to meet required service levels.	An effective asset management system is in place and implemented across all asset classes and maintained or changed in a way that supports clause 4.1.1.

Evidence sighted

- Control and Monitoring Systems 2015-2020 AMP Final Version signed.pdf
- Reservoir 2015-2020 AMP Final Version signed.pdf
- Sewer Main 2015-2020 AMP Final Version signed.pdf
- SPS 2015-2020 AMP Final version signed.pdf
- Watermains 2015-2020 AMP Final Version signed.pdf
- WFP 2015-2020 AMP Final Version signed.pdf
- WPS 2015-2020 AMP Final Version signed.pdf
- WWTP 2015-2020 AMP Final Version signed.pdf
- AMQ0015-Avoid Fail.pdf
- AMQ0035 - CWM.pdf
- AMQ0100- Retic.pdf
- AMQ0116-Facility.pdf
- AMQ0136-Above Ground.pd
- AMQ0139-Dry Weather.pdf
- AMQ0552-Reservoir.pdf
- 60446910-RP-SAM-00X_1_Participant Report_Sydney Water.pdf
- Asset Management Policy AMQ0033.pdf
- Asset Management System_Folio of Progress 2016-17.pdf
- LCS business plan.pdf
- QMAF0080.docx
- State of Asset Report 2017.pdf
- Strategic Asset Management Framework - Final 17Sept15 PDF signed.pdf

Summary of reason for grade

Sydney Water has demonstrated that it continues to maintain and implement a robust asset management framework and that the changes it is making are consistent with its move to an asset management system compliant with ISO55001:2014.

Discussion and notes

This clause requires that Sydney Water maintain an effective asset management framework while it implements an asset management system consistent with the requirements of ISO55001:2014 and that the system is consistent with that in place under the preceding licence. To test this clause, we undertook a number of complementary audit activities, namely:

(1) Review of the asset management framework documentation

(2) Review of a sample of important asset management planning and decision making documents. Specifically, these were:

   (i) Three asset management plans: wastewater pump stations, water filtration plants and water mains

   (ii) Three decision making frameworks: aboveground pipelines (136), dry weather overflows (139) and water service reservoirs (552)

(3) Visit to a number of operational sites.

Asset management framework documentation

Sydney Water has in place an asset management policy that was approved in October 2009. We queried Sydney Water over the currency of this policy and were informed that an updated policy will likely be approved in late 2017 (i.e. outside of the audit period). It is appropriate that Sydney Water has updated the policy given the imminent move to an ISO55001:2014 based management system and this aligns with the licence requirement to change the framework where it is consistent with the ISO55001:2014 system.

Decision making frameworks

The above ground pipelines asset management plan covers a relatively small proportion of Sydney Water's asset base by replacement value but the assets are unique for pipelines in being exposed to the environment and being relatively accessible. Sydney Water explained that it has identified that the weakest element of the pipelines are the supports and therefore inspection programs prioritise these elements. Pipe wall thickness is also measured and for some pipelines finite element analysis has been undertake to confirm that the wall thickness is sufficient to provide the required strength. Sydney Water demonstrated a sound understanding of the lifecycle management of above ground assets at our audit and through review of the documentation provided.

Sydney Water's water service reservoirs are predominantly constructed of steel. Condition assessment across the entire base is carried out over a rolling three-year program and recorded in a dedicated database, ASAM. Sydney Water intends to transfer the function of this database to its computerised maintenance management system, Maximo. Sydney Water has identified that common modes of failure for reservoirs include small holes and structural issues with roofs. Sydney Water has identified that a future peak in renewals expenditure is required to replace reservoir roofs at the end of their useful life. We inspected a recently replaced roof at our site visit and discuss this further below.

Management of dry weather overflows have been subject to a long-term strategy and research program that commenced in 2005. Through this strategy, Sydney Water has developed a robust understanding of the causes, preventions and lifecycle interventions (maintenance and renewal) to mitigate dry weather overflows and sustain its sewerage network. Sewers are managed as either critical (avoid fail) or non-critical (which are allowed to fail). The avoid fail sewers are inspected in a program that covers the entire asset base over ten years. Sydney Water has analysed failure data and found that 86% of failures are due to tree root intrusion. Work is ongoing to understand that behaviour of tree roots and the types of trees that may be more likely to damage sewers. We queried Sydney Water whether its asset management strategy meant choosing between intact sewers or vibrant trees. Sydney Water responded that it has investigated the value of trees to the community and that it is likely to be more beneficial to the community to reline a sewer than

remove a tree and hence typically the tree prevails over the sewer. This demonstrates maturity in Sydney Water's asset management decision making in this area.

Sydney Water advised that there has been an approximately 25% reduction in dry weather overflows (five-year rolling average) since the strategy commenced. Sydney Water is also conducting customer research to better understand the customer experience of sewage overflows and has gained useful insights, such as the importance of the response and the information provided to customers. Sydney Water's approach to understanding and managing dry weather overflows is industry leading.

Asset management plans

Sydney Water is redefining its asset management plans (asset master plans) as it moves to the new asset management system. It desires that the plans become a collection of business process linked to different artefacts with data linked to live systems. This is understandable – asset management plans that are static and only produced for compliance (internal or external) are of little value in managing assets effectively as the plan becomes primarily a reflection of a specific point of time that is out of date the minute it is published. This is reinvigorated approach is consistent with the requirements of ISO 55001:2014, the focus of which with respect to asset management plans is demonstrating alignment with asset management objectives and describing the activities the business will undertake.

Sydney Water advised that an important element of its asset management plans is an annual risk and opportunity assessment to make clear the link between asset risk, service delivery risk and the asset management activities planned. Sydney Water stated that while it has applied risk based decision making to its asset management practices for a long period, it has formalised this approach for active assets in the reporting year through the introduction of an asset risk assessment tool linked to a four year capital expenditure forecast. The tool involves assigning a condition and criticality (consequence of failure) to each item of maintainable equipment at Sydney Water's treatment plants. This approach will be rolled out to wastewater pumping stations soon. We comment further on the application of this tool below in our discussion of our site visits.

We queried Sydney Water as to the benefits in this approach to asset risk management. Sydney Water responded that this approach promotes consistency and objectivity in decision making.

Recommendations

There are no recommendations in relation to this sub-clause.

Opportunities for improvement

There are no opportunities for improvement in relation to this sub-clause.

Clause 4.2 – System performance standards

Table B-18. Clause 4.2.1 compliance grade

Subclause	Requirement	Compliance grade
4.2.1	Water Pressure Standard 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: 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: 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: 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	Full compliance

Risk	Target for full compliance
Failure to deliver water continuously at the required pressure negatively impacts the ability of customers to use water.	To achieve full compliance, Sydney Water needs to demonstrate that it has met the minimum standard for water pressure as set out in its Operating Licence for the audit period 2016/17.

Evidence sighted

- Water Networks reports for 4.2.1, 4.2.2, I1, I2, I3, I5, A8, containing schedule of water pressure incidents and an example of monthly report
- DOC0333 - Investigation & Reporting Water Pressure Failure
- DOC0333.01 v2 - Analysis of Water Pressure Failure Data in Table 2
- DOC0333.02 - HYDRA Water Pressure Customer Rebate Process
- DOC0333.03 Water Pressure Customer Complaint Management Process
- DOC0333.04 Compiling Water Pressure Failure Data in Table 2.
- IICATS - Unplanned Interruption Report
- 464903 - Water Pressure Standard - PI Sheet
- Pressure Gauge Details (Table 1)
- Maximo - 2016-17 Low Water Pressure Analysis Summary

- Pressure Report 2016-2017 (table 2)

Summary of reason for grade

Sydney Water has provided sufficient evidence that the water pressure standard in its Operating Licence has been met during the audit period.

Discussion and notes

It was noted by Sydney water that for the 2016/2017 reporting period there were no major large-scale network failures, and that the majority of detected and reported low pressure events were from recurrent sites.

Sydney Water primarily assess its compliance with the water pressure standard through monitoring data collected by its network of around 624 pressure loggers spread across 435 zones that is captured through Sydney Water's telemetry system, IICATS. There are also 28 zones where no permanent pressure logger is in place and so Sydney Water installs a temporary pressure gauge that is manually logged in summer (when demand should be highest and pressure lowest). Currently 38 such temporary gauges have been installed.[290] It was noted by Sydney Water that with the development of the "Internet of Things", there is the potential to cost effectively increase the level of pressure monitoring within their network, as the cost for next generation wireless pressure monitors are approximately an order of magnitude less than conventional pressure monitors.

A secondary check is to investigate customer complaints relating to water pressure. Customer complaints relating to low pressure are managed through the Water Pressure Customer Complaint Management process (DOC0333.03). This customer complaint process is managed by the same Sydney Water representative from start to finish. The original pressure management process was reviewed in order to further streamline the process and therefore a new electronic form (WR8) has been developed to manage this process and the interface among Sydney Water teams. Water pressure complaints related work orders are created in Maximo with relevant task code and times of water on/off.

Currently, Sydney Water does not regularly use modelling to determine water pressure failures. Rather, data from its pressure loggers is recorded in IICATS, and low pressure alarms are generated when the pressure is lower than the desired set-point for more than 15 minutes. For extreme low pressure events, the automatically generated alarms are sent to field service teams for immediate investigation. For less severe events, a monthly report is generated by the Business Intelligence system that shows pressure reading relating to low pressure alarms from the previous month. The elevation difference between the pressure logger and the 'most (pressure) disadvantaged' property in the network is known and used to calculate the pressure at this most disadvantaged property in the network. It was clear to the audit team that Sydney Water has a thorough understanding of the network configuration and topography, and areas with known issues that require additional temporary gauging to ensure that they are meeting their supply pressure requirements.

This monthly report of low pressure events is reviewed by Sydney Water's Network Teams to determine the circumstances of the event and the reporting requirements. The Network Teams identify if there was any equipment failure (e.g. battery failure on the logger) or events in the network that led to the observed reading. Cross analysis with events recorded in Maximo is used to determine if maintenance/network activities have impacted on the reported low pressure. The observations of the Network Team are recorded in consecutive columns in the reporting spreadsheet. The work order number for network events are recorded and a short description of the event provided. The reviewer's name and date of the analysis are also recorded in the spreadsheet.

With regards to the use of modelling to identify properties affected by low pressure events, Sydney Water currently only uses modelling for major incidents and complex failures, due to the length of time required to set up and run the current network model. Looking to the future, Sydney Water is

[290]Detailed in Pressure Gauge Details (Table 1)

in the process of establishing a trial of a new network model that is linked to the network data to model low pressure events in real time. This trial was planned to commence to start earlier in 2017, but has been delayed. Successful implementation of this new model will allow Sydney Water to identify customer impact during the course of a major network event, as opposed to the current model and systems that can take up to 7 days from time of incident to determine customer impact.

During the audit, time was spent reviewing an example from Maximo of a repeated customer complaint for low pressure, SR# 1-AH04BM, with the customer citing that they were unable to use their shower due to lack of the water pressure. Initial investigation of network data by Sydney Water found that there was no recorded low pressure in that supply zone, nor were there any recorded network events or maintenance activities. A temporary pressure monitor was installed at the connection point to the customer's premises that also found that the supply pressure was not dropping below the contractual supply specification (15 m head). However, review of the elevation of the customer's house relative to the connection point identified that pressure within the household would be significantly affected to the point of no flow in the second storey, if the network supply pressure was close to the minimum supply pressure. As the customer was responsible for caring for a disabled relative, Sydney Water installed booster pumps to the customer's property to assist in ensuring adequate supply pressure within the dwelling.

Another example, SR# 1-JJDH6Q was reviewed by the audit team, which was for reported low pressure events reported at a property in Helensburgh. Review of the investigation for this low pressure complaint found that it was not possible for Sydney Water to accurately determine the supply pressure at the customer's residence, as it is located on an unmonitored section of the network. However, the Network Technician had identified that there was a faulty pressure regulating valve on a branch from this network that is believed to have been the cause of the reported low pressure event. Repairs for this faulty valve have been scheduled, and as no further customer complaints for this address have been recorded, temporary monitoring has not been installed.

Further time during audit was spent reviewing live data for a number of gauges. One of these gauges, WG2513, was reviewed and it was noted that there was a low pressure event within the past week, however, the investigation for this event had not been completed at the time of audit.

Finally, the auditors reviewed how Sydney Water calculates its reported figure based on the raw data and analysis of this data and consider that the calculation is performed correctly and that the data analysis supporting the reported figure is sufficiently robust.

Recommendations

There are no recommendations in relation to this sub-clause.

Opportunities for improvement

No opportunities for improvement have been identified in relation to this sub-clause.

Table B-19. Clause 4.2.2 compliance grade

Subclause	Requirement	Compliance grade
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; and 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). 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	Full compliance

Interruption and the duration of the Unplanned Water Interruption.

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).

d) For the purpose of the Water Continuity Standard:
   i) each separately billed part of a Multiple Occupancy Property is to be counted as a separate Property;
   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
   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.

Risk	Target for full compliance
Failure to deliver water continuously at the required pressure negatively impacts the ability of customers to use water.	To achieve full compliance, Sydney Water needs to demonstrate that it has met the minimum standard for water continuity as set out in its Operating Licence for the audit period 2016/17.

Evidence sighted

- 615402 - SPS 2 Water Continuity Standard - PI Sheet.docx
- 615403 - SPS 3 3 or More Unplanned Interruptions - PI Sheet.docx
- BI - Water Networks Report.pdf
- IICATS - Unplanned Interruption Report.xlsx
- Water Continuity Standard_Folio of Progress 2016-17.pdf

Summary of reason for grade

Sydney Water has provided sufficient evidence that the water continuity standards in its Operating Licence has been met during the audit period.

Discussion and notes

Sydney Water noted that over the reporting period it had shifted its operational philosophy for repairing leaks to slow the rate of leakage rather than stopping water flow altogether in order to reduce the number of customers affected by loss of continuity of supply during leakage events.

Data for water continuity events are initially logged in two separate systems; service faults and network events are logged in Maximo, whereas service requests and customer complaints are logged in CMS. Any work orders resulting from service requests and customer complaints are then logged in Maximo. It was noted that the majority of work orders are serviced by Sydney Water's Network Team, with contractors only called in for specialist work requests. Field data from Sydney Water's Network Team is logged in real time using Panasonic Tough Books that are linked to Maximo using FRM software. The location of Network Teams is also tracked via GPS by the field supervisor.

Sydney Water provided evidence of unplanned interruptions in the file "IICATS - Unplanned Interruption Report". Review of this file by the audit team identified that there were several instances where the work order finished time occurred before the restored date and time. Sydney Water advised that they are aware of the issue, which predominately results from issues with the connectivity of FRM and Maximo systems and the timestamp of data being sent from FRM not being

correctly logged in Maximo. Sydney Water is currently working towards a new software platform that should alleviate the current connectivity issues experienced with using FRM.

The data captured for unplanned interruptions is reported from Sydney Water's Business Intelligence system which uses a reporting query that interrogates work order data in Maximo.

Time was spent during the audit reviewing work order 72769951, where a leak had been reported on 3/5/2016 but not repaired until 8/12/2016. Review of the notes for this work order found that the initial report was that of a minor leak from a hydrant connection point, which had been promptly attended by a Network Technician who attempted to repair but found that the damage would require a specialist part to be ordered. Once the part had been received, replacement was scheduled with Network Team, and due to the low priority of the repair it was some months until the network team were able to attend and complete the repairs. The audit team were satisfied that had been appropriately attended to and resolved, despite the seemingly long duration.

A second example, work order 73554417, was also reviewed by the audit team where the time on site (9:25am) was reported as being after the time that service had been restored (9:16am). Investigation of the work order report found that this was a minor repair that had been promptly been attended to by a Network Technician, and that it appears that the Technician may have forgotten to register their attendance to site when they first arrived, and subsequently logged it when they entered in their job data once the repair had been made. As the record for the attendance to site is an automatic time stamp when the Technician logs arrival to site, whereas the time that service is restored is a user defined input, it is possible for there to be a minor discrepancy between the recorded time on site and time that service is restored if the Technician fails to log arrival on site when they first arrive. As the time for "on site" does not form part of the Unplanned Water Interruption time calculation, the ability for incorrect data entry for the time "on site" does not impact upon Sydney Water's reported performance.

The total number of properties affected by an Unplanned Water Interruption is logged in Maximo, based on the count of affected properties that is entered by the Network Technician. Details on the specific properties affected for purposes of billing/rebates is logged separately by the Network Technician via FRM, which in turns is sent to Sydney Water's Tenzing system, which is subsequently linked to Hyrda and then to Sydney Water's billing system ACCESS.

The auditors consider that Sydney Water has an appropriate calculation in place for this standard and that the work order data on which the calculations are based is sufficiently reliable for reporting purposes.

Recommendations

There are no recommendations in relation to this sub-clause.

Opportunities for improvement

No opportunities for improvement have been identified in relation to this sub-clause.

Table B-20. Clause 4.2.3 compliance grade

Subclause	Requirement	Compliance grade
4.2.3	Wastewater Overflow Standard a) Sydney Water must ensure that, in any financial year: i) no more than 14,000 Properties (other than Public Properties) experience an Uncontrolled Wastewater Overflow in dry weather; and ii) no more than 175 Properties (other than Public Properties) experience three or more Uncontrolled Wastewater Overflows in dry weather (the Wastewater Overflow Standard). b) For the purpose of the Wastewater Overflow Standard: i) each Multiple Occupancy Property is to be counted as a single Property; [Note: For example, a complex of five townhouses where each townhouse receives a separate bill from Sydney Water is to be counted as a single Property.] 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 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.	Full compliance

Risk	Target for full compliance
Uncontrolled overflow of sewage creates public health and environmental risks and is a nuisance to the public.	To achieve full compliance, Sydney Water needs to demonstrate that the minimum standards for wastewater overflows in its Operating Licence have been met during the audit period 2016/17.

Evidence sighted

- 464909 - Sewage Overflows Standard - PI Sheet - A.docx
- 464910 - Sewage Overflows Standard - PI Sheet - B.docx
- BI - Property Compliance Sewage.xls
- BI - Wastewater Network Performace Report.pdf
- iConnect - Wastewater Overflow Folio.docx
- iConnect - Wastewater Overflow Standard Folio.docx
- Wastewater Overflows Standard Folio 2016-17.pdf

Summary of reason for grade

Sydney Water has provided sufficient evidence that the wastewater overflow standard in its Operating Licence has been met.

Discussion and notes

As for the water continuity standard, Sydney Water reports this data from its Business Intelligence system which uses a reporting query that interrogates work order data in Maximo, this data is tracked and monitored on a monthly basis as detailed in the Network Performance Report. It was noted that the distinction between public and private properties for this data is determined by Sydney Water's billing system, based on the data entered into Maximo by the Network Technician regarding which properties the wastewater was observed flowing/pooling on.

Clarification was sought by the audit team as to the distinction between a controlled vs. uncontrolled wastewater overflow event, and how wastewater is distinguished from potable water leaks; Sydney Water advised that the controlled overflow events refers to those whereby an overflow occurs via a designated overflow point/system in the network, whereas the latter may occur at any other undefined point in the network. With regards to distinguishing between wastewater and potable water leaks, where it is not immediately obvious to the trained Network Technicians (e.g. underground leakage source), wastewater overflow may be determined by tracing back to the originating assets, visual/odour signs, or laboratory testing (where suspected but otherwise undeterminable).

During the course of the audit, two example work orders were reviewed. The first was work order 72925782, for which it was found it was found that the time that the leak/overflow has ceased was not recorded, and that the priority for this item was rated as only P4 (medium priority). Sydney Water investigated this work order further and advised that this event had been picked up by its reporting as an overflow based on the activity code when in fact an overflow did not occur. The event was a blockage that was contained in a sewer and which was cleared by a private plumber. Because the event location was public, there is no impact on the reporting for this indicator which is for private property only. Nevertheless, we recommend that Sydney Water reviews its categorisation of event codes and reporting for sewer overflows for all events (i.e. to both public and private land) so that it is satisfied that it is accurately reporting sewer overflow events. For the avoidance of doubt, this recommendation relates to all overflow events, not just to overflows to private property as reported at this indicator, because of the public health risk associated with any overflow and because of the commonalities in recording and reporting overflow events.

The second example considered was work order no. 72929314, for a property located at Korokan Rd Lilli Pilli that reported sewage overflow at the rear of the property. Investigation found that the cause was tree root ingress at the connection point to Sydney Waters network, which was subsequently cleared.

The audit team requested additional, more detailed data to be provided outlining full details on the address, customer comments, customer reported problem type and work order description for each of the reported sewage overflow events.

During review of these examples, the auditors sought clarification on the customer comments field recorded in Maximo. It was noted by Sydney Water that service request information is not well integrated into Maximo. This means that some of the information provided by customers is not readily available to field staff or for later analysis of events.

On review of the data provided and the examples cited, the auditors consider that Sydney Water has an appropriate reporting process in place for this standard and that the work order data on which the calculations are based is sufficiently reliable for reporting purposes.

Recommendations

We make no recommendations in relation to this sub-clause.

Opportunities for improvement

OFI4.2-1: We suggest that Sydney Water reviews its categorisation of event codes and reporting for sewer overflows for all events (i.e. to both public and private land) so that it is satisfied that it is accurately able to report on sewer overflow events. For the avoidance of doubt, this recommendation relates to all overflow events, not just to overflows to private property as reported at this performance standard, because of the public health risk associated with any overflow and because of the commonalities in recording and reporting overflow events

Clause 4.3 – Response time for water main breaks

Table B-21. Clause 4.3.1 compliance grade

Subclause	Requirement	Compliance grade
4.3.1	Sydney Water must report, in accordance with the Reporting Manual, on response times for water main breaks and leaks.	Full compliance

Risk	Target for full compliance
If response time for water main breaks and leaks are not reported accurately, the impact of bursts and leaks on customers will not be known with certainty.	To achieve full compliance, Sydney Water needs to demonstrate that it accurately reports on response time for water main breaks and leaks during the audit period 2016/17.

Evidence sighted

- 609973 - IPART I 9 Percentage P6 in 3hrs - PI Sheet.docx
- 609974 - IPART I 10 Percentage P5 in 6hrs - PI Sheet.docx
- 609975 - IPART I 11 Percentage P5 in 24hrs - PI Sheet.docx
- 609976 - IPART I 12 Percentage P4 in 5 days - PI Sheet.docx
- CM0003 - SDIMS Work Instruction for FRM Error Correction.docx
- Compass - FRM Training Records.xlsx
- D0000101 - Allocation of Civil Maintenance jobs.docx
- D0000121 - Field Reporting Guide.pdf
- FRM - Leak Cease-Overflow Warning.jpg
- FRM - Water Off Warning.jpg
- FRM - Water On Warning.jpg

Summary of reason for grade

Sydney Water has provided sufficient evidence that it reports response times for water main breaks and leaks in accordance with the Reporting Manual.

Discussion and notes

Sydney Water records and reports on time to respond to water main breaks using the same systems and processes as for the system performance standards at 4.2, That is, field staff record time on site and time to restore service using their mobile field devices which is stored in Maximo. The start time is when Sydney Water is first notified of the event by customers on the 24-hour emergency line 13 20 90. The Reporting is through BI. Sydney Water advised that the following particulars for recording event start and end times:

- If the mechanism of the asset failure requires the water main to be isolated prior to actual repair, then the job is considered as a "main break". The work crew will stop the loss of water by closing upstream and downstream valves, and the timestamp with which all the necessary valves have been closed is entered as "Water Off Time" into FRM software.
- If the mechanism of the asset failure is less severe and the water main can be repaired in-situ without needing isolation, then the job is considered as a "main leak". The work crew will proceed to repair the water main until they have stopped the loss of water, and the time at which water loss has ceased is manually recorded as "Leak Cease Time"
  The response time duration of a single water main break is calculated as the difference between "Workorder Reported Date" and "Water Off Time"
- The response time duration of a single water main leak is calculated as the difference between "Workorder Reported Date" and "Leak Cease Time"

The timestamps are recorded within FRM first, and then transferred to Maximo. There is a guideline detailing the process (D0000121 - Field Reporting Guide). We queried Sydney Water as to what training staff receive on these processes. Sydney Water responded that all new field employees are

put through the FRM training before they are placed into work crews. Training records are stored in Compass.

Sydney Water conducted an internal audit covering the reporting of its system Performance Standards, IPART Infrastructure indicators and the Response time for water main breaks, in June 2017 and this report was provided to us (System Performance Standards Audit Report 2017-06-15 BMIS Audit Number: A0000135). This report identified two improvement opportunities and one minor non-conformance. The minor non-conformance relates to an outstanding need for Sydney Water to formalise a strategy for temporary pressure gauging stations. Sydney Water also runs weekly data error reports.

Recommendations

No recommendations have been identified in relation to this sub-clause.

Opportunities for improvement

No opportunities for improvement have been identified in relation to this sub-clause.

Clause 5.1 – Customer Contract

Table B-22. Clause 5.1.2 compliance grade

Subclause	Requirement	Compliance grade
5.1.2	Sydney Water must make a copy of the Customer Contract available to any person, free of charge: • on its website for downloading; and • upon request made to the Contact Centre.	Full compliance

Risk	Target for full compliance
Putting in place barriers to the provision of information within the Customer Contract creates a risk in understanding the provisions that customers are entitled to. Not making the information free of charge creates an equity risk to the provision of information.	That Sydney Water has evidence to show that it has made a copy of the Customer Contract available to any person, without cost, via its website or through its Contact Centre on request from any person.

Evidence sighted

- Interviews with:
  - Manager Customer Programs
  - Manager Contact Centre
- Responses to audit questionnaire questions.
- Analytics Sydney Water Customer Contract Download 20160701-20170630.pdf
- Customer Contract_Folio of Progress 2016-17.pdf
- Website reference details Customer Contract.pdf
- Website update details Customer Contract.pdf

Summary of reason for grade

Sydney Water noted that there were no updates to the Sydney Water website, Customer Contract section during the audit date scope. There were 214 external downloads of the Customer Contract for the 2016-17 audit period. Sydney Water provided a Google Analytics overview for the dates 1 July 2016 to 30 June 2017 to show evidence of downloads.

The second part of this clause could not be tested specifically as there were no requests for copies of the Customer Contract entered into the Customer Management System (CMS) during the 2016-17 audit period. Records of refresher training for complaints and contacts including the customer contract, were therefore requested for December 2016, to establish that customer call centre staff understand the issue and that the fact that no requests for copies of the Customer Contract, was indeed real. Records of training and its content were provided and found to be adequate.[291]

Discussion and notes

Sydney Water noted that there were no updates to the Sydney Water website, Customer Contract section during the audit date scope. The Customer Contract section of the website was last updated in 2015. Screenshots of the website for the Customer Contract (reference[292] and update details) provided as evidence confirmed that no updates had been made to the website with the last modification confirming Sydney Water's statement of 2015 being the last date of modification.[293]

The evidence above also confirmed that the Customer Contract was available on the Sydney Water website.

[291] 5.1.2 Customer Contact Centre Training Agenda - May 2017.pdf; 5.1.2 Complaint training attendee registers - December 2016; and 5.1.2 Complaint Handling Training Content - December 2016.
[292] Date of screenshot access 28/8/17, 11:25 am – out of audit date scope but accepted as evidence in this case.
[293] Date of last modification 21/10/2015, 2:22 pm.

To test the element of the clause dealing with downloading of the Customer Contract, the auditors requested evidence of website download records. Sydney Water provide a Google Analytics overview for the dates 1st July 2016 to 30th June 2017. Excluding Sydney Water internal downloads, there were 214 external downloads of the Customer Contract for the 2016-17 audit period. The auditor confirmed the dates of the download request and the number of downloads, which concurred with the Sydney Water statement.

The second part of this clause could not be tested specifically as there were no requests for copies of the Customer Contract entered into the Customer Management System (CMS) during the 2016-17 audit period. Records of refresher training for complaints and contacts including the customer contract, were therefore requested for December 2016, to establish that customer call centre staff understand the issue and that the fact that no requests for copies of the Customer Contract, was indeed real. Records of training and its content were provided and found to be adequate.[294]

Recommendations

There are no recommendations for this clause.

Opportunities for improvement

There are no opportunities for improvement for this clause.

[294] 5.1.2 Customer Contact Centre Training Agenda - May 2017.pdf; 5.1.2 Complaint training attendee registers - December 2016; and 5.1.2 Complaint Handling Training Content - December 2016.

Clause 5.2 – Providing Information

Table B-23. Clause 5.2.4 compliance grade

Subclause	Requirement	Compliance grade
5.2.4	Sydney Water must advertise in a Sydney-based newspaper at least annually on: • the types of account relief available for Customers experiencing financial hardship; and • rights of Customers to claim rebates and the conditions.	Full compliance

Risk	Target for full compliance
Without appropriate information in place, customers may not understand their payment options in times of hardship and may default on their bills, resulting in potential for disconnection and amplified work for the utility in the longer term. Customers may also not understand their rights and options for rebates if service levels are not met, resulting in dissatisfaction with the service provider.	Evidence to show that Sydney Water advertised, at least once in the audit date scope, 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.

Evidence sighted

- Interviews with:
  - Manager Customer Programs
  - Manager Contact Centres
- Responses to audit questionnaire questions.
- Advertisement Daily Telegraph.pdf
- Advertisement Illawarra Mercury.pdf
- Advertisement Sydney Morning Herald.pdf
- Corporate Communciations Workplan 2016-17.mpp
- Corporate Communciations Workplan 2016-17.pdf
- Customer Contract_Folio of Progress 2016-17.pdf

Summary of reason for grade

Sydney Water met the requirement to advertise in a Sydney-based newspaper through advertising in the Sydney Morning Herald. Sydney Water also advertised in two other newspapers, these being the Daily Telegraph and the Illawarra Mercury, to ensure coverage of its area of operations.

Sydney Water's advertisement in all three newspapers covered the requirements of this sub-clause, these being advertising on account relief options and rights of customers to claim rebates (including the conditions). This sub-clause therefore achieves full compliance.

Discussion and notes

Sydney Water's area of operations is extensive and therefore, requires advertising coverage that will meet that area of operations. On 15th February 2017, advertisements[295] were placed in the following newspapers:

- Sydney Morning Herald
- Daily Telegraph
- Illawarra Mercury

[295] "Notice of service rebates and financial assistance options."

While one newspaper was included to cover the Illawarra area, there was no specific newspaper for the Blue Mountains (e.g. Blue Mountains Gazette). The Sydney Morning Herald, however, is likely to reach Blue Mountains' customers and further, Sydney Water is only required to advertise in a Sydney-based newspaper.

The advertisements were provided as scanned copies of the newspaper pages and contained the following website details for those wishing to contact Sydney Water via the internet:

- the types of water and wastewater issues that might cause hardship
- service rebates and amounts
- options for people experiencing hardship
- telephone contact details for Sydney Water and the operating hours of the call centre.

Recommendations

There are no recommendations for this clause.

Opportunities for improvement

There are no opportunities for improvement for this clause.

Clause 5.4 – Assistance Options for Payment Difficulties and Actions for Non-Payment

Table B-24. Clause 5.4.3 compliance grade

Subclause	Requirement	Compliance grade
5.4.3	5.4.3 Sydney Water must provide, free of charge, an explanation of the Assistance Options for Payment Difficulties and Actions for Non-Payment to: • residential Customers, at least annually with their Bills; • 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 • any other person upon request made to the Contact Centre.	Full compliance

Risk	Target for full compliance
Without informing customers and any other persons, they may not understand their payment options in times of hardship and may default on their bills, resulting in potential for disconnection and amplified work for the utility in the longer term.	Evidence to show that Sydney Water has an explanation document or other, on the Assistance Options for Payment Difficulties and Actions for Non-payment in place. Evidence to show that the above information was provided at least annually with customer bills and to anyone experiencing financial hardship (on the date the customer was identified as experiencing financial hardship). Evidence to show how Sydney Water has determined that the customer is experiencing financial hardship. Evidence to show that any other person requesting that information through the Contact Centre, was provided with the information.

Evidence sighted

- Interviews with:
  - Manager Customer Programs
  - Manager Contact Centre
- Responses to audit questionnaire questions.
- Assistant options for payment difficulties and actions for non payment_Folio of Progress 2016-17.pdf
- Payment Assistance Policy.pdf
- Payment Assistance Scheme Procedure.pdf
- Waterwrap Feb-April 2017 - Payment Assistance.pdf
- Payment assistance policy_Web_March 2016
- Sydney Water Policy - Overdue payments and disconnections for non-payment
- 5.4.3 - CMS Payment Assistance examples
- PAS_Assessment checklist for agencies.pdf
- PAP - Monthly Reporting_2016-17.xlsx

Summary of reason for grade

Sydney Water has a Payment Assistance Policy in place which was in audit date scope and fulfils the requirement for the explanation of the assistance options available for customers experiencing hardship. There is no specific section in the policy which clearly states what the actions for non-payment will be, while not non-compliant, this aspect could be improved by including a link to the 'Overdue payments and disconnections for non-payment policy' at Guiding Principle 3.

The water bill contains instructions[296] to customers if they have difficulty paying their bill. As the bill is sent out quarterly, Sydney Water has met its requirement to provide information at least annually with bills.

Evidence to show how Sydney Water records customer information and deals with identification of hardship was viewed through the Customer Management System. Records checked confirmed the process. NGOs also refer hardship customers to Sydney Water and Sydney Water has trained and provided these NGOs with a hardship checklist.[297]

A Payment Assistance Scheme Procedure is in place and was current for the audit date scope.[298]

Sydney Water's Customer Management System (CMS) does not currently include a field for identifying when a customer is first identified as experiencing hardship. It may be useful to consider adding such a field to the CMS.

Discussion and notes

Sydney Water has a Payment Assistance Policy in place which fulfils the requirement for the explanation of the assistance options available for customers experiencing hardship. The policy provided post site visit was dated as being outside[299] of the audit date scope. Sydney Water provided post site visit evidence to show that the policy was updated 9th March 2016 which was within the audit date scope. The policy contains a definition[300] of hardship, this being:

> *"Financial difficulties that make it difficult to pay for essential items and services."*

Section 3 of the policy deals with payment assistance options and eligibility from both a government and Sydney Water support perspective.

There is no specific section in the policy which clearly states what the actions for non-payment will be. There is one statement which states what could be included:

> *"Customers who do not contact us or do not keep their arrangements, may have debt recovery action taken on their account. This **could include** restriction of water supply."*
> [bold our emphasis]

To support the above, Sydney Water provided post site visit evidence of its 'Overdue payments and disconnections for non-payment policy'.[301] This policy sets out the actions that Sydney Water would take in the event of non-payment of bills. For clarity, it would be helpful to show linkages between the two policies.

The water bill contains instructions[302] to customers if they have difficulty paying their bill. As the bill is sent out quarterly, Sydney Water has met its requirement to provide information at least annually with bills.

A Payment Assistance Scheme Procedure is in place and was current for the audit date scope.[303]

Sydney Water noted that Payment Assistance details were included in Waterwrap newsletters throughout the audit period. Waterwrap newsletters are included with hardcopy postal bills and a link is provided to eBill Customers. Details of BillAssist, Sydney Waters' financial assistance program were confirmed by the auditor as being included in Waterwrap Feb-April 2017[304] edition.

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[296] Within the 'Customer Information' section on page 2 of the bill.
[297] PAS_Assessment checklist for agencies.pdf (no currency, assumed current for audit date scope).
[298] Document current at 15 July 2016.
[299] Last updated 20 July 2017.
[300] Payment Assistance Policy.pdf, Guiding principle 3, p2.
[301] Current as at 1 June 2016.
[302] Within the 'Customer Information' section on page 2 of the bill.
[303] Document current at 15 July 2016.
[304] Waterwrap Feb-April 2017 - Payment Assistance.pdf , SW114 12/16, top right corner p2.

Evidence for customer contact and identification of hardship was viewed via access to the Customer Management System and via requests for the months of March 2017 and December 2016 (dates requested by the auditor) at the interviews. Letters were viewed that had been sent to customers on identification of hardship. Sydney Water noted that there were two examples of 'first identification of hardship' for the December 2016 period (3952680 and 4895244) and three examples for the March 2017 period (3604653, 4383128 and 5022666[305]). For the evidence provided, it was difficult to clarify how 'first identification of hardship' is assigned as the CMS currently does not include a field which would easily identify the first date the customer was identified as experiencing financial hardship. An opportunity for improvement has been identified.

Recommendations

There are no recommendations for this clause.

Opportunities for improvement

OFI 5.4-1: Sydney Water could consider referencing its 'Overdue payments and disconnections for non-payment policy' in its 'Payment Assistance Policy' at Guiding Principle 3, so that customers can see the suite of actions that Sydney Water may use.

OFI 5.4-2: As the CMS does not currently include a field which would easily identify the date a customer was identified as first experiencing financial hardship, this field should be considered for addition to facilitate Sydney Water's demonstration of compliance with clause 5.4.

[305] 5.4.3 - CMS Payment Assistance examples.

Clause 5.8 – Code of Conduct

Table B-25. Clause 5.8 compliance grade

Subclause	Requirement	Compliance grade
5.8	Sydney Water must use its best endeavours to cooperate 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.	Full compliance

Risk	Target for full compliance
Not having an appropriate Code of Conduct in place with each Licensed Network Operator and Licensed Retail Supplier within the Area of Operations means that governance risks to the water supply network could occur and risks to consumers ensue. Not understanding who may interact with Sydney Water's network may result in the potential for contamination of the network through missed or sub-standard connections as well as the potential to miss these connections in future planning requirements.	Evidence to show how Sydney Water has identified current Licensed Network Operator and Licensed Retail Supplier within Sydney Water's Area of Operations and the type of communication had. Evidence of 'best endeavours' including meetings, liaison records etc. Evidence of outcomes of cooperation within the audit date scope e.g. implementation of requests where existing.

Evidence sighted

- Interviews with:
  - Manager Competition and Licensing
  - Manager Customer Programs
  - Manager Contact Centre
- Responses to audit questionnaire questions.
- Code of Conduct - WICA Licensees_Folio of Progress 2016-17.pdf
- Shared Drive - USA Table of Contents.pdf
- IPART Letter - SWC - Shepherds Bay Licence ap
- Letter from developer to licensee asking for licensee to formally investigate recycled water options November 2014
- Email train between licensee and Sydney Water November 2014
- WVWSA_26765 Contract Meeting No 28 Minutes - 12Jul16

Summary of reason for grade

Sydney Water is made aware of WIC Act licenses through two avenues, these being notification by IPART of all WIC Act licence applications and approaches to Sydney Water by the licensee itself. We were provided with evidence (including from IPART) which confirmed that both of these avenues occur. Further, Sydney Water provided evidence to show that it keeps a record of WIC Act licensees and interactions with Sydney Water.

Sydney Water interprets its Operating Licence requirement of using 'best endeavours' to mean:

- To negotiate in good faith and
- Respond to requests to establish a code of conduct in a timely manner.

The auditor agrees that Sydney Water has formed a reasonable interpretation of 'best endeavours'.

Sydney Water notes that it is not required to proactively seek to establish codes of conduct if such a request has not been made from a licensee. The auditor agrees (and confirmed with IPART) that given the wording of the Operating Licence clause,[306] this interpretation is reasonable.

Sydney Water notes that the typical arrangement between Sydney Water and a WIC Act licensee is via its Utility Services Agreement (USA) rather than a code of conduct. IPART confirmed:

> *"…that in the absence of a water industry code of conduct under cl 25 of the* Water Industry Competition (General) Regulation 2008*, where a Utilities Service Agreement (or any other agreement) between a public water utility and WIC Act licensee includes the requirements of the standard WIC Act licence condition B10, IPART considers it to have met the requirements of a code of conduct."*[307]

There is currently only one code of conduct in force (for Bingara Gorge). The commercial agreement in place between the two parties includes operating protocols and regular communication via email and meetings.[308] Information[309] was provided to demonstrate evidence of communication.

Discussion and notes

Clause 25(1) of the WIC Regulation states that:

> *"The Minister may, by order published in the Gazette, establish a code of conduct in relation to the respective responsibilities of licensed network operators, licensed retail suppliers and public water utilities."*

The code of conduct may make provision with respect to the following matters:

> *"(a) responsibility for water quality,*
>
> *(b) liability in the event of the unavailability of water,*
>
> *(c) liability in the event of infrastructure failure,*
>
> *(d) fees and charges payable in respect of the use of infrastructure,*
>
> *(e) responsibility for handling customer complaints."*[310]

Sydney Water interprets its Operating Licence requirement of using 'best endeavours' to mean:

- To negotiate in good faith and
- Respond to requests to establish a code of conduct in a timely manner.

The auditor agrees that this is a reasonable interpretation of 'best endeavours'.

Sydney Water notes that it is not required to proactively seek to establish codes of conduct if such a request has not been made from a licensee. The auditor agrees that given the wording of the Operating Licence clause,[311] that this interpretation is reasonable.

The code of conduct in clause 25 of the WIC Regulation only applies where there is interconnecting infrastructure between the WIC Act licensee and Sydney Water. Further, Sydney Water notes that the obligation is limited to circumstances where a code of conduct is sought by the WIC Act licensee. The obligation therefore being on the licensee to contact Sydney Water with a request, at which point 'best endeavours' is triggered.

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[306] "*…..each Licensed Network Operator and Licensed Retail Supplier within the Area of Operations that* ***seeks to establish*** *with Sydney Water a code of conduct*" [bold our emphasis].
[307] Email from Director, Licensing and Compliance, IPART, to auditor, 3 October 2017.
[308] Code of Conduct - WICA Licensees_Folio of Progress 2016-17.pdf
[309] WVWSA_26765 Contract Meeting No 28 Minutes - 12Jul16
[310] Clause 25(3).
[311] "*…..each Licensed Network Operator and Licensed Retail Supplier within the Area of Operations that* ***seeks to establish*** *with Sydney Water a code of conduct*" [bold our emphasis].

Sydney Water's awareness of WIC Act licensees manifests from two streams:

- Notification by IPART of all WIC Act licence applications:
  - In this case, and in its response to IPART, Sydney Water notes whether the WIC Act licensee will be required to enter into an agreement for the provision of services by Sydney Water.
  - IPART verbally confirmed that its process is to send out notification to all public water utilities. A letter from IPART to Sydney Water was also provided as evidence for notification of the residential development of Shepherds Bay as a variation to an existing retail supplier's licence.[312]
- Approach to Sydney Water by the WIC Act licensee.
  - We checked and confirmed evidence[313] of correspondence for the Shepherds Bay scheme both from the licensee and the developer. While the correspondence of notification was outside of the audit date scope, it was confirmed by both Sydney Water and IPART as being the last notification and therefore, was accepted as evidence of the process.

Sydney Water notes that the typical arrangement between Sydney Water and a WIC Act licensee is via its Utility Services Agreement (USA)[314] rather than a code of conduct.

The USA contains provisions outlined by Clause 25(3) above e.g.:
- Services (inclusions and exclusions)
- Sydney Water to act reasonably
- ROLR/OOLR provisions
- General obligations
- Liabilities
- Water and wastewater services (as schedules).

Sydney Water keeps a record of the WIC Act licensees and interactions. Evidence[315] to support this fact was provided and confirmed. There is currently only one code of conduct in force (for Bingara Gorge). The commercial agreement in place between the two parties includes operating protocols and regular communication via email and meetings.[316] Information[317] was provided to demonstrate evidence of communication.

Sydney Water notes that the typical arrangement between Sydney Water and a WIC Act licensee is via its Utility Services Agreement (USA) rather than a code of conduct. IPART confirmed:

> *"…that in the absence of a water industry code of conduct under cl 25 of the* Water Industry Competition (General) Regulation 2008*, where a Utilities Service Agreement (or any other agreement) between a public water utility and WIC Act licensee includes the requirements of the standard WIC Act licence condition B10, IPART considers it to have met the requirements of a code of conduct."*[318]

We note that the Bingara Gorge licensee's (Water Solutions & Technologies (Australia) Pty Ltd) Network Operator's Licence was varied[319] to include a new service, a sewer rising main, in 2015 and

[312] email 'RE Shepherds Bay'IPART Letter – Shepherds Bay ap, 9 November 2016.
[313] Letter from developer to licensee asking for licensee to formally investigate recycled water options November 2014; email train between licensee and Sydney Water November 2014.
[314] Shared Drive - USA Table of Contents.pdf.
[315] Code of Conduct - WICA Licensees_Folio of Progress 2016-17.pdf
[316] Code of Conduct - WICA Licensees_Folio of Progress 2016-17.pdf
[317] WVWSA_26765 Contract Meeting No 28 Minutes - 12Jul16
[318] Email from Director, Licensing and Compliance, IPART, to auditor, 3 October 2017.
[319] https://www.ipart.nsw.gov.au/files/sharedassets/website/trimholdingbay/network_operator_licence_variation_application_from_veolia_water_solutions_and_technologies_australia_pty_ltd.pdf; https://www.ipart.nsw.gov.au/files/assets/website/water/water-static-pages/summaryofauditframework-formatted_002.pdf

therefore discussed this issue at the audit interview to test whether any changes had been made to the code of conduct.

The 'Wilton Recycled Water Scheme at Bingara Gorge Code of Conduct for Infrastructure Connection' relates to the interface requirements of delivering potable water from Sydney Water's drinking water network to the recycled water network owned and operated by Veolia Solutions and Technologies (Australia) Pty Ltd. Sydney Water has in place a contract with Veolia regarding the wastewater services. Veolia has not approached Sydney Water to enter into a Code of Conduct for the wastewater services and therefore, the auditor considers it reasonable that the current code of conduct for Bingara Gorge has not been changed.

Recommendations

There are no recommendations for this clause.

Opportunities for improvement

There are no opportunities for improvement for this clause.

Clause 7 – Quality management system

Table B-26. Clause 7.1.1 compliance grade

Subclause	Requirement	Compliance grade
7.1.1	By 30 June 2017, Sydney Water must develop a Management System that is consistent with the Australian Standard AS/NZS ISO 9001:2008: Quality Management Systems - Requirements (the Quality Management System).	Full compliance

Risk	Target for full compliance
This is a compliance risk for Sydney Water that flows into not meeting their licence agreements by the date specified	A quality management system that meets the requirements of AS/NZ 9001:2008

Evidence sighted

- iconnect QMS page for ipart audit 2017.pdf
- QMS Implementation Plan - June 2017 (public version).pdf
- Quality Management System_Folio of Progress 2016-17.pdf
- CDP Goals.pdf
- D0000217 - Risk Management Standard.docx
- IMS - certificate of registration.pdf
- QMAF0081 - Guideline A Risk Management Process.docx
- QMS ISO9001 Assessment - June 2017.pdf
- QMS presentation 170920_final.pptx
- SDIMS0002.pdf
- SDIMS0012_management review procedure.docx

Summary of reason for grade

Sydney Water has developed a quality management system consistent with ISO 9001:2015. It currently holds IMS certification to ISO 9001:2015 for Delivery of Products and Services to Customers and has identified in scope business services that are included in their QMS. Sydney Water has developed a portal for its QMS which can be accessed internally by clicking on the QMS 'Cog'. Each component of the QMS 'Cog' links through to relevant areas relating to the business and ISO 9001:2015 clauses. This QMS 'Cog' forms the quality model for the business. Sydney Water has conducted a gap assessment of the standard and documented how they meet the requirements of the standard. The auditors sampled this evidence and are satisfied that the requirements of the sub-clause have been met.

The subclause was awarded full compliance.

Discussion and notes

Sydney Water has developed a quality management system consistent with ISO 9001:2015. According to clause 12.2(d) of the Sydney Water operating licence:

> *"A reference in this Licence to a document (original document) is a reference to the original document as amended or revised or, where the original document is replaced, to the replacing document, or the document that most closely approximates the original document."*

In our view a system developed to be consistent with ISO 9001:2015 does not breach this clause.

Sydney Water already holds certification[320] to ISO 9001:2016 for Delivery of Products and Services to Customers. The scope of this certification covers:

> *"Management of provision of drinking water, recycled water, wastewater services and related activities. Management of product monitoring process, physical security services for Sydney Water sites and assets, design, testing integration and maintenance of SCADA software and systems, management & optimisation of network operations.*
>
> *Management of Sydney Water's relationship with business customers and case management of infill and greenfield land development"*

Sydney Water will maintain this certification and is seeking certification for processes not currently certified. A detailed list of in scope business processes for the QMS was provided.[321]

Sydney Water has developed a portal for its QMS which can be accessed internally by clicking on the QMS 'Cog'. Each component of the QMS 'Cog' links through to relevant areas relating to the business and ISO 9001:2015 clauses. This QMS 'Cog' forms the quality model for the business. Sydney Water has taken the sensible step of moulding its business around the standard. This has allowed Sydney Water to tailor its QMS to meet the organisation's needs and incorporate existing systems[322] rather than develop all systems *de novo*.

The Cog contains seven parts:

- Risk management
- Management system performance and improvement
- Training, competence and awareness
- Assurance and audit
- Our processes
- Strategy and planning
- Document and records management

We used the quality management principles from the ISO 9001:2015 guidelines as the starting point for assessing this clause. Through discussion with Sydney Water the auditors understood the QMS 'Cog' outcomes to link to the quality management principles as shown in Table B-27.

Table B-27. Quality management principles and their interpretation at Sydney Water.

Quality Management Principle[323]	Sydney Water Interpretation
Customer focus	Strategy and planning
Leadership	Policy
Engagement of people	Strategy and Planning Training, competence and awareness
Process approach	Our processes
Improvement	Management system performance and improvement Training, competence and awareness
Evidence-based decision making	Management system performance and improvement Assurance and audit Risk management Document and records management
Relationship management	Strategy and planning Training, competence and awareness

The auditors were able to drill down on specific components and review the evidence. The *Our Processes* Cog provides a good, succinct overview of all of Sydney Water's products and services

[320] IMS Certificate of Registration FS 663513
[321] Appendix 1 QMS Implementation Plan - June 2017 (public version).pdf
[322] Helix, SWIM, IMS and BMIS.
[323] AS/NZS ISO 9000:2016 Quality management systems—Fundamentals and vocabulary.

including linkages through to Helix. Sydney Water demonstrated its QMS has a clear cascading of business planning goals to individual contribution development plans (CDPs[324]). The 'Plan on a Page' concept, the identification of Sydney Water's products and services and the clear identification of top to bottom business goals, has been used to help fulfil clause 8. The explicit risk approach of the 2015 guidelines was supported by Sydney Water's risk management documents.[325, 326]

Sydney Water has conducted a gap assessment of its systems against the relevant clauses (4-10) at a sub-clauses level and demonstrated that the ISO 9001:2015 requirements has been met.[327]

Table B-28. Quality management clauses and supporting information

Clause	Area	Documented information and other evidence
4	Context	Corporate strategy, Corporate Plan, Management review minutes, External stakeholder lists, Stakeholder sentiment survey, Compliance accountability register, Operating Licence Annual Audit Report (QMS folio), Helix, All processes have a RACI, Risk Management Framework[328]
5	Leadership	E-news articles, Minutes from CGM meetings, QMS requirement in GM goals, iConnect page[329], Promotion of management systems policy, Lifestream Plan, Customer strategy, Process architecture designed around customer journey[330], Helix, Management Systems Policy, Helix, CDP process[324]
6	Planning	QMAF0080 - Risk Management Framework, Helix - Risk management, Business planning, QMAF0015 - Management review/ BPRF
7	Support	QMS Business Case, QMS Implementation plan[331], Established external resources - BSI for certification, auditing & training, SDIMS0002 - IMS Overview manual[332], certification to ISO/IEC 17025, Helix - CDP process[324], QMS Implementation plan[331], QMAF0001 - Management system policy, Helix - Stakeholder & communications processes, SWIM, BMIS, Confluence, SWIRL
8	Operation	SDIMS0002 - IMS Overview manual[332], Corporate Plan, Business Plans, , Procurement framework, Operating Licence reports, Customer Delivery Management Review report, Management review minutes, BPRF reports, QMAF0008 - Document and records management, QMAF0015 - Management Review, QMAF0008 - Document and records management, Delivery Management design procedure - FAC-D-008IT Project Delivery Framework, Procurement & Legal Framework, QMAF0011 - Action Request procedure, QMAF0015 - Management Review procedure, Incident & investigation procedures
9	Performance Evaluation	QMAF0014 - Monitoring and measurement procedure, D000397 - Assurance Management policy, Helix - Assurance processes[333], QMAF0015 - Management review procedure, Customer Delivery - ISO9001 Certified IMS[320], QMAF0015 - Management reviewQMAF0014 - Monitoring and measurement procedure
10	Improvement	QMAF0015 - Management Review, QMAF0011 - Action request, SDIMS0002 - IMS Overview manual[332]

[324] CDP Goals.pdf
[325] D0000217 - Risk Management Standard.docx
[326] QMAF0081 - Guideline A Risk Management Process.docx
[327] QMS ISO9001 Assessment - June 2017.pdf
[328] QMAF0080 - Risk Management Framework.pdf
[329] iconnect QMS page for ipart audit 2017.pdf
[330] Demonstrated on-screen
[331] QMS Implementation Plan - June 2017 (public version).pdf
[332] SDIMS0002.pdf
[333]QMAF0012 – Auditing procedure was viewed on-line and includes requirements for both internal and external auditors.

The auditors sampled the evidence listed in Table B-28 as noted in the footnotes and confirmed documents aligned with the requirements of the standard.

Sydney Water advised the Stage 1 QMS audit is scheduled for 21-23 November 2017 with the follow up Stage 2 Certification audit for the QMS scheduled for 13 March 2018.

Recommendations

There are no recommendations for this clause.

Opportunities for improvement

OFI 7.1-1: Sydney Water could considered include using specialist technical auditors for relevant components of Sydney Water's business e.g. Exemplar Global Water Quality Management Systems auditors.

Clause 8 – Performance monitoring

Table B-29. Clause 8.4.1 compliance grade

Subclause	Requirement	Compliance grade
8.4.1	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	High compliance

Risk	Target for full compliance
The performance of Sydney Water is unable to be ascertained if reported data is inaccurate.	To achieve full compliance, Sydney Water needs to demonstrate that it maintains record systems that are sufficient to enable it to accurately report data in accordance with the Reporting Manual.

Evidence sighted

- 464903 - SPS1 Water Pressure Standard - PI Sheet.docx
- 464909 - SPS 4 Sewage Overflows Standard - PI Sheet - A.docx
- 464910 - SPS 5 Sewage Overflows Standard - PI Sheet - B.docx
- 615402 - SPS 2 Water Continuity Standard - PI Sheet.docx
- 615403 - SPS 3 - 3 or More Unplanned Interruptions - PI Sheet.docx
- CM0003 - SDIMS Work Instruction for FRM Error Correction.docx
- D0000058 Operating Licence annual reporting.docx
- D0000121 - Field Reporting Guide.pdf
- D0000355 Corporate Compliance Management System.pdf
- DOC0037 Datamart.docx
- DOC0327 Customer Delivery Regulatory Reporting Specification.docx
- DOC0333- Investigation and Reporting Water Pressure Failure.docx
- Folio - Performance Indicators and System Performance Indicators.docx
- IPART I 1 - Properties affected by unplanned water interuption.docx
- IPART I 10 - Percentage P5 in 6hrs.docx
- IPART I 11 - Percentage P5 in 24hrs.docx
- IPART I 12 - Percentage P4 in 5 days.docx
- IPART I 2 - Occurrence of water interruptions to affected properties.docx
- IPART I 3 - Events leading to planned or unplanned water interruption.docx
- IPART I 4 (S) - Residential properties.docx
- IPART I 5 - Residentual properties affected by water pressure failure.docx
- IPART I 6 - Number of high priority sewage overflows.docx
- IPART I 7 - Number of medium priority sewage overflows.docx
- IPART I 8 - Number of residential customers' dwellings affected by sewer spills.docx
- IPART I 9 - Percentage P6 in 3hrs.docx
- Memo - Approval for submission of CD data and reports.pdf
- QMAF0008 Document and records management procedure.pdf
- Records Management Policy draft 2017.pdf
- Records Management Policy.pdf
- SDIMS0015 Compilation of Regulatory Reports for Customer Delivery.docx
- System Performance Standards Audit Report 2017-06-15.xlsx
- Table 1 - Relationship between SPS and IPART Infrastructure Indicators.docx

Summary of reason for grade

We identified that an indicator (I5) had been incorrectly reported due to a misunderstanding of the reporting definition. We also found that in trailing work order records to Maximo that one important work order time field (overflow ceased) was not being routinely recorded and that for a small subset of records, a lesser level of information had been collected. We consider that these constitute minor shortcomings that do not compromise overall compliance with the objective of this clause.

Discussion and notes

Sydney Water has two main records systems for performance reporting:

1. The BMIS (Business Management Information System) stores and controls ISO management system related documents (Procedures, Policies, Work Instructions, Templates, Forms Audits and Action Request related documents).
2. The Sydney Water Information Management System (SWIM) is the overarching records management system for all other organisational records.

Sydney Water has in place a Records Policy and Document and Records Management procedure.[334]

Sydney Water has in place a Corporate Compliance Management System (Described in D000355) which includes reporting for operating licence compliance.

Each performance measure has a reporting procedure which details:

1. Indicator owner
2. Definition
3. Interpretation of the definition if required
4. Data provider, commentary provider and reporting manager
5. Approver
6. SQL coding for indicators reported through BI

System Performance Standards and IPART infrastructure indicators are reported in the System Performance Standards Report[335] and the Performance Indicators Report.[336] Sydney Water advised that it has in place various reporting and assurance processes to control the quality of the data reported including:

1. DOC0327 Customer Delivery Regulatory Reporting Specification
2. SDIMS0015 Compilation of Regulatory Reports for Customer Delivery
3. DOC0333 - Investigation & Reporting Water Pressure Failure
4. D0000121 - Field Reporting Guide
5. CM0003 - SDIMS Work Instruction for FRM Error Correction

We are satisfied that Sydney Water has in place appropriate business processes and procedures under its management systems for reporting this data. We also found that Sydney Water demonstrated strong awareness of the importance of the indicators and their derivation from the various systems and data sets.

Reporting is undertaken using data stored in a number of different information systems which include:

1. Maximo, the computerised maintenance management system particularly for field activities
2. ACCESS – the customer database
3. IICATS – the SCADA system
4. SWIRL – for events reportable to other parties

Generally, the Business Intelligence (BI) interface queries each of the source data systems.

[334] QMAF0080 - Risk Management Framework.pdf
[335] Operating Licence 2015-2020 Compliance and Performance Report System Performance Standards Report 2016-2017
[336] Operating Licence 2015-2020 Compliance and Performance Report Performance Indicators Report 2016-17

We queried Sydney Water to identify what assurance it undertakes for reported data to which it identified the following assurance activities:

- twice yearly updates of the Folios of Progress
- an annual review of PI sheets (covering indicator definitions, interpretations and data collection processes)
- checks and approvals at various levels including Business unit, Business area, Group and Corporate levels (e.g. email 'Memo - Approval for submission of CD data and reports', MD sign off 1st Sept 2016-17)
- various business procedures.

Sydney Water also advised that it conducted an internal audit covering the reporting of its System Performance Standards, IPART infrastructure indicators and the response time for water main breaks in 2017, (System Performance Standards Audit Report 2017-06-15 BMIS Audit Number: A0000135). This report identified two improvement opportunities and one minor non-conformance. The minor non-conformance relates to an outstanding need for Sydney Water to formalise a strategy for temporary pressure gauging stations.

During the audit interviews, we complemented our review of management systems, processes, and assurance activities with trailing of event records back to the source data systems and reporting systems. Below we consolidate observations from our review of data records and information systems for the System Performance Standards, response time to water main breaks and leaks and the IPART infrastructure indicators.

1. We identified with Sydney Water that indicator I5 had been incorrectly reported. The figure reported was 83; the correct figure is 40. The originally reported figure (83) is for all properties affected – both permanently and temporarily (occasional or recurrent in the reporting definition). Sydney Water advised that the misreporting was due to a misunderstanding of the indicator definition. We therefore recommend that Sydney Water review its reporting process for this indicator to provide assurance over future reported data. We also recommend that Sydney Water evaluate the data it has historically reported for this indicator and report corrected data if necessary.
2. We found in reviewing sewer overflow records for internal surcharge events that one in six sewer (21 out of 119) of those events for 2016/17 did not have recorded the time that the overflow ceased. (Note that internal surcharges are a small subset of total (internal and external) overflows). Consequently, Sydney Water adopted the time that the job was closed for this field. This is conservative as there is generally a reasonable delay (typically more than an hour) between the overflow ceasing and the job being closed. For a number of jobs, the total overflow was reported as lasting for days when it is highly unlikely that the overflow lasted that long. This does not impact on the reported data but it does call into question the quality of data captured in the field. An overflow has considerable impact on the community whether in private or public land and also creates a substantial public health risk. The time that the overflow lasts is a critical measure of the impact caused by the overflow. Therefore, we recommend that Sydney Water puts in place appropriate measures (e.g. training and awareness and controls on work order close out) to ensure that where required, overflow ceased times are recorded accurately in future.
3. We found that Sydney Water only infrequently records a before and after photo (or any photo) for sewage overflows. As noted, overflows cause considerable impact on the community, environment and public health and it is therefore appropriate that that more information is captured for these events. These photos can help assess the impact of the event (size, areas affected etc.) at a later date which will inform asset management and understanding of the customer experience. We therefore recommend that Sydney Water makes before and after photos mandatory for sewage overflows. Sydney Water indicated that it has commenced improvement in this area already.
4. There were some events where Sydney Water used a sub-contractor to undertake reactive works (e.g. WO # 72925671). In the initial stages of this arrangements, less work order

attribute information was collected by the sub-contractor than is usually collected by Sydney water. From the records we reviewed the attribute information captured was still sufficient to support performance reporting. Sydney Water advised that it has rectified this shortcoming.

5. In the audit year, Sydney Water was not maintaining an audit trail where the priority of an event had been changed. There are good reasons as to why priority may be changed as better information becomes available. However, any change should be transparent and the justification clear to others as this directly impacts reported performance data. In the records that we reviewed where priority had been changed, we could reasonably infer the justification for the change. However, maintaining an audit trail is critical to Sydney Water being able to demonstrate the veracity of this data. We therefore recommend that Sydney Water report separately for 2017/18 on events where the priority has been changed with justification for each change. This report should be able to be reconciled to a Maximo query.
6. Lastly, we noted that service request information is not linked to work order information in Maximo. For the purposes of audit, this made it sometimes difficult to understand the sequence of events that had occurred and the reason why an event had been categorised as it had. Beyond audit requirements, service request information can be invaluable to both field crews and for later analysis and understanding of the event. Service request information represents a key piece of the customer experience of service delivery. We therefore consider that there is a potential improvement opportunity in better linking service request and work order information. We are mindful however that the costs and benefits of any changes need to be carefully weighed up.

While items two to five in the above list do not lead us to think that any of the performance data has been incorrectly reported or has an obvious bias, we consider that when taken together, they call into question the sufficiency of Sydney Water's record systems for the purpose of performance reporting. We have commented that Sydney Water has considerable management processes and procedures in place. While there have apparently not prevented indicator I5 being incorrectly reported, our main concern is with quality control and sufficiency of work order data collected in the field. For this reason, we have awarded high compliance for this clause.

Recommendations

Recommendation 8.4-1: By 31st March 2018, Sydney Water should review its reporting process for infrastructure indicator I5 to provide assurance over future reported data.

Recommendation 8.4-2: By 31st March 2018, Sydney Water should evaluate the data it has historically reported for indicator I5 and report corrected data if necessary

Recommendation 8.4-3: By 31st December 2018Sydney Water should put in place appropriate measures (e.g. training and awareness and controls on work order close out) to ensure that overflow ceased times are recorded accurately in future.

Recommendation 8.4-4: By 30th June 2018 Sydney Water should assess whether its current processes for capturing site evidence for sewage overflow events (e.g. before and after photographs) and adherence to these processes is sufficient for its business processes.

Recommendation 8.4-5: By 30th June 2018, for the 2017/18 audit year Sydney Water should demonstrate that it has in place an appropriate audit trail for events where the priority has been changed. Appropriate evidence may include a schedule detailing the change made, the date of the change, who made the change, justification for the change.

Opportunities for improvement

OFI8.4-1: There is a potential improvement opportunity for Sydney Water to better link service request and work order information. We are mindful however that the costs and benefits of any changes need to be carefully weighed up.

Clause 9.1 – NSW Health

Table B-30. Clause 9.1.1 compliance grade

Subclause	Requirement	Compliance grade
9.1.1	Sydney Water must maintain the memorandum of understanding with NSW Health entered into under section 35 of the Act.	Full compliance

Risk	Target for full compliance
Non-compliance with the clause poses moderate operational risks. NSW Health is a key stakeholder and the activities managed through the MoU reduce Sydney Water's risks,	Evidence that Sydney Water has meet the obligation established in the MoU

Evidence sighted

- 614392 - Agenda JOG 29 May 2017.pdf
- 614549 - Minutes JOG 29 May 2017.pdf
- Agenda JOG 14 Aug 2017_FINAL.pdf
- D0000096 - Recycled water product specifications.docx
- DOC0158 - Notification and Reporting of Material Harm to Regulators.docx
- Email_CO_Draft media release.msg
- Email_CO_SLG Comms protocol and guideline_300517.pdf
- Email_GT_oursydneyourwater microsite_191016.pdf
- Email_JL_fluoride query_140217.pdf
- Email_JL_radionuclide query_300517.pdf
- Email_JL_teas of world video content_270617.pdf
- Final Health SLG minutes 23 September 2016.pdf
- Guidelines for drinking water communications.docx
- Health SLG minutes 13 Dec 2016.pdf
- IMS0152.01 - Drinking Water Product Specifications.docx
- Letter_fluoride enquiry_130217_redacted.docx
- Minutes SLG 17 March 17.pdf.
- SLG Agenda 23 Sept 2016.pdf
- SLG Comms protocol and guidelines_240517.xlsx

Summary of reason for grade

The MoU sets out structures and processes between Sydney Water and NSW Health. The structures include a Strategic Liaison Group (SLG) and a Joint Operational group (JOG). Agendas and minutes of these meetings were provided as evidence in support of these meetings. The MoU also outlines Sydney Water's role and responsibilities. NSW Health noted they "maintain and effective and open relationship with Sydney Water at officer and strategic levels" and that they were satisfied the Sydney Water had met its obligations relevant to water quality under the MoU.

Discussion and notes

The MoU sets the roles and responsibilities around Sydney Water's cooperative relationship with NSW Health. Sydney Water regularly discusses issues and engages with NSW Health on our responsibilities at:

- formal meetings (Joint Operational Group and Strategic Liaison Group quarterly meetings)
- as part of sub-working groups (e.g. 'Improving the monitoring and reporting of drinking water safety' working group, see minutes)
- via the Communications Reference Group established in 2016-17
- via established reporting procedures

- via informal meetings, conversations via phone, email.

Sydney Water provided quarterly progress update to NSW Health and presented to quarterly Joint Operating Group (JOG) meeting with NSW Health.[337]

Sydney Water and NSW Health have exchanged info on public health issues:
- as part of managing events and incidents (see clause 9.1.3 below)
- verifying pre-prepared key messages for events and incidents
- at quarterly JOG and SLG meetings
- as part of producing new campaigns on water quality[338]
- as part of response to customer enquiries on emerging issues (see letters)
- as part of Ministerial briefings

Sydney Water has provided public communications that reference NSW Health and has sought permission for these communications. Examples include:
- new website pages and video on Safe Drinking Water
- letters/enquiries on fluoride
- letter on radiation

Sydney Water has provided public communications that give statements on our products being safe and fit for purpose. In 2016-17 Sydney Water and NSW Health set up a Communications Reference Group to decide when and how Sydney Water is to raise items for NSW Health's review. Key documents for this group are:
- Communications Reference Group Terms of Reference
- guidelines for drinking water communications (internal SW)

Certain pre-approved key messages have been decided for use any time.[339]

Decisions of the Communications Reference Group are recorded in the JOG minutes.[340]

Recommendations

There are no recommendations for this sub-clause.

Opportunities for improvement

There are no opportunities for improvement for this sub-clause.

Table B-31. Clause 9.1.3 compliance grade

Subclause	Requirement	Compliance grade
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.	Full compliance

Risk	Target for full compliance
Non-compliance with this clause poses a high public health risk.	Sydney Water has immediately report any information or event within its area of operations including the Water Supply System, Recycled Water Supply System or wastewater reticulation, treatment and disposal operations which may adversely affect public health

[337] Scheme Risk Assessment Update_JOG 29 May 2017.pdf
[338] Email_JL_teas of world video content_270617.pdf
[339] Guidelines for drinking water communications.docx
[340] 614549 - Minutes JOG 29 May 2017.pdf and 614392 - Agenda JOG 29 May 2017.pdf

Evidence sighted

See evidence for clause 9.1.1.

Summary of reason for grade

Section 11 of the MoU contains requirements for Sydney Water to immediately report any information or event within its area of operations including the Water Supply System, Recycled Water Supply System or wastewater reticulation, treatment and disposal operations which may adversely affect public health. Sydney Water's drinking and recycled water emergency response plans including notifications have been audits as part of clause 2 and these aspects (Element 6 within the appropriate framework) and were found to be fully compliant.

Discussion and notes

Sydney Water has established plans and procedures, that NSW Health have reviewed, that:

- define acceptable water quality criteria which are based on protecting public health (e.g. Drinking Water Specification, Recycled Water Specification);
- define what constitutes a potential event or incident and define how we notify these events to NSW Health (e.g. Drinking Water Event Management Plan, Recycled Water Event Management Plan, Notification and Reporting of Material Harm to Regulators)

Sydney Water reports any event with the potential to impact public health. Reports may be in form of:

- Sydney Water Incident Recording and Learnings (SWIRL) notifications
- notifications under the POEO Act
- verbal reports
- situation reports

Sydney Water maintain a spreadsheet of key messages for use in preparation of media releases and briefings during incidents has been developed for use by Sydney Water, WaterNSW and NSW Health.[341]

Recommendations

There are no recommendations for this sub clause.

Opportunities for improvement

There are no opportunities for improvement for this sub clause.

[341] SLG Comms protocol and guidelines_240517.xlsx

Clause 9.2 – Environment Protection Authority

Table B-32. Clause 9.2.1 compliance grade

Subclause	Requirement	Compliance grade
9.2.1	Sydney Water must maintain the memorandum of understanding with the Environment Protection Authority entered into under section 35 of the Act.	Full compliance

Risk	Target for full compliance
Without an MOU being maintained roles and responsibilities are unclear. Non-compliance with this clause posed a medium operational risk.	Evidence that Sydney Water has maintained the memorandum of understanding with the Environment Protection Authority

Evidence sighted

- Shared Drive - JOG Minutes Aug 2016.pdf
- Shared Drive - JOG Minutes Feb 2017.pdf
- Shared Drive - JOG Minutes May 2017.pdf
- Shared Drive - JOG Minutes Nov 2016.pdf
- Shared Drive - JOG Project-Conc Limits.pdf
- Shared Drive - JOG Project-HN nutrients.pdf
- Shared Drive - JOG Project-Stormwater source control.pdf
- Shared Drive - JOG Project-WWOA.pdf
- Shared Drive - SLG 1 Dec 2016 Strategic water issues pres.pptx
- Shared Drive - SLG Minutes 14 Sept 2016.pdf
- Shared Drive - SLG minutes 28 Feb 2017.pdf
- Shared Drive_SLG Minutes 1 Dec 2016.pdf.

Summary of reason for grade

The MOU sets out structures including CEO meeting, a Strategic Liaison Group (SLG), a Joint Operational Group (JOG) and processes including joint forums, programs and initiative and exchange of information and data. Sydney Water provided evidence including agenda and meeting minutes that demonstrated the groups has meet are required and covered the issues within the scope of the MoU.

Discussion and notes

Three combined CEO/SLG meetings were held on 14th September 2016, 1st December 2016 and 28th February 2017. An additional meeting was planned for 17th May 2017 but was cancelled because the EPA CEO was unable to attend.

In September, the SLG:

- discussed strategic water planning issues focussing on the potential impacts from growth on the Hawkesbury Nepean River and the benefits of total catchment management to prevent or mitigate these impacts
- reviewed and endorsed the JOG 2016–17 Work Plan
- discussed how to improve the effectiveness of future SLG meetings.

In December, the SLG:

- continued discussions on strategic water planning with a focus on how to implement integrated water cycle management. It was agreed that Sydney Water's MD and the EPA's CEO would meet with GSC commissioners to consider how IWCM can be implemented through the Greater Sydney District Plans. This meeting occurred in late December 2016,
- reviewed of the initial work on the Hawkesbury Nepean Nutrients Regulatory Framework and the implications for the long-term protection of the river,

- discussed updates on the EPA's reviews of Load Based Licensing and the NSW Biosolids Guidelines.

During the audit interview the establishment of a Strategic Collaboration Group was discussed. The intention of this group will be to deal with tactical issues to keep the CEO/SLG meeting at the appropriate level.

In February, the SLG:

- held a workshop for the strategic review of the SLG relationship
- discussed the results of the risk assessment of the Vaucluse and Diamond Bay outfalls
- received updates of the wet weather overflow abatement and Hawkesbury Nepean nutrients regulatory framework projects
- continued discussions on strategic water planning, focussing on preparing a leadership paper to inform/influence discussions with broader government.

The JOG met four times during the audit scope period; 31st August 2016, 29th November 2016, 15th February 2017, and 31st May 2017.[342] JOG meetings included updates on regular items (JOG work program progress, Licence variations and any issues, Pollution Reduction Programs update, Beachwatch /Harbourwatch reports) and other issues as identified by all parties.[342]

Recommendations

There are no recommendations for this clause.

Opportunities for improvement

There are no opportunities for improvement for this clause.

[342] 614549 - Minutes JOG 29 May 2017.pdf and 614392 - Agenda JOG 29 May 2017.pdf

Clause 9.3 – Water Administration Ministerial Corporation

Table B-33. Clause 9.3.1 compliance grade

Subclause	Requirement	Compliance grade
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.	Full compliance

Risk	Target for full compliance
Without an MOU being maintained roles and responsibilities are unclear. Non-compliance with the clause during the audit period posed a low operational risk.	Evidence that Sydney Water has maintained the memorandum of understanding with the Water Administration Ministerial Corporation

Evidence sighted

- DPI Water-SW Correspondence 22 June 2016.pdf
- Memorandum of Understanding (MoU) with WAMC _Folio 2016-17.pdf
- SW-DPI Water Correspondence 3-4 May 2016.pdf
- Memorandum of Understanding between Sydney Water Corporation and the Water Administration Ministerial Corporation

Summary of reason for grade

Sydney Water has maintained the memorandum of understanding with the Water Administration Ministerial Corporation. This MoU sets out function sand objectives of the parties including a consultation process where the parties may liaise and keep each other informed however there is no obligation for regular meetings.

Discussion and notes

Communication with DPI Water during the audit period was focused on renewing the MoU. Proposed MoU changes were made in November 2015 due to a name change in NSW Office of Water to Department of Primary Industries Water. The document has been with DPI Water until June 2017. Sydney Water received an updated copy from DPI Water on 22 June, which is now in the process of being approved after legal review.

DPI Water was contacted to comment on the audit. In their response they noted the request to review to MoU was focussed on administrative changes.

Recommendations

There are no recommendations for this clause.

Opportunities for improvement

There are no opportunities for improvement for this clause.

D Sydney Water's statement of compliance

Sydney WATER

Statement of Compliance 2017
For 2016-17
Submitted by Sydney Water Corporation
ABN: 49 776 225 038

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 2016-17 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 to the best of our knowledge of conditions to which it is subject under the Sydney Water's Operating Licence and Reporting Manual.
3. Schedule A provides information on all obligations with which Sydney Water did not comply during 2016-17.
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 Managing Director and the Chairman of the Board of Directors of Sydney Water.

DATE: 24/8/17

Signed: .....
Name: Kevin Young
Designation: Managing Director

DATE: 24/8/17

Signed: .....
Name: Bruce Morgan
Designation: Chairman

Schedule A Non Compliances 2016-17

List obligations breached, including a brief description of each obligation

1.9 Pricing

Sydney Water must set the level of fees, charges, and other amounts payable for its Services subject to the terms of the Operating Licence, the *Sydney Water Act 1994* (the SW Act) and the maximum prices and methodologies for fixing maximum prices determined from time to time by IPART under the *Independent Pricing and Regulatory Tribunal Act 1992* (the IPART Act).

Under section 18 of the IPART Act, Sydney Water is only able to levy a charge that is lower than a determined price with approval from the Treasurer.

i Date or period of non-compliance (including whether and how many customers have been affected)

1.9 Pricing – Substance charges for commercial customers

From 1 July 2012 to present, Sydney Water's commercial trade waste customers have been charged an incorrect (lower) price for substance charges than the determined price.

No customers were adversely affected as the nature of the non-compliance meant that prices were effectively rounded down. This resulted in an under-recovery of revenue for Sydney Water of $160,653 over the five years from 2012-13 to 2016-17. The amount per year varied, in accordance with the total amount of substance charges for commercial customers levied.

ii Nature and extent of non-compliance

IPART released the Determination No. 5, 2016 *Maximum prices for Sydney Water Corporation's water, sewerage, stormwater drainage and other services* (the 2016 Determination) in June 2016. The 2016 Determination sets the unit price for substance charges for commercial customers (trade waste customers) to three decimal places.

In 2016-17, Sydney Water truncated the unit price for substance charges for commercial customers to two decimal places (effectively rounding down the price). This was in line with business practice since 2012, when substance charges for commercial customers were first introduced to three decimal places. Prior to 2012, these charges were set to two decimal places only.

As a result, Sydney Water levied charges to these customers at a rate that was lower than the maximum price without approval from the Treasurer. This is a non-compliance against section 18 of the IPART Act, and, therefore, clause 1.9 of the Operating Licence.

The non-compliance is limited to substance charges for commercial customers only. Substance charges for industrial customers have always been charged to three decimal places and Sydney Water's billing system includes three decimal places in the relevant data field for industrial charges.

iii Results of any monitoring (where applicable)

N/A

iv Reasons for non-compliance

The unit prices were truncated from three decimal places as Sydney Water's billing system is configured with only two decimal places in the relevant data field for commercial charges.

The error was identified by Sydney Water staff during the process of updating our system with prices for 2016-17. Staff were alerted to the error while investigating how to apply IPART's new rule regarding rounding (Schedule 9, clause 2.4 of the determination).

v Remedial action taken

Sydney Water is making changes to our billing system to accommodate three decimal places for substance charges for commercial customers.

We are notifying IPART of the error and will report the non-compliance for the 2016-17 period in our 2016-17 Annual Report.

vi Actual/anticipated date of full compliance

Sydney Water is making the required billing system changes within the first quarter of 2017-18. However, due to the time needed to make the changes, this will not be completed in time for the first billing period of 2017-18. The changes are currently underway and are expected to be completed in time for the second billing period of 2017-18, effective from 1 October 2017. This will result in a non-compliance for 2017-18.

Schedule A Non Compliances 2016-17

List obligations breached, including a brief description of each obligation

1.9 Pricing

Sydney Water must set the level of fees, charges, and other amounts payable for its Services subject to the terms of the Operating Licence, the *Sydney Water Act 1994* (the SW Act) and the maximum prices and methodologies for fixing maximum prices determined from time to time by IPART under the *Independent Pricing and Regulatory Tribunal Act 1992* (the IPART Act).

i Date or period of non-compliance (including whether and how many customers have been affected)

1.9 Pricing – Asset construction details

Between 7 July – 1 September 2016, 43 customers who requested asset construction details were unintentionally overcharged by 60 cents per plan. This equated to $261.60 in total.

ii Nature and extent of non-compliance

Customers who requested asset construction details between 7 July and 1 September 2016 were unintentionally charged $45.29 rather than the IPART determined price of $44.69 resulting an overcharge of 60 cents per plan .

This is a breach of section 18 of the IPART Act as we charged above the maximum price set by IPART, which results in an Operating Licence non-compliance against clause 1.9.

iii Results of any monitoring (where applicable)

N/A

iv Reasons for non-compliance

During the annual CPI update of Sydney Water's database that contains these charges, the price for providing building over asset details ($45.29) was mistakenly entered as the price for providing asset construction details ($44.69). Prior to 1 July 2016, the price for both services was the same.

This slightly higher charge was applied to all requests for asset construction details until the mistake was proactively identified by a Sydney Water staff member.

v Remedial action taken

Once aware of the error, we adjusted our systems to reflect the correct price. Sydney Water also checked all other ancillary charges to confirm that they were in accordance with determined prices. No other errors were found. It appears that this was a one-off transposition error.

Sydney Water notified IPART in March 2017 of the error and will report the non-compliance in our 2016-17 Annual Report.

At the time of writing, we are still in the process of refunding the overcharged amounts. Sydney Water has sent all affected customers a reimbursement form offering a refund. Twenty-three customers who were overcharged have returned this form to us and have been reimbursed. Sydney Water is still waiting to hear from the remaining twenty customers.

vi Actual/anticipated date of full compliance

From 2 September 2016, Sydney Water applied the correct determined price for requests for asset construction details, rectifying the non-compliance.

Schedule A Non Compliances 2016-17

List obligations breached, including a brief description of each obligation

1.9 Pricing

Sydney Water must set the level of fees, charges, and other amounts payable for its Services subject to the terms of the Operating Licence, the Sydney Water Act 1994 (the SW Act) and the maximum prices and methodologies for fixing maximum prices determined from time to time by IPART under the Independent Pricing and Regulatory Tribunal Act 1992 (the IPART Act).

i Date or period of non-compliance (including whether and how many customers have been affected)

1.9 Pricing – Hoxton Park recycled water scheme

Sydney Water had an ongoing non-compliance between 2007 to 2016 for charges for the Hoxton Park recycled water scheme. This continued until a Development Servicing Plan (DSP) was registered for the scheme and all outstanding Notices of Compliance including non-compliant capital contributions were re-issued. This occurred on 15 November 2016.

No customers were affected by the non-compliance, as the compliant charge under the registered DSP was set at the same level as non-compliant capital contributions, following Treasurer approval (see section ii for more detail).

ii Nature and extent of non-compliance

Sydney Water did not comply with IPART's *Recycled water developer charges, Determination No.8, 2006* (the 2006 Determination) which sets a methodology for fixing the maximum prices that a Water Agency may charge for Recycled Water Developer Charges. As part of this methodology, Sydney Water must register a Development Servicing Plan (DSP) for any recycled water scheme where we wish to levy a developer charge.

In 2016–17, some recycled water capital contributions levied by Sydney Water for the Hoxton Park recycled water scheme were not based on the methodology stipulated in the 2006 Determination. This occurred during the process of Sydney Water seeking to complete, register and apply the DSP for the scheme. The DSP was registered by IPART and was effective from 29 August 2016.

The non-compliant charges were less than the maximum price that would have been determined by the methodology in the 2006 Determination. Sydney Water did not obtain approval from the Treasurer for these charges to be below the amount determined by the methodology.

Therefore, Sydney Water was non-compliant with Clause 1.9 of our Operating Licence and section 18(2) of the IPART Act in respect of these charges. Sydney Water will report this in our 2016-17 Annual Report.

iii Results of any monitoring (where applicable)

N/A

iv Reasons for non-compliance

The non-compliance resulted from actions and decisions taken by Sydney Water's previous administration. At the time, Sydney Water's view was that we could levy capital contributions without preparing a DSP for this scheme.

In March 2015, IPART notified Sydney Water that this view was incorrect and that we had failed to:

- prepare and register a DSP before levying developer charges (in accordance with the requirements of the 2006 Determination);
- seek the Treasurer's approval before fixing a price that was below the maximum price that would have been determined by the methodology set out in the 2006 Determination (in accordance with s18(2) of the IPART Act); and
- report on our non-compliance with price determinations in our annual report (in accordance with s18(4) of the IPART Act).

v Remedial action taken

Sydney Water has now rectified the non-compliance on pricing with regard to the Hoxton Park recycled water scheme.

Sydney Water prepared a draft DSP for the scheme, and publicly exhibited this in June 2016 in accordance with the 2006 Determination. In that draft DSP, Sydney Water sought to set a developer charge for Hoxton Park below that calculated in accordance with the 2006 Determination. Sydney Water had obtained approval from the NSW Treasurer to set this lower developer charge, in accordance with clause 18(2) of the IPART Act. Sydney Water did this to ensure that we set a charge that was the lowest cost to society to meet the requirements of the NSW Government's BASIX program. The final DSP was then registered by IPART and was effective from 29 August 2016. This action was in accordance with the 2014-15 operational audit recommendation and subsequent ministerial requirement to develop, register and apply a DSP for the Hoxton Park scheme by 30 June 2016.

Sydney Water has now reissued all outstanding Notice of Requirements so that they contain a compliant developer charge.

Sydney Water reported this non-compliance in our 2014-15 and 2015-16 Annual Reports. We will report on the non-compliance that occurred during 2016-17 in our 2016-17 Annual Report.

vi Actual/anticipated date of full compliance

A DSP for the Hoxton Park recycled water scheme is now in place, effective from 29 August 2016, rectifying the pricing non-compliance for this scheme.

Schedule A Non Compliances 2016-17

List obligations breached, including a brief description of each obligation

1.9 Pricing

Sydney Water must set the level of fees, charges, and other amounts payable for its Services subject to the terms of the Operating Licence, the Sydney Water Act 1994 (the SW Act) and the maximum prices and methodologies for fixing maximum prices determined from time to time by IPART under the Independent Pricing and Regulatory Tribunal Act 1992 (the IPART Act).

i Date or period of non-compliance (including whether and how many customers have been affected)

1.9 Pricing – Oran Park/Turner Road recycled water scheme

Capital contributions levied by Sydney Water for the Oran Park/Turner Road recycled water scheme did not comply with IPART's *Recycled water developer charges, Determination No.8, 2006* between 2009 and 2017.

No customers were affected by the non-compliance, as the compliant charge under the registered Development Servicing Plan (DSP) was set at the same level as non-compliant capital contributions, following Treasurer approval (see section ii for more detail).

ii Nature and extent of non-compliance

Sydney Water has not complied with IPART's *Recycled water developer charges, Determination No.8, 2006* (the 2006 Determination) which sets a methodology for fixing the maximum prices that a Water Agency may charge for Recycled Water Developer Charges. As part of this methodology, Sydney Water must register a Development Servicing Plan (DSP) for any recycled water scheme where we wish to levy a developer charge.
Up to and including in 2016–17, Sydney Water collected non-compliant capital contributions for the Oran Park/Turner Road scheme without a registered DSP in place.

The non-compliant charges were very likely less than the maximum price that would have been determined by the methodology in the 2006 Determination. Sydney Water did not obtain approval from the Treasurer for these capital contribution charges to be below the amount determined by the methodology.

Therefore, Sydney Water was non-compliant with Clause 1.9 of our Operating Licence and section 18(2) of the IPART Act in respect of these charges.

iii Results of any monitoring (where applicable)

N/A

iv Reasons for non-compliance

The non-compliance resulted from actions and decisions taken by Sydney Water's previous administration.

At the time, Sydney Water's view was that it could levy capital contributions without preparing a DSP for this scheme. In March 2015, IPART notified Sydney Water that this view was incorrect and that we had failed to:

- prepare and register a DSP before levying developer charges (in accordance with the requirements of the 2006 Determination);

- seek the Treasurer's approval before fixing a price that was below the maximum price that would have been determined by the methodology set out in the 2006 Determination (in accordance with s18(2) of the IPART Act); and
- report on our non-compliance with price determinations in our annual report (in accordance with s18(4) of the IPART Act).

As noted in previous audits, we originally believed this non-compliance to be historical only, as the majority of development had already occurred in the area. In 2015-16, we became aware that non-compliant capital contributions were still being raised for the small number of lots not yet developed, and that they could potentially be raised for future sub-divisions, etc. Sydney Water proactively reported this in the 2015-16 audit and then took steps to limit the non-compliance as much as possible by preparing a DSP.

v Remedial action taken

Sydney Water has now rectified the non-compliance on pricing with regard to the Oran Park/Turner Road recycled water scheme.

Sydney Water prepared a draft DSP for the scheme, and publicly exhibited this in May 2017 in accordance with the 2006 Determination. In that draft DSP, Sydney Water sought to set a developer charge for the Oran Park/Turner Road scheme below that calculated in accordance with the 2006 Determination. Sydney Water obtained approval from the NSW Treasurer to set this lower developer charge, in accordance with clause 18(2) of the IPART Act. Sydney Water did this to ensure that we set a charge that was the lowest cost to society to meet the requirements of the NSW Government's BASIX program. The final DSP was then registered by IPART and was effective from 28 June 2017. This action was in accordance with the 2015-16 operational audit recommendation and subsequent ministerial requirement to develop, register and apply a DSP for the Oran Park/Turner Road scheme by 30 June 2017.

Sydney Water also chose to voluntarily prepare a DSP for the Colebee scheme, in order to avoid the potential for future non-compliant charges in the case of future sub-division or re-development in this area.

Sydney Water reported the non-compliance for the 2015-16 period in our 2015-16 Annual Report. The non-compliance for the 2016-17 period will be included in our 2016-17 Annual Report.

vi Actual/anticipated date of full compliance

Sydney Water became compliant with the pricing requirements for the Oran Park/Turner Road scheme from 28 June 2017, when the DSP became effective.

Schedule A Non Compliances 2016-17

List obligations breached, including a brief description of each obligation

8.2 Reporting

Clause 8.2.1 (a) of the Operating Licence requires that:
'Sydney Water must comply with its reporting obligations set out in the Reporting Manual, which include: reporting to IPART and NSW Health in accordance with the Reporting Manual'.

Section 2.2.1 of the Reporting Manual requires that:
'Sydney Water must prepare, for each financial year, compliance and performance report on its management of the quality of Drinking Water and Recycled Water. Sydney Water must submit the compliance and performance report to IPART and NSW Health by 1 September following the end of the relevant financial year, or at a later date agreed to by IPART'.

i Date or period of non-compliance (including whether and how many customers have been affected)

The period of non-compliance was from 1 September 2016 to 23 January 2017. No customers were affected by the non-compliance.

ii Nature and extent of non-compliance

The non-compliance is of a technical nature, related to a reporting deadline to NSW Health being missed.

Sydney Water provided the 2015-16 Annual Compliance and Performance reports for the Drinking Water Quality Management System and Recycled Water Quality Management System to IPART by 1 September 2016 (as required by the Reporting Manual), however due to an oversight the reports were not provided to NSW Health until 23 January 2017.

The non-compliance had no material impact as NSW Health receives regular information on the performance of Sydney Water's drinking water and recycled water quality management systems through various other means including quarterly water quality monitoring reports, daily drinking water reporting on the Sydney Water website, the incident reporting system (SWIRL), regular communication at officer level and via the Joint Operations Group (JOG) and Strategic Liaison Group (SLG) established under the Memorandum of Understanding between the two agencies.

iii Results of any monitoring (where applicable)

N/A

iv Reasons for non-compliance

The non-compliance occurred due to an oversight in the reporting process. Sydney Water became aware of the oversight when reviewing the internal Folios of Progress as part of our mid-year compliance monitoring process and the reports were subsequently provided to NSW Health on 23 January 2017.

v Remedial action taken

To prevent a recurrence of this issue, Sydney Water has documented a formal work instruction for the compilation and delivery of the Drinking Water and Recycled Water compliance reports required by the Operating Licence (SDIMS Work Instruction for Annual DWMS & RWMS Compliance and Performance Reports for IPART). The work instruction specifies the reporting requirements and the accountabilities for sending the reports to NSW Health by 1 September.

vi Actual/anticipated date of full compliance

Sydney Water submitted the compliance and performance reports to NSW Health on 23 January 2017 to rectify the non-compliance.