

Independent Pricing and Regulatory Tribunal

## Sydney Water Corporation Operational Audit 2010/11

Report to the Minister

Water — Compliance Report November 2011



Independent Pricing and Regulatory Tribunal

# Sydney Water Corporation Operational Audit 2010/11

### **Report to the Minister**

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### **Executive Summary**

The Independent Pricing and Regulatory Tribunal of New South Wales (IPART) has completed the audit of Sydney Water Corporation's (Sydney Water) compliance with the requirements of its 2010 to 2015 operating licence (the licence). This audit covers the period from 1 July 2010 to 30 June 2011. IPART engaged t-cAM Consulting (t-cAM) and Cardno Pty. Ltd (Cardno) as consultants to assist with the 2010/11 operational audit and asset management audit of Sydney Water.

### **Overview of audit findings**

Historically Sydney Water has achieved an excellent level of compliance with its operating licence. This performance is reflected in its annual operating licence audit grades (see section 3 of this report for an overview of its historical compliance). The compliance history shows that Sydney Water continues to deliver excellent service and is a leading water utility in Australia.

This year Sydney Water demonstrated that it continues to manage its resources and operations to an excellent standard. The auditor awarded full compliance for all but 1 clause audited this year.

In summary, for the audited clauses, we found that Sydney Water achieved:

- High to full compliance with requirements relating to water quality.
- ▼ Full compliance with its requirements relating to infrastructure performance. This included meeting all system performance standards for water continuity, water pressure and sewer overflows.
- Full compliance with all requirements relating to customer and consumer rights.
- Full compliance with its obligations relating to complaints and dispute handling.
- ▼ Full compliance with environment indicators and management.
- ▼ Full compliance with requirements relating to water conservation.
- ▼ Full compliance with requirements relating to reporting and records management.
- Full compliance with requests for information and access.
- Full compliance relating to memoranda of understanding.

Sydney Water's compliance with audited licence clauses for the audit period is illustrated in the following table.

Licence Clause	ce Clause No of Compliance		e Grade Awarded	
	Auditable Obligations	Full	High	
Part 2 – Water quality	10	9	1	
Part 3 – Infrastructure Performance	22	22		
Part 4 – Customer and consumer right	15	15		
Part 5 – Complaint and dispute handling	7	7		
Part 6 – Environment – indicators and management	5	5		
Part 7 – Water conservation	14	14		
Part 9 – Reporting and maintaining records	3	3		
Part 10 – Request for information and access	4	4		
Part 11 – Memoranda of understanding	2	2		
Total	82	81	1	

 Table 1
 Summary of Sydney Water's 2010/11 compliance

Sydney Water has fully addressed all recommendations arising from the previous 2009/10 operational audit. A copy of the auditors' reports form Appendix A and B.

### **IPART's Recommendations**

The auditor has made recommendations relating to a minor breach of the licence in the area of water quality.

The recommendations aim to protect drinking water quality in accordance with the multi barrier approach set out in the ADWG. While there is no evidence that existing water quality has been compromised, the recommendations identify gaps in existing processes and procedures which, given a combination of circumstances, could result in water quality incidents. The auditor has therefore suggested amendments to existing inspection and maintenance procedures, processes, criteria and timeframes to minimise the risks identified.

We support the auditor's recommendations, however we think it is appropriate to make strategic level recommendations which allow Sydney Water to determine the most efficient and effective methods to meet the desired outcome. As a result we recommend that Sydney Water:

#### **IPART's Key Recommendations**

1 Review the criteria used to define adequate integrity of storage tanks and reservoirs to ensure that there is no entry of vermin or birds and no unacceptable water ingress into these tanks. Sydney Water should then validate the inspection regimes and amend maintenance procedures to inspect and maintain tanks in the future to ensure the tanks meet the revised criteria.

2 Conduct an audit of the water reservoir tanks to identify tanks which do not have sufficient preventive measures. By 30 June 2012, establish a remediation timetable to rectify any faults found.

The auditor has also identified some opportunities where compliance with the licence could be enhanced, or where Sydney Water's practices and procedures could be improved (for a full list of these recommendations which we support as opportunities for improvement see Appendix C). Sydney Water will be requested to consider the benefits of implementing the opportunities for improvement and to provide us with a status report before 31 March 2012 indicating what actions they have taken in respect to these matters.

The March 2012 status report will also set out the actions and timelines to address IPART's key recommendations. Further, we will review Sydney Water's progress in addressing the key recommendations as part of the 2011/12 operational audit.

### 1 Introduction

Sydney Water is a State Owned Corporation (SOC) wholly owned by the NSW Government. Its primary role is to manage potable water supply and wastewater systems to protect public health and the environment for the benefit of Sydney, Illawarra and the Blue Mountains. These roles and responsibilities, as well as Sydney Water's objectives, are prescribed by the *State Owned Corporations Act 1989*, the *Sydney Water Act 1994* (the Act) and the operating licence issued to Sydney Water under Part 5 of the Act.

We conduct annual operating audits to monitor Sydney Water's compliance with its licence obligations. A risk based approach has been adopted for auditing. The risk-based auditing process assesses the risk associated with non-compliance of a licence obligation. Those clauses deemed as 'high risk' are audited more frequently. Higher risk clauses include those relating to water quality, infrastructure and the environment. Other clauses, such as those dealing with customer contracts, have been assessed as low risk and are therefore audited less frequently.

The adoption of the risk-based approach improves the effectiveness and efficiency of the auditing process without increasing the risks to the community. It allows audit resources to be targeted to areas of higher risk while reducing the overall burden of compliance.

All requirements of the licence are audited at least once during the 5-year term of the licence. The 2010/11 audit is the first audit of compliance with this new 2010 to 2015 licence. As such all clauses were audited for compliance to ensure the new licence was being implemented. The audit was separated into 2 audits, the Operating Licence Audit and the Asset Management Audit. This was done as it coincided with IPART's review of Sydney Water's prices.

#### Purpose and structure of this report

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

- Chapter 1 explains the scope of the audit review, and the process followed in undertaking the audit.
- Chapter 2 presents a summary of the audit findings and recommendations.
- Chapter 3 summarises the progress by Sydney Water to address and implement recommendations from previous audits.

#### Audit scope

This audit covers the period from 1 July 2010 to 30 June 2011. The 2010/11 audit scope required a review of the following sections of the licence:

- Water Quality (section 2) obligations relating to planning, monitoring, reporting, incident management and wastewater and water recycling operations.
- ▼ Infrastructure Performance (section 3) asset management obligation and compliance with and reporting of system performance standards and indicators.
- Customer and Consumer Rights (section 4) obligations relating to the customer service indicators.
- Compliant and Dispute Handling (section 5) obligations in establishing and maintaining dispute resolution and complaints handling processes, as well as its complaints reporting obligations.
- Environment Indicators and Management (section 6) monitoring and reporting obligations with respect to environmental performance indicators, environment management and catchment activities.
- Water conservation (section 7) water conservation and demand management strategy.
- Reporting and maintaining records (section 9) reporting manual obligations, including provision of information and maintenance of records to ensure accuracy and timeliness of information provision.
- Requests for information and access (section 10) obligations relating to providing information and access to sources of information when requested by IPART or NSW Health.
- Memoranda of Understanding (section 11) obligations to maintain MOUs with NSW Health, NSW Office of Water and Office of Environment and Heritage.

### The audit process

The 2010/11 Sydney Water operating licence audit was split into 2 parts. The annual operating licence audit was undertaken by t-cAM Consulting, in conjunction with Water Futures and iConnexx, (t-cAM).

The asset management obligations (clause 3.1 & 3.2) were not part of the operating licence audit. Instead they were combined with the review of Sydney Water's operating and capital expenditure to assist IPART in its determination of Sydney Water's prices. This audit was undertaken by Cardno in association with WS Atkins International. The purpose of this audit was to assess the measures taken by Sydney Water for the proper management of assets in the provision and operation of services. The audit provided an independent report on the robustness of Sydney Water's processes, systems and plans to meet the licence obligations.

The auditors were required to undertake the following tasks:

- 1. liaise with NSW Health to obtain that agency's views on Sydney Water's licence compliance and whether any licence obligations should receive special focus as part of the audit (Cardno were not required to undertake this step)
- 2. prepare an information request (questionnaire) for Sydney Water setting out all information requirements prior to the audit interviews
- 3. assess the level of compliance achieved by Sydney Water against each of the obligations of the licence set out in IPART's risk-based audit scope, providing supporting evidence for this assessment and reporting compliance according to IPART's established compliance scoring methodology
- 4. assess and report on progress by Sydney Water in addressing any comments made by the relevant Minister and/or recommendations endorsed by IPART pertaining to previous audits, providing supporting evidence for these assessments
- 5. verify the calculation of performance indicators associated with requirements of the relevant operating licence and undertake an assessment of any underlying trends in performance arising from these indicators
- 6. provide drafts of the audit report to IPART and seek and address comments from Sydney Water and IPART regarding the draft audit findings
- 7. prepare a final report on the findings of the audit.

As part of the audit process, we sought submissions from the public on any matter related to the operating licences prior to commencement of the audit interviews. We advertised for public submissions in the Sydney Morning Herald, Daily Telegraph, Newcastle Herald and The Land on 3 August 2011. We did not receive any submissions from the public.

t-cAM held a phone conference with NSW Health prior to the audit interview. The auditor also consulted NSW Health about the findings of the audit. NSW Health confirmed it was satisfied with the consultation through the audit and accepted the findings of the report as the independent auditor's findings.

The auditors adopted an audit methodology consistent with ISO 14011 "Guidelines for Environmental Auditing" for both audits. These guidelines set out a systematic approach to defining the requirements of the audit ensuring that it is conducted in accordance with an established and recognised audit protocol.

We held an inception meeting for the asset management audit with Cardno and Sydney Water on 2 August and then an inception meeting with t-cAM and Sydney Water on 14 September for the operating licence audit. At these meetings a mutual understanding and expectations of the requirements of the audits were established and protocols for the conduct of the audits were also set out. All parties adhered to the agreed protocols throughout the audits.

The operating licence audit interviews were conducted on the 14 to 16 September 2011, the asset management audit was conducted on the 20 to 22 September 2011, at Sydney Water's offices. Field visits were also undertaken as part of the operating licence audit process.

Sydney Water's compliance with the relevant requirements of the operating licence was assessed according to the compliance grades outlined in chapter 1 of the t-cAM report (Appendix A) and the opening section of the Cardno report (Appendix B).

### 2 Overview of audit findings and recommendations

Presented below is a summary of the auditor's findings and recommendations for each of the audited clauses and sub-clauses of the licence.

Direct comparison of performance in previous years is not possible for this year's audit, as this is the first year of its new operating licence and licence conditions have changed significantly making comparisons difficult. However, Sydney Water had outstanding performance under the previous licence, achieving primarily full compliance across the previous 5-year licence term.

In the following sections we discuss those clauses where Sydney Water received less than full compliance and the auditor's reasoning for the grade. Finally we outline the recommendations to address the issues that have resulted in less than full compliance that we support.

### **Water Quality**

Part 2 of the licence outlines the obligations for managing water quality. It includes requirements relating to planning, monitoring, reporting and incident management in accordance with the Australian Drinking Water Guidelines ADWG. Part 2 also includes obligations dealing with water recycling. Under the risk-based auditing framework, we consider this section of the licence to be one that poses a high risk in terms of the likelihood and consequence of non-compliance with licence obligations.

The auditor found Sydney Water continued to deliver drinking water of an excellent standard to its customers throughout 2010/11. Sydney Water achieved full compliance with 9 out of the 10 audited sub-clauses associated with water quality. High compliance was awarded for the remaining drinking water clause.

The auditor (t-cAM) commented that the drinking water quality supplied is generally of an excellent standard and complies with the majority of the requirements of the ADWG and the requirements of NSW Health.

The high compliance relates to the integrity of drinking water storages against potential ingress of birds and vermin and untreated roof runoff. On physical inspection the auditor saw no evidence of vermin ingress but noted deficiencies in physical barriers. This issue should be addressed. We support the auditor's recommendations, however we think it is appropriate to make strategic level recommendations which allow Sydney Water to determine the most efficient and effective methods to meet the desired outcome. However, we have retained the specific details of the auditor's recommendations as opportunities for improvement listed in Appendix C.

We consider the following as IPART's key recommendations which will be subject to further reporting and auditing next year.

IPART's Key Recommendations

- 1 Review the criteria used to define adequate integrity of storage tanks and reservoirs to ensure that there is no entry of vermin or birds and no unacceptable water ingress into these tanks. Sydney Water should then validate the inspection regimes and amend maintenance procedures to inspect and maintain tanks in the future to ensure the tanks meet the revised criteria.
- 2 Conduct an audit of the water reservoir tanks to identify tanks which do not have sufficient preventive measures. By 30 June 2012, establish a remediation timetable to rectify any faults found.

#### Infrastructure Performance

Part 3 of the licence outlines the asset management framework, as well as system performance standards (for water continuity, water pressure and sewage overflows) and the Priority Sewerage Program. Under the risk based auditing framework, we consider this section of the licence to be one that poses a high risk in terms of the likelihood and consequence of non-compliance.

The audit was separated into 2 audits, the operating licence audit and the asset management audit. This was done as it coincided with IPART's review of Sydney Water's prices. Clauses 3.1 and 3.2 were audited by Cardno who were involved in expenditure review, while the remainder of the clause was audited by t-cAM.

Cardno found that Sydney Water's management practices, systems and documentation is well developed and shows they have been refined over many years. The organisation has shown a comprehensive understanding of asset management, and commitment to continuous improvement.

t-cAM found that Sydney Water's compliance with the remaining clauses of this section of the licence has improved over the last 5 years. Historical performance trends show that Sydney Water's improvement programs are proving successful in improving services to customers.

Full compliance was awarded to all clauses. Refer to Appendix B for full details of the auditor's findings in regards to clause 3.1 and 3.2 and Appendix A for details on clause 3.3-3.6.

#### **Customer and Consumer rights**

Part 4 of the licence deals with the customer contract, the code of practice on debt and disconnection and the Customer Council. It also includes requirements for measuring and reporting of customer service indicators. We consider that many parts of this section of the licence pose a low to moderate risk in terms of the likelihood and consequence of non-compliance and, as such, the clauses do not warrant audit every year.

Sydney Water has shown excellent organisation within the contact centre, and that all policies and procedures are comprehensive and readily accessible by the public.

Sydney Water achieved full compliance with this clause.

### **Complaints and dispute handling**

Part 5 of the licence deals with the Sydney Water's internal and external dispute resolution processes. It also outlines obligations relating to customer complaints made about Sydney Water to other bodies. We consider that this section of the licence poses a low to moderate risk in terms of the likelihood and consequence of non-compliance and, as such, the clauses do not warrant audit every year.

Sydney Water has shown commitment to customer issues, and is clearly aware of their obligations in regards to customer hardship and water efficiency within the community. Sydney Water has detailed, policed and well developed training programs.

Sydney Water achieved full compliance with this clause.

#### **Environment – indicators and management**

Part 6 of the licence outlines the monitoring and reporting obligations for the environmental performance indicators and environment management. We consider this section of the licence to be one that poses a moderate risk in terms of the likelihood and consequence of non-compliance and, as such, does not warrant audit every year.

Sydney Water has maintained a very high standard of environmental management over the audit period. Sydney Water has procedures which facilitate internal and external management of any environmental issues that arise.

Sydney Water achieved full compliance with this clause.

### **Water Conservation**

Part 7 of the licence details a specified water usage level and outlines Sydney Water's obligations regarding reporting on initiatives to promote water conservation activities. We consider non-compliance with elements of this part of the licence would constitute a moderate risk in terms of meeting the water needs of Sydney Water's customers.

Sydney Water has shown ongoing commitment to water conservation over the audit period. Many of Sydney Water's water conservation programs have been operating for up to 15 years, with proven water efficiency results.

Sydney Water achieved full compliance with this clause.

### **Reporting and Maintaining Records**

Part 9 of the licence outlines Sydney Water's obligations regarding reporting in accordance with the reporting manual to IPART and NSW Health. We consider this section of the licence to be one that poses a moderate risk in terms of the likelihood of non-compliance and, as such, the clause does not warrant audit every year.

This was the first year that Sydney Water has been required to report in accordance with the Reporting Manual. No issues were identified during the audit.

Sydney Water achieved full compliance with this clause.

After the completion of the audit interviews, Sydney Water identified some calculation errors in performance indicators reported to IPART. Sydney Water fixed the errors and explained the nature of the errors. We do not think the errors are significant or display a deficiency in Sydney Water undertaking its core business. However, we will ensure this clause is audited again next year.

#### **Requests for information and access**

Part 10 of the licence outlines Sydney Water's obligations regarding compliance with reasonable requests from IPART for information relating to Sydney Waters performance, or from NSW Health related to water quality. We consider this section of the licence to be one that poses a moderate to high risk in terms of the likelihood of non-compliance. Despite the high risk related to water quality this clause is not required to be audited every year as NSW Health are provided with the opportunity to provide feedback for each audit period.

Sydney Water achieved full compliance with this clause.

### **Memoranda of information**

In accordance with the *Sydney Water Act 1994*, Part 11 of the licence outlines Sydney Water's obligation to maintain Memoranda of Understanding with its principal regulators. We consider this section of the licence to be one that poses a moderate risk in terms of the likelihood and consequence of non-compliance and, as such, does not warrant audit every year.

Sydney Water maintained a memorandum of understanding with the following organisations:

- The Water Administration Ministerial Corporation (now the Office of Water for Water Management)
- ▼ NSW Health (for water quality)
- The Department of Environment, Climate Change and Water (now the office of Environment and Heritage, for Environmental management).

Sydney Water achieved full compliance with this clause.

#### **Opportunities for improvement**

The auditor has identified a number of potential opportunities where Sydney Water's compliance with the licence could be enhanced, or its practices and procedures could be improved. These opportunities are considered in Appendix C.

We expect Sydney Water to consider all recommendations and suggestions in the auditor's report. Sydney Water will be requested to consider the benefits of implementing such actions and to provide a status report to us by 31 March 2012. The status report will set out the actions and timelines to address the key recommendations detailed in IPART's report as well as the improvement opportunities identified in Appendix C.

We will review Sydney Water's progress in addressing the key recommendations as part of the 2011/12 operating licence audit.

### 3 Historical performance

### **Comparison with previous years performance**

Sydney Water's overall performance in 2010/11 audit demonstrated that it continues to manage its resources and operations in an excellent manner. Figure 4.1 below gives an overview of Sydney Water's compliance with the audited clauses.



Figure 3.1 An overview of Sydney Water's compliance history

Although figure 4.1 demonstrates a continual improvement in compliance history until this year, care should be given to interpreting the data, for 2 reasons. Firstly, this is the first year of auditing Sydney Water's new licence, which is significant shift from prescriptive clauses to systems standards. Secondly, under our risk-based audit approach, the number and type of obligations audited will differ from year-to-year. Some obligations are audited every year, while others are audited less frequently. This means that the data does not provide a direct comparison of year-to-year compliance.

Despite the difficulty of comparison, the compliance history shows that Sydney Water continues to deliver excellent service and is a leading water utility in Australia.

### **Recommendations from previous audits**

The 2009/10 audit report identified improvement opportunities for Sydney Water. The priority recommendation that came out of last year's audit to address the auditor's concern that the sample size used in the analysis of water infrastructure design is not sufficiently representative of Sydney Water's customer base.

Table 3.1	Summary of	progress to addr	ess previous m	ninisterial reco	ommendations
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Recommendation	Progress
Validation of water infrastructure design methodology.	This recommendation has been fully addressed.
Sydney Water to present a report to IPART before 31 March 2011 which outlines information and assumptions that demonstrate the validation of water infrastructure design methodology and assumptions for a range of water supply zones.	
The information provided should be sufficient to enable a determination of the suitability of Sydney Water's approach.	
Critical Water Mains – measures for monitoring and managing failures.	Sydney Water gave an overview of its critical mains analysis process. The processes being
As part of the 1 September 2011 compliance report for the Operating Licence, it would	undertaken are considered to be of a high standard.
provide further assurance to the community that the water system is being managed in an efficient and effective manner and action is being taken to reduce impacts on customers if Sydney Water could note the measures it is taking to monitor, minimise and manage failures to critical water mains.	This recommendation has been fully addressed.

Appendices

A Audit report – Operating licence audit

A Audit report – Operating licence audit





in association with



# **Final Report**

# **Sydney Water Corporation**

# **Operational Audit 2010/11**

prepared for the

# Independent Pricing & Regulatory Tribunal

November 2011

t-cAM Consulting in association with Water Futures Pty Ltd and iConneXX Pty Ltd

## **Final Report**

# Sydney Water Corporation Operational Audit 2010/11

prepared for the

## Independent Pricing & Regulatory Tribunal

November 2011

Rev No.	Date	Title	QA checked by	Authorised by
1	6 Oct 2011	First Draft	DD, AD, CB	тс
2	11 Nov 2011	Second Draft	DD, AD, CB	тс
3	28 Nov 2011	Final Report	DD, AD, CB	тс

t-cAM Consulting, in association with Water Futures Pty Ltd and iConneXX Pty Ltd, has prepared this report in response to specific instructions from its client, the Independent Pricing and Regulatory Tribunal of NSW. The report is intended for the sole and specific uses established in those instructions. Any other person who uses any information contained in this report does so at their own risk.

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## **Executive Summary**

### Introduction

t-cAM Consulting, in association with Water Futures Pty Ltd and iConneXX Pty Ltd (t-cAM team), conducted a detailed audit of Sydney Water's compliance against nominated clauses of its Operating Licence for the 2010/11 year ending 30 June 2011 on behalf of the Independent Pricing and Regulatory Tribunal of NSW (IPART).

IPART provided instructions on the nominated sections of Sydney Water's licence for audit (complete listing of the audit scope is at Appendix 14 – Audit Scope). IPART selected the clauses to be audited in 2011 using its risk based audit scope methodology (details of the risk-based methodology are in Audit Scope section of Chapter 1 – Introduction). IPART also instructed that a Ministerial Request arising from the 2009/10 operational audit should be audited.

A Glossary and dictionary of terms used in this report is provided at Appendix 1.

### **Overall Performance**

Sydney Water has managed its resources in 2010/11 to achieve predominantly **Full Compliance** with the Operating Licence, although one clause was assigned a **High compliance**, as discussed below.

### **Key Findings and Recommendations by Licence Part**

The Key Findings and Key Recommendations, against each Licence part, are set out in the following paragraphs. A number of Secondary Recommendations have been developed. These do not relate directly to compliance, rather they constitute opportunities for improvements and are discussed in the body of this report.

### Water Quality - Part 2

Under the risk-based audit scope, all clauses in this part of the Licence were subject to audit. SWC achieved **Full** to **High Compliance** in meeting its Licence requirements for the quality of water supplied to its customers. The drinking water quality supplied is generally of an excellent standard and complies with the requirements of the Australian Drinking Water Guidelines (ADWG) and the requirements of NSW Health.

High compliance was assigned to one clause as follows:

(1) Shortcomings in the integrity of drinking water storages against potential ingress of vermin and untreated roof runoff (clause 2.1 (a)). This has been addressed in Recommendation R 2.1

While awarding Full compliance for recycled water quality management, the auditor has included a recommendation with regard to the lack of a detailed for the program to

progressively develop Recycled Water Quality Management Plans for all recycled water schemes (clause 2.2 (a)). This has been addressed in Recommendation R 2.2.

### Water Quality Key Recommendations

We recommend that Sydney Water:

R 2.1 Drinking Water Quality

2.1.1 Review the Water Quality Level of Service obligations for asset and maintenance management, in particular: define a maximum tolerable hole size for water tanks that constitutes a 'vermin-proof' condition and a tolerance for the extent of direct runoff that may enter tanks through holes in roofs or other entry mechanisms.

2.1.2 Establish rules to minimise the presence of holes below the roofs of existing tanks that represent possible entry points for vermin and minimise the ingress of runoff from existing tank roofs into the tank including with respect to the anticipated design life and associated renewal/replacement of the relevant components.

2.1.3 prior to 30 June 2012, conduct an audit of tanks that reports the number and location of tanks that fail to meet these requirements, and report the results of this audit to IPART.

2.1.4 prior to 30 June 2012, establish a remediation timetable to expeditiously rectify the faults identified in recommendation 2.1.3, that is to establish a program to fill/mesh any holes below the roofs of existing tanks which may permit the entry of vermin into tanks and address unacceptable water ingress to tanks;

2.1.5 prior to 30 June 2012 amend maintenance strategy, procedures, and associated work instructions and checklists, the asset management renewal/replacement strategy, training and competency needs for staff for inspection, maintenance, testing and operation and renewal/replacement/new specifications for tanks to meet these criteria.

R 2.2 Recycled Water Quality

Prior to 31 March 2012, develop an agreed timetable with NSW Health to complete all RWQMPs for all recycled water schemes and have NSW Health endorse the health aspects of all schemes.

### **Infrastructure Performance - Part 3**

Under the risk-based audit scope, all clauses in this part of the Licence were considered in the audit except those related to the asset management obligation, clauses 3.2 and 3.2. Sydney Water achieved **Full Compliance** in meeting its Licence requirements for the audited infrastructure performance requirements for delivering water and sewage services to its customers. Performance is well within the level required to meet the System Performance Standards for water pressure, water continuity and sewage overflows.

### Infrastructure Performance Key Recommendations

We have no key recommendations for this section of the Licence.

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### Progress on Ministerial Requests from the 2009/10 audit

The Minister had outstanding requests for action on two matters, validation of water infrastructure design methodology and measures for monitoring and managing failures in critical water mains. We consider that both of these matters have been fully addressed and resolved.

### **Customer and Consumer Rights - Part 4**

All clauses in the Customer and Consumer Rights section of the licence were considered in the risk-based audit scope. Sydney Water achieved **Full Compliance** in meeting Licence requirement for customer and consumer rights.

### **Customer and Consumer Rights Key Recommendations**

We have no separate key recommendations relating to this section.

### **Complaints and Dispute Handling - Part 5**

The risk-based audit scope included all clauses in this part of the licence. Sydney Water achieved **Full Compliance** in meeting these Licence requirements.

### **Customer and Consumer Rights Key Recommendations**

We have no separate key recommendations relating to this section.

### **Environment - Indicators and Management - Part 6**

The risk-based audit scope included both clauses in this part of the licence. Sydney Water achieved **Full Compliance** in meeting these Licence requirements.

### Environment – Indicators and Management Key Recommendations

We have no separate key recommendations relating to this section.

### Water Conservation - Part 7

The risk-based audit scope included all clauses in this part of the licence. Sydney Water achieved **Full Compliance** in meeting these Licence requirements.

### Water Conservation Recommendations

We have no separate key recommendations relating to this section.

### **Reporting and maintaining records - Part 9**

The risk-based audit scope included the one clause in this part of the licence. Sydney Water achieved **Full Compliance** in meeting these Licence requirements.

### Reporting and maintaining records Recommendations

We have no separate key recommendations relating to this section.

### Request for information and access - Part 10

The risk-based audit scope included both clauses in this part of the licence. Sydney Water achieved **Full Compliance** in meeting these Licence requirements.

### Request for information and access Recommendations

We have no separate key recommendations relating to this section.

### Memoranda of Understanding - Part 11

The risk-based audit scope included the one clause in this part of the licence. Sydney Water achieved **Full Compliance** in meeting these Licence requirements.

### Memoranda of Understanding Recommendations

We have no separate key recommendations relating to this section.

### Comparison with previous year's performance

Sydney Water's overall performance in 2010/11 shows a slight deterioration relative to its achievement of full compliance performance in the previous 3 audits.



Figure ES -1 An overview of Sydney Water's Compliance History

Under IPART's risk-based audit scope methodology, the scope in a given year may be different to the scope in another year. Some clauses are audited every year, while others are audited less frequently. For this reason, care needs to be used to strictly compare performance over time. For years when relatively fewer clauses were audited, the percentages of a particular audit compliance grade shown in Figure ES-1 will be higher than for years when more Licence clauses are included in the audit scope.

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However, Figure ES-1 does allow some general comments about Sydney Water's performance over time. As discussed in the previous section, Sydney Water did not achieve Full Compliance for every audited clause in 2010/11, being assessed as High Compliance against one Water Quality licence requirement. We have presented further discussion of Sydney Water's performance against Licence requirements over time in Appendix 12.
# **1** Introduction

## **Sydney Water Corporation**

Sydney Water is a State Owned Corporation, which is wholly owned by the NSW Government. Its roles and responsibilities include providing drinking water, recycled water, wastewater services and some stormwater services to more than four million people in Sydney, Illawarra and the Blue Mountains (as shown in Figure 1-1. These roles are derived from the *Sydney Water Act, 1994* (the Act) and the Operating Licence issued to Sydney Water pursuant to Part 5 of the Act.



Figure 1-1 Sydney Water's Areas of Operation

Source: Sydney Water Corporation

## **Regulatory Structure**

Sydney Water's water supply and wastewater service operations are variously regulated by State Government agencies as outlined below:

• The NSW Government, which grants Sydney Water's Operating Licence under the Sydney Water Act 1994

- The Independent Pricing and Regulatory Tribunal (IPART), which recommends the conditions of Sydney Water's Operating Licence to the NSW Government, conducts periodic audits of performance against the Operating Licence and establishes Sydney Water's prices for providing services.
- NSW Health, which regulates Water Quality in NSW. Sydney Water has entered into a Memorandum of Understanding with NSW Health to facilitate effective interaction on water quality management issues.
- The NSW Office of Water (NOW), which regulates water use in NSW. NOW was formerly part of the former Department of Environment, Climate Change and Water (DECCW). Before that, NOW was the Department of Water and Energy (DWE).
- The Office of the Environment and Heritage (OEH), which regulates environmental matters in NSW. OEH was formerly the Department of Environment, Climate Change and Water (DECCW).

## **Operating Licence**

Sydney Water's first Operating Licence was issued in 1992 for a period of five years. The current licence was issued in 2010 and applies until 30 June 2015. The Operating Licence specifies the minimum standards of service or performance that must be met by Sydney Water in relation to its operations.

A copy of the licence is available from Sydney Water's website:

http://www.sydneywater.com.au/Publications/LegislationActs/OperatingLicence.pdf

Part 8 of the Licence provides that IPART (or its appointee) may undertake an Operational audit of Sydney Water's performance against the requirements of the Licence each year.

The performance of Sydney Water for 2010/11 was audited against the specific requirements of the Licence identified by IPART in its audit scope.

## Audit Scope

IPART operates a risk-based approach to licence auditing. This approach matches the frequency of audit of each clause in the Licence to the level of risk (likelihood and consequence) of a potential breach of that clause. Our report details Sydney Water's compliance with those clauses nominated by IPART as requiring independent auditing in 2010/11.

Our report also usually considers any follow up from the prior year audit findings and requests from NSW Health. These comprise Ministerial Requests to Sydney Water and key issues nominated by IPART. For the 2009/10 audit, the key issue was consistency with Australian Drinking Water Guidelines and Australian Guidelines for Water Recycling. Discussion of these matters has been included in relevant sections of this report.

The complete list of clauses nominated by IPART for audit in 2010/11 is shown at Appendix 14 of this report and summarised in the table below.

Licence Part	Description	Section/Clauses
2	Water Quality	2.1 - 2.2
3	Infrastructure performance	3.3 – 3.6
4	Customer and Consumer Rights	4.1 – 4.5
5	Complaints and Dispute Handling	5.1 – 5.2
6	Environmental – Indicators and Management	6.1 - 6.2
7	Water conservation	7.1 – 7.5
9	Reporting and maintaining records	9
10	Request for information and access	10.1 – 10.2
11	Memoranda of Understanding	11

Auditable clauses for the 2010/11 Operational Audit of Sydney Water Corporation

### **Audit Methodology**

It was a condition of this assignment that the operational audit adopted a methodology consistent with ISO 14011 'Guidelines for Environmental Auditing'. This guideline provides a systematic approach to defining the requirements of the audit, planning, interpreting Licence Conditions, collecting audit evidence, objectively assessing the evidence, and reporting in a clear and accurate manner. It also ensures that the audit has been conducted in accordance with an established and recognised audit protocol. The audit methodology that we have applied is discussed further at Appendix 13.

#### Change to our audit process

We constantly seek to improve our auditing performance. Last year our audit team sat as a panel during audit meetings, bringing multiple skill sets to our audits. Using this approach we identified some utility-wide overarching issues in the utilities that we audited.

This year, we have included an international auditor in our team to improve the perspective of the team and bring international experience to our audits. We have also expanded the audit program to include a field trip involving actual asset and process and practice auditing and interviews with Sydney Water field staff. This activity included water quality (both drinking water and recycled water); the operation of Water Treatment Plants; renewals/replacement of water infrastructure and customer management issues.

### Audit Team

The audit team consisted of IPART accredited auditors drawn from *t-cAM Consulting, Water Futures Pty Ltd* and *iConneXX Pty Ltd* as shown in Figure 1-1.



#### Figure 1-1 Structure and Responsibilities of the Audit Team

## **Compliance Assessment Grades**

The table on the following page sets out the ratings used to grade compliance in this audit. These grades are consistent with compliance grades provided by IPART and range from Full Compliance to Non Compliance.

#### Term

Full ComplianceHigh ComplianceModerate complianceLow complianceIow complianceNon complianceInsufficient informationNo requirementStatement of Compliance(S of C)

#### Meaning

All requirements of the condition have been met.

Most requirements of the condition have been met with some minor technical failures or breaches.

The major requirements of the condition have been met.

Key requirements of the condition have not been met but minor compliance achievements have been demonstrated.

The requirements of the condition have not been met.

Relevant, suitable or adequate information to make an objective determination of compliance was not available.

The requirement of this condition falls out of the audit period or there is no auditable requirement.

Compliance with the requirements of the condition has been certified by Sydney Water. Clauses marked S of C are not subject to independent audit this year.

## Structure of this Report

This chapter provides some background and information on Sydney Water, the scope of this audit and a discussion of audit methodology. Chapters 2 to 10 discuss compliance for each of the Licence parts assessed.

In the appendices, we have provided:

- A Glossary of abbreviations, terms used and definitions
- Detailed audit findings for each of section of the Licence that we audited
- Sydney Water's responses to issues raised at the 2009/10 audit
- An comparison of performance with past audits
- Our audit methodology, and
- The 2010/11 Audit Scope

#### **Licence Part Compliance Reporting**

The reporting of compliance for each Licence part is structured as follows:

#### (1) Within the body of this report:

Summary of Licence Part Requirements	Comment on the objective of the Licence part.
Factors Affecting Compliance	A synopsis of factors that may have impacted compliance but were not within the control or influence of utility. These may be ongoing, or one-off events that resulted in a discontinuity between historical performance and the performance reported in this audit period.
Licence Part Compliance	Summary of compliance against the Licence part.
Discussion	A discussion of conclusions drawn, key sources of evidence or other information that provides insight into the reasoning for the level of compliance assigned, especially where this relates to more than one Licence clause.
Recommendations	
<ul> <li>Key Recommendations</li> </ul>	These recommendations focus on improvements related to compliance with the conditions specified in the Licence part. They may also relate to conditions which, in the auditor's view, threaten future compliance with the licence requirement.
<ul> <li>Secondary Recommendations</li> </ul>	Secondary Recommendations address alternative or improved methodologies, processes or practices that could lead to gains in efficiency or effectiveness in compliance. Hunter Water is expected to give due consideration to these secondary recommendations within the context of continuous improvement management principles

Clause/Scope	The number of the clause in the Licence part and, where appropriate, the audit scope status: (NR – No requirement, Audit – subject to this audit, SC – Statement of Compliance).
Operating Licence Obligation	The wording of the clause and (where relevant) any specific aspect that was the subject of audit or 'Requirement'.
Risk	An indication of the possible consequence (in grade and nature) if the requirements of the clause were not met.
Target for Full Compliance	An indication, or target, of the performance or information required for Full Compliance.
2010/11 Audit Grade	The auditor's assessment of the level of compliance achieved by the agency
Auditor Commentary	Auditor commentary and supporting evidence on the reported level of compliance.

#### (2) Within the Tables of Detailed Audit Findings in Appendices 2-10

# (3) Within the Table of Detailed Audit Findings for the 2009/10 Recommendations in Appendix 11

Rec. Ref. No.	The number of the Recommendation in the t-cAM Audit Report for 2009/10.
Audit Recommendation - Details	The wording of the clause and (where relevant) any specific aspect that was the subject of audit or 'Requirement'.
Sydney Water Response	An indication of the possible consequence (in grade and nature) if the requirements of the clause were not met.
Audit comment	An indication, or target, of the performance or information required for Full Compliance.
Planned Completion Date	The auditor's assessment of the level of compliance achieved by the agency

# 2 Water Quality – Part 2

## **Summary of Licence Part Requirements**

Part 2 of the Operating Licence requires Sydney Water to implement the intent of the Australian Drinking Water Guidelines (ADWG) and Australian Guidelines for Water Recycling (AGWR) to the satisfaction of NSW Health. This means that Sydney Water must provide its customers and consumers with drinking water and recycled water of an adequate quality that is safe to use and fit for purpose. The risk-based audit program called for a detailed audit of all clauses in this part.

At IPART's request, we conducted an in depth examination of selected aspects of the ADWG and AGWR for selected sites. The objective of the in depth audits was to field test the practical implementation of Sydney Water's NSW Health-endorsed interpretation of the ADWG and AGWR.

## **Factors Affecting Compliance**

There were no known external issues that may have substantially impacted on Sydney Water's performance with respect to this Licence part.

### Water Quality - Compliance

Overall, we assessed Sydney Water to have demonstrated **Full** to **High Compliance** with the requirements of this part of the Licence. Compliance and supporting commentary for specific Clauses in this Licence part are shown in Appendix 2. The area of High Compliance related to:

• the integrity of drinking water storages against potential ingress of vermin and untreated roof runoff.

We acknowledge that Sydney Water has design criteria to address this issue in new and recently built storages. While we saw no evidence of vermin ingress in the older tanks that we inspected, we consider that any opportunity for ingress by birds and animals should be promptly dealt with from a risk management perspective.

While we have awarded **Full compliance** with regard to RWQMPs, this is in acknowledgment that NSW Health has agreed to the staged implementation of the program to introduce these management plans. However, given that the Australian Guidelines for Water Recycling (AGWR) were finalised in 2006 and conformity with AGWR is a condition of the Licence, we consider that there should be a formal delivery program agreed with NSW Health for the completion of these plans within the timeframe proposed by Sydney Water for their completion.

We have formulated key recommendations to address both these matters.

## Discussion

This audit included an "in-depth" review of critical elements of the supply systems for drinking water and recycled water. The relevant licence requirements are quite general, being:

- 2.1(a) Sydney Water must manage Drinking Water quality to the satisfaction of NSW Health in accordance with the Australian Drinking Water Guidelines (unless NSW Health specifies otherwise).
- 2.2 Sydney Water must manage Recycled Water quality in accordance with:
  - the Australian Guidelines for Water Recycling (unless NSW Health specifies otherwise) to the satisfaction of NSW Health; and/or
  - any other guidelines specified by NSW Health to the satisfaction of IPART.

Sydney Water must report on Recycled Water quality monitoring in the manner and form outlined in the Reporting Manual.

In arriving at the overall grade for these licence requirements, we have sought to strike a fair balance between the criticality of the separate water quality management elements, the extent to which any shortcoming represents a systemic problem, as opposed to a particular and isolated implementation failure, and Sydney Water's overall management of the relevant water quality management system.

In most areas that we audited, we found that Sydney Water was meeting or exceeding the criteria set out in its NSW Health-endorsed documents. For the most part, we consider that Sydney Water is to be commended for its excellence in water quality and recycled water quality management and the linkages between high level objectives and field implementation of those objectives.

However, the integrity of reservoirs and storages for finished drinking water is an important element of the ADWG. In the discussion of Preventive Measures and Multiple Barriers, the ADWG specifically state that "Water distribution systems should be fully enclosed and storages should be securely roofed with external drainage to prevent contamination"<sup>1</sup>.

The ADWG notes "The strength of (a multi-barrier) approach is that a failure of one barrier may be compensated by effective operation of the remaining barriers, minimising the likelihood of contaminants passing through the entire treatment system and being present in sufficient amounts to cause harm to consumers." The issue with preventive measures in the distribution system is that they are the primary barrier addressing the risk of re-contamination, the secondary barriers being residual disinfection levels (chlorine) and cleaning related maintenance practices.

In the area of drinking water, the only area that did not achieve full compliance related to the roofs of older drinking water reservoirs. It is noted, however, that the design of new roofs appears to be meeting appropriate specifications.

<sup>&</sup>lt;sup>1</sup> Australian Drinking Water Guidelines (2004) section 3.3.1, page 3-12.

The field checking of reservoirs identified some potential for ingress of roof runoff or vermin that had not been adequately identified, reported and mitigated in accordance with Sydney Water's expectations and original design intent.

We consider this issue with the older reservoirs inspected to be a potentially serious shortcoming in applying the water quality framework within the ADWG 2004. We are aware that, historically, problems associated with ingress of run-off and vermin have been identified as the primary cause of disease outbreaks in other supply systems when combined with poor, or failure of, secondary barriers.

In the area of recycled water, the AGWR were published in 2006 yet at the time of writing not all recycled water schemes have Recycled Water Quality Management Plans (RWQMP) endorsed by NSW Health. Further, while we acknowledge that this phased implementation approach is acceptable to NSW Health, and the roll out of RWQMPs by Sydney Water has been progressing steadily in a logical order, our concern is that there does not appear to be a program for completion within the firm deadline proposed by Sydney Water for completing all RWQMPs.

## Recommendations

#### **Key Recommendations**

We recommend that Sydney Water:

- R 2.1 Drinking Water Quality
  - 2.1.1 Review the Water Quality Level of Service obligations for asset and maintenance management, in particular: define a maximum tolerable hole size for water tanks that constitutes a 'vermin-proof' condition and a tolerance for the extent of direct runoff that may enter tanks through holes in roofs or other entry mechanisms.
  - 2.1.2 Establish rules to minimise the presence of holes below the roofs of existing tanks that represent possible entry points for vermin and minimise the ingress of runoff from existing tank roofs into the tank including with respect to the anticipated design life and associated renewal/replacement of the relevant components.
  - 2.1.3 prior to 30 June 2012, conduct an audit of tanks that reports the number and location of tanks that fail to meet these requirements, and report the results of this audit to IPART.
  - 2.1.4 prior to 30 June 2012, establish a remediation timetable to expeditiously rectify the faults identified in recommendation 2.1.3, that is to establish a program to fill/mesh any holes below the roofs of existing tanks which may permit the entry of vermin into tanks and address unacceptable water ingress to tanks;
  - 2.1.5 prior to 30 June 2012 amend maintenance strategy, procedures and associated work instructions and checklists, the asset management renewal/replacement strategy, training and competency needs for staff for inspection, maintenance, testing and operation and renewal/replacement/new specifications for tanks to meet these criteria.

#### R 2.2 Recycled Water Quality

Prior to 31 March 2012, develop an agreed timetable with NSW Health to complete all RWQMPs for all recycled water schemes and have NSW Health endorse the health aspects of all schemes.

#### **Secondary Recommendations**

The following Opportunities for Improvement (OFI) have been identified:

- SR 2.1 Where NSW Health has signed off water quality management plans, the critical limits involved need to be observed. Enhance awareness among recycled water system operators of the critical limit criteria endorsed by NSW Health and of the regulatory significance of achieving these criteria.
- SR 2.2 Clarify with NSW Health the specific details of filtration performance critical limits – do they apply to individual or combined filter effluent sampling points? This discussion should cover both potable water plants from higher risk sources/periods and recycled water plants supplying high exposure uses.
- SR 2.3 Review ways to help keep caps on the sample taps in areas where contractors might use those taps to get water and not replace them. This recommendation also applies at service reservoirs. (For details, refer to Appendix 2, page 7)
- SR 2.4 Building on the existing analysis for each plant, and as part of the move to disinfectant contact time (CT) reporting at plants, identify the minimum worst case CT (shortest possible contact time, taking into consideration short-circuiting effect) for each plant to ensure that this cannot drop below a specified minimum value.
- SR 2.5 If moving away from hatch alarms, consider the potential for using some other method to control the risk such as portable ladder access.
- SR 2.6 Review the implications of the P1 (high) to P4 (low) priority system for the asset inspections being the converse of the P1 (low) to P6 (high) priority system for the more regular inspections for reservoirs.
- SR 2.7 In validating recycled water schemes, consider moving away from any reliance being placed upon, or any reference being made to, the indicative estimated values in Table 3.4 of the AGWR and rely instead on objective, verifiable evidence for all assumptions made in validation for all schemes.
- SR 2.8 Although outside of Sydney Water's area of responsibility, to help mitigate risks to Sydney Water schemes, seek to promote enhanced control of post-occupancy plumbing cross-connection risks where involuntary consumption of recycled water may arise.
- SR 2.9 Review the implications of the three sample site codes being identical for the exit of the three chlorine contact tanks at Rouse Hill Recycled Water Plant.

# 3 Infrastructure Performance – Part 3

## **Summary of Licence Part Requirements**

Part 4 of the Operating Licence establishes an asset management framework and requires Sydney Water to achieve specific standards of service delivery to customers from its water and sewerage service infrastructure. This part also requires Sydney Water to collect indicators of infrastructure performance; comply with response times for water main breaks; and deliver sewerage to unserviced areas through the Priority Sewage Program. The risk-based audit program called for a detailed audit of all clauses except those relating to the asset management framework.

## **Factors Affecting Compliance**

Climatic conditions, especially rainfall, have been relatively favourable and stable during 2010/11. This has meant that climate had a neutral impact on Sydney Water's ability to meet performance requirements.

Sydney Water has experienced failure of the "Dial before You Dig" program to provide timely information on third party assets. This lack of prompt asset information can compromise Sydney Water's ability to respond quickly to operational issues, including compliance with Licence response time requirements.

### **Infrastructure Performance – Compliance**

We assessed Sydney Water performance as demonstrating **Full Compliance** with all audited requirements of this section of the Licence in 2010/11. The results for the System Performance Standards are set out in Table 3.1 below.

Standard	Target	Result
Pressure less than 15 metres	6,000 properties	834 properties
Unplanned Water Interruption exceeding 5 hours	40,000 properties	26,205 properties
3 or more unplanned interruptions exceeding 1 hours	14,000 properties	5,305 properties
Uncontrolled dry weather sewage overflow	14,000 properties	9,158 properties
3 or more uncontrolled dry weather sewage overflow	175 properties	30 properties

#### Table 3-1 Infrastructure Performance against Standards

Supporting commentary for specific clauses in part 3, Infrastructure Performance, are provided in Appendix 3.

## Discussion

Overall, compliance with this section of the Licence has generally improved over the five years leading up to this audit. During that time, we have systematically considered a range of asset management issues that are critical for a water utility over the period. This approach has provided an opportunity to encourage targeted and integrated achievement of improved performance.

We consider that Sydney Water has comprehensive programmes in place to manage performance of their water and wastewater infrastructure. This is supported by mainly integrated electronic systems for asset attribute, condition and performance data capture and high level reporting. During the audit process a number of infrastructure performance examples were examined both from an operating licence performance aspect and from an issue to resolution perspective. We found that all of the Operating Licence performance measures covered in this years audit were well compiled, comprehensively explained and robust evidence was provided that was easy to track from issue identification through to the initiation of works orders and final performance reporting.

Sydney Water has shown that there are some very innovative approaches being applied to service delivery and risk management within the organisation, particularly in the area of risk and criticality determination and management. We also observed strong linkages between the different programmes running across the business and how these were supported by the Alliance and Civil Maintenance staff.

#### **Drinking Water Pressure**

#### **Compliance and Historical Trends**

The number of properties affected by low pressure has been declining significantly over the period from a high of 5,826 properties in 2002/03. However, this year's result of 834 properties is a large increase from the 36 properties last year. That said, this should be placed into perspective and simply reflects two substantial operational issues.

#### Summary

In 2010/11, Sydney Water fully complied with the Pressure Standard that not more than 6,000 properties are affected by a water pressure incident where the water pressure to a property falls below 15 metres, at the point of connection of the property to Sydney Water's main.

#### **Unplanned Interruptions to Drinking Water Supply**

#### **Compliance and Historical Trends**

In 2010/11, 26,205 properties were affected by an unplanned water supply interruption of more than 5 hours. This is a substantial increase from the 21,050 properties in 2009/10 and slightly higher than the 25,656 properties in 2008/09. Sydney Water is investigating the causes of individual interruption events but, as yet, has not been able to identify one or more unifying causes. Sydney Water management recognises that this increasing trend needs to be monitored.

5,305 properties were affected by three or more unplanned water supply interruptions of more than 1 hour. This is a new standard so comment on historical trends is not possible.

#### Summary

In 2010/11, Sydney Water fully complied with the Water Continuity Standards that no more than 40,000 properties experience an unplanned interruption of water supply exceeding 5 hours and that no more than 14,000 properties experience three or more unplanned interruption of water supply exceeding 1 hour.

#### **Sewage Overflows**

#### Compliance and Historical Trends - single overflows

Sydney Water recorded that 9,158 properties were affected by overflows for 2010/11. While this is a new standard, Sydney Water has been monitoring this measure for some time. This year's performance is comparable to that of recent years (9,905 properties in 2009/10).

Sydney Water has had a comprehensive sewer strategy in place for a number of years. In the last 18 months, Sydney Water has been enlisting customers' support to address tree root intrusion into the sewer system. This has provided further support to the basic sewer strategy. This strategy appears to be achieving some good results.

#### Summary

In 2010/11, Sydney Water fully complied with the Sewer Overflow Standards that no more than 14,000 properties experience an uncontrolled sewer overflow in dry weather and that no more than 175 properties experience three or more uncontrolled sewer overflow in dry weather.

#### **System Performance Indicators**

The current licence requires that Sydney Water maintain record systems that are sufficient to enable it to measure accurately its performance against the Service Quality and System Performance Indicators. We investigated the systems and procedures used by Sydney Water to record the asset management data from which the Indicators are derived. We are satisfied that all of the Operating Licence performance measures audited were well compiled with robust evidence to track measures from notification of a supply incident through to issue resolution and reporting.

We are not aware that there has been any ambiguity in the definitions and applications of service quality and system performance indicators. Clause 3.4 (b) of the Licence requires that IPART's interpretation of such ambiguities should prevail. We have observed nothing that suggests that IPART's interpretation would not be accepted.

#### Response time for water main breaks.

The times to respond to water main breaks are set out in Table 3-2 below.

Water Main Break Priority	Licence Requirement	Sydney Water performance
Priority 6	90% jobs in less than 3 hours	90.67% jobs in less than 3 hours
Priority 5	90% jobs in less than 6 hours	92.61% jobs in less than 6 hours
Priority 4	90% jobs in less than 5 days	94.99% jobs in less than 5 days

#### Table 3-2 Water Main Break Response Times

As the above table shows, Sydney Water fully complied with the response time requirement set out in the Licence.

#### **Priority Sewerage Program**

Sydney Water's progress against the Licence requirements for the Priority Sewerage Program are summarised in Table 3-3.

Area	Licence Requirement	Sydney Water Progress
Agnes Banks, Londonderry	Service available by 31 December 2012	Construction complete
Glossodia, Freeman's Reach and Wilberforce	Service available by 31 December 2012	Construction complete
Yellow Rock and Hawkesbury Heights	Service available by 31 December 2012	Construction complete
Appin	Service available by 30 June 2015	12% complete, scheduled for June 2012
Austral and West Hoxton	Service available within 24 months of sewer services being available to adjoining areas.	Not triggered as Minister has not made a determination that adjacent areas are significant. Planning underway.
Wilton	Service available within 24 months of sewer services being available to adjoining areas.	Not triggered as Minister has not made a determination that adjacent areas are significant. Planning underway.
Menangle and Menangle Park	Service available within 24 months of sewer services being available to adjoining areas.	No construction in adjacent area as yet.
Cowan and Bargo	Complete planning and commence construction by 2015.	Planning underway.

Table 3-3 FILUTILY Sewerage FILUgrath FILUgress Summary
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This table, together with other evidence that we have received, demonstrates that Sydney Water is fully compliant with all Priority Sewerage Program requirements in the Licence.

#### **Ministerial Requests**

The Minister had outstanding requests for action on two matters, validation of water infrastructure design methodology and measures for monitoring and managing failures in critical water mains. Sydney Water prepared a report to IPART before 31 March 2011 dealing with the validation of water infrastructure design methodology. Sydney Water prepared a report to the Minister dealing with measures for monitoring and managing failures in critical water mains. We have been provided with evidence that both of these matters have been fully addressed and resolved.

## Discussion with field staff

As part of the Operating Licence audit, auditors undertook a site visit to two treated water reservoir sites and a mains replacement project. The key benefit of undertaking a site visit as part of the audit has been to see how well site staff activities demonstrate alignment with head office objectives.

During the visit, we were able to question operations staff around construction and asset management practices, water quality management, customer management and information management issues and found respondents to be extremely knowledgeable. Staff were able to clearly demonstrate that in most cases practices identified and promoted in the office were being implemented appropriately in the field.

We were impressed by the quality control on site for the pipeline renewal project visited and were pleased to see that there were a number of mechanisms in place for site staff to feed back into organisational processes. For example through the use of systems to update incorrect asset data (on Tough Books), robust site Q.A processes (for example asset data recording and auditing and timeframes) and operational input into asset planning where appropriate. During the reservoir visits, a number of water quality related asset management issues were discovered which have more appropriately been discussed in detail in the Water Quality section of this report.

## Recommendations

#### **Key Recommendations**

We have no key recommendations for this section of the Licence.

#### **Secondary Recommendations**

We recommended that Sydney Water:

- SR 3.1 Sydney Water appears confident the evident increasing trend in unplanned water interruptions is manageable. Questions were raised regarding how Sydney Water intended to monitor these increases and at what point would other options be investigated to ensure that the measure target was not exceeded. Due to the potential lag between performance and implementation of mitigation activities, we would recommend that Sydney water determine what the trigger points would be where additional works/investigations will be undertaken to ensure ongoing compliance with unplanned interruptions measure.
- SR 3.2 A number of manual processes were in place to compile and there is a potential for errors with the large number of spread sheets that are being linked etc to provide appropriate reporting. We understand that this is being addressed in the near future.
- SR 3.3 Optimise internal work processes used for Dial Before You Dig requests and work with other agencies to streamline the process.

# 4 Customer and Consumer Rights – Part 4

## **Summary of Licence Part Requirements**

Part 4 of the Operating Licence requires Sydney Water to satisfy the rights of both consumers and customers in its provision of water and wastewater services. The scope of the risk-based audit included all clauses in this part of the Licence.

## **Factors Affecting Compliance**

We consider that no external factors substantially impacted on Sydney Water's ability to comply with the requirements of this Licence part.

## **Customer and Consumer Rights - Compliance**

Overall, we assessed that Sydney Water exhibited **Full Compliance** for all clauses of this Licence part for 2010/11. Compliance and supporting commentary for specific clauses of this part may be found in Appendix 4.

## Discussion

Generally, the policies and procedures for customer and consumer rights are comprehensive and are available on the website as required by the operating licence.

In managing customer and consumer rights, we found excellent organisation within the contact centre, both regarding monitoring of calls, the depth and breadth of training and assessment and the general operating ethos to ensure staff retention, accurate information recording and development of a strong service focus. We also found good evidence of interaction with other organisations.

We consider that Sydney Water could devote some further attention to the following points:

The search engine on the Sydney Water website is not as targeted as it could be, for example a search under "Customer Contract" should bring the contract up straight away.

The pamphlets prepared for distribution to customers could present the key procedures around payment options etc in a little more detail.

Although the water bill itself has details regarding translation services, these are not easily accessible on the website.

### Recommendations

#### **Key Recommendations**

There are no key recommendations for this section

#### **Secondary Recommendations**

We recommend that Sydney Water:

- SR 4.1 Include translation services (written in different languages) on the front page of the website to assist those customers and tenants etc with English as a second language
- SR 4.2 Improve the searching function of the website to ensure important documents such as the customer contract and other customer policies are easily accessible, for example included in the "Quick Links" function.

# 5 Complaints and Dispute Handling – Part 5

### **Summary of Licence Part Requirements**

Part 5 of the Operating Licence requires Sydney Water to establish and maintain robust complaint handling procedures and effective dispute resolution processes. The risk-based audit scope included all clauses in this part of the Licence.

## **Factors Affecting Compliance**

There are no substantive factors that have impacted on Sydney Water's performance against part 5 of the Licence in 2010/11.

## **Complaints and Dispute Handling - Compliance**

We assessed Sydney Water's performance against this part of the Licence as **Full Compliance** for 2010/11. Compliance and supporting commentary for the individual clauses in this part are outlined in Appendix 5.

## Discussion

Sydney Water is a natural monopoly with extensive legislated powers. This section of the licence is designed to ensure that Sydney Water does not abuse these powers. It establishes some basic customer and consumer rights and sets out obligations to ensure that Sydney Water respects these rights. This section of the licence is important because poor performance in the area of customer rights would impact on the public trust and confidence in Sydney Water and could result in legal costs to the Corporation, which would need to be recouped from customers.

Sydney Water appears to be improving in this area and conscientiously addressing the operating licence obligations as evidenced by the number of detailed policies, the training of customer facing staff and the ongoing focus on hardship. It was pleasing to see Sydney Water making clear linkages between hardship management and water use efficiency and embarking on a programme to address water efficiency for those within the community who are struggling to cover service costs. These programmes appear to be fairly advanced for the water sector and highlights Sydney Water's empathetic commitment to both customer issues and water efficiency.

In managing customer and consumer rights, we found:

- a strong management focus on customer issues,
- very good training and staff awareness, and

• an ongoing focus regarding customer hardship and ways to engage with those in financial difficulty.

That said, however, we believe that the process for complaint handling was not sufficiently detailed on the website and that the information provided regarding complaint handling within documentation sent to customers could be improved.

## Recommendations

#### **Key Recommendations**

There are no key recommendations for this section

#### **Secondary Recommendations**

We recommend that Sydney Water:

- SR 5.1 Provide more detail regarding the complaints process on the Sydney Water Website to ensure that customers understand the different steps involved in the complaint resolution process
- SR 5.2 Provide a link to the Complaints Policy on the website where the complaints process is addressed
- SR 5.3 From 2012/13, ensure that Water Wrap contains some condensed wording around the complaints handling process in addition to the "our contract with you" pamphlet

# 6 Environment – Indicators and Management – Part 6

## **Summary of Licence Part Requirements**

In the exercise of its functions, Sydney Water has a considerable impact on the environment. This section of the licence is designed to ensure that Sydney Water's environmental performance is consistent with current environmental management practice. Part 6 of the Licence requires the establishment of a robust framework and reliable and auditable application of that framework. It also requires Sydney Water to collect and report environmental indicators. The risk-based audit scope included both clauses of this part.

## **Factors Affecting Compliance**

There are no substantive factors that have impacted on Sydney Water's performance against Part 6 of the Licence in 2010/11.

### **Environment – Indicators and Management – Compliance**

We assessed both clauses of this part as **Full Compliance** for 2010/11. Compliance and supporting commentary for individual Clauses in Part 6, Environment – Indicators and Management, are outlined in Appendix 6.

## Discussion

Sydney Water is maintaining a very high standard of environmental management. Any issues that arise are dealt with both internally and externally through fora such as the Joint Operating Group. Sydney Water proactively liaises with its regulator in this area (Office of Environment and Heritage (OEH)) to ensure commonality of understanding – an example from this audit period being the clarification of reporting status of targets with OEH via a presentation from Sydney Water's environmental staff.

In acquitting its environmental obligations, Sydney Water:

- Has a strong environmental focus
- Manages its operations in this area with diligence
- Has staff with a very good awareness of the requirements of this component of the operating licence

While some issues with contractors had been noted in the information provided, it is clear that Sydney Water has the correct procedures and oversight in place for managing this risk area.

### Recommendations

#### **Key Recommendations**

There are no key recommendations for this section

#### **Secondary Recommendations**

We recommend that Sydney Water:

SR 6.1 Ensure that the information contained in transmittal emails to regulator/s clearly explains the purpose of the correspondence. For instance, the subject line of the email should contain more information regarding the subject of the email and the relevant regulator (e.g. IPART, Transmittal of 1 September Reports).

# 7 Water Conservation – Part 7

## **Summary of Licence Part Requirements**

Part 7 of the Licence requires Sydney Water to report on various initiatives to practice and promote water conservation. It also requires Sydney Water to develop, maintain and publish a water conservation strategy that provides a transparent basis for its water conservation activities. The risk-based audit scope included all clauses of this part of the Licence.

## **Factors Affecting Compliance**

Although Sydney Water encourages the use of recycled water schemes, this is in part driven by consumer demand. Due to its higher cost, this is not always an attractive option for some businesses and industry. We consider that there are no other substantive factors that have impacted on Sydney Water's performance against Part 7 of the Licence in 2010/11.

## Water conservation - Compliance

We assessed **Full Compliance** for Sydney Water's performance against all clauses of section 7 of the Licence in 2010/11. Compliance and supporting commentary for the individual clauses in this part are outlined in Appendix 7.

## Discussion

Sydney Water's efforts in water conservation are mature and robust with excellent linkages across different programs, eg offsetting the gains from the leakage prevention program with those anticipated from the pressure management program. Where appropriate, Sydney Water undertakes reviews to ensure the ongoing financial and physical performance of these programmes for the benefit of the utility and the community as a whole.

Sydney Water has been operating some of its water conservation programs for around 15 years, showing an ongoing commitment to management of water efficiency in the region. There is a demonstrated ethos of continuous improvement aligned with corporate responsibility for the community that it serves. Recent improvements have been the attainment of the leakage reduction target over the last 18 years, following achievement of this target, Sydney Water is now moving into a long term maintenance phase. This is balanced by the implementation of the pressure reduction strategy which has involved significant consultation with the business community. Ongoing water efficiency and hardship programmes also contribute to the overall water conservation goals of the Corporation.

Sydney Water has developed water efficiency programs that are robust in that they deliver results that are tempered with the appropriate performance and financial reviews thus ensuring that resources and programmes are optimised. In managing water conservation, Sydney Water has invested a large amount of time and effort in changing water use habits of its customers and has generally changed the face of the water industry through water

conservation programs and other programs that make linkages between hardship and water efficiency.

## Recommendations

#### **Key Recommendations**

There are no key recommendations for this section.

#### **Secondary Recommendations**

There are no secondary recommendations for this section.

# 8 Reporting and Maintaining Records – Part 9

## **Summary of Licence Part Requirements**

Part 9 of the Operating Licence requires Sydney Water to comply with the requirements in the Reporting Manual and provide NSW Health with water monitoring information. It also requires Sydney Water to maintain records sufficient to enable this reporting. The risk-based audit scope for 2010/11 included the one clause in this part.

## **Factors Affecting Compliance**

There have been no external factors that have significantly impacted on Sydney Water's ability to meet its obligations under this part of the Licence.

## **Reporting and Maintaining Records - Compliance**

We assessed Sydney Water's performance as **Full Compliance** against the clause of section 9 of the Licence in 2010/11. Compliance and supporting commentary for the individual clauses in this part are outlined in Appendix 8.

## Discussion

IPART has developed a Reporting Manual that sets out Sydney Water's requirements to report to IPART. This manual includes some of the key reporting requirements of NSW Health. This has centralised reporting requirements and assisted Sydney Water, IPART NSW Health and auditors to reference relevant requirements.

## Recommendations

#### **Key Recommendations**

There are no key recommendations for this section.

#### Secondary Recommendations

We recommend that Sydney Water consider:

- SR 9.1 While the current segmented document and records control system appears to be functional, it would be beneficial for Sydney Water to consider having an overarching document control system for the business. It is understood that a corporate-wide document control system is currently being considered.
- SR 9.2 The Project Manager Regulatory Affairs is the main hub for use and control of the Online Compliance Program. Having largely a sole person with this responsibility could present a risk for Sydney Water. While it is acknowledged that risk is mitigated somewhat by the creation of a manual for use of the Online Compliance Program by the Project Manager, the manual is currently not a controlled document (although it is accessible from the S drive) and should become so.

# 9 Request for Information and Access – Part 10

### **Summary of Licence Part Requirements**

Part 10 of the Licence requires Sydney Water to comply with requests for certain information and access to the sources of this information by IPART. It also requires Sydney Water to comply with requests for certain information by NSW Health. The risk-based audit scope for 2010/11 included the two clauses in this part.

## **Factors Affecting Compliance**

There have been no external factors that have significantly impacted on Sydney Water's ability to meet its obligations under this Licence Part.

## **Request for Information and Access - Compliance**

We assessed Sydney Water's performance as **Full Compliance** against clauses of section 10 of the Licence in 2010/11. Compliance and supporting commentary for the individual clauses in this part are outlined in Appendix 9.

## Discussion

This part of the Licence complements the requirements of the previous Licence part, which deals with reporting to IPART and NSW Health. It is designed to address the "information asymmetry" between the holder of information and regulators that have a legitimate requirement to request that information.

### Recommendations

#### **Key Recommendations**

There are no key recommendations for this section.

#### **Secondary Recommendations**

There are no secondary recommendations for this section.

# **10** Memoranda of Understanding – Part **11**

## **Summary of Licence Part Requirements**

Part 11 of the Licence requires Sydney Water to maintain Memoranda of Understanding (MOU) with its principal regulators, namely the Water Administration Ministerial Corporation (now the Office of Water, NOW, for water management), NSW Health (for water quality) and the Department of Environment, Climate Change and Water (now the Office of Environment and Heritage, OEH, for environmental management). The risk-based audit scope for 2010/11 included the one clause in this part.

## **Factors Affecting Compliance**

There have been no external factors that have significantly impacted on Sydney Water's ability to meet its obligations under this Licence Part.

## Memoranda of Understanding - Compliance

We assessed Sydney Water's performance as **Full Compliance** against the clause of section 11 of the Licence in 2010/11. Compliance and supporting commentary for the individual clauses in this part are outlined in Appendix 11.

## Discussion

This part of the Licence codifies a requirement of the *Sydney Water Act 1994* (NSW). It also sets out the required content of these MOUs, namely to recognise these regulators and commit to the relevant regulatory obligations.

## Recommendations

#### **Key Recommendations**

There are no key recommendations for this section.

#### Secondary Recommendations

We recommend that Sydney Water consider:

SR 11.1 **MoU Health (draft 2011)**: While there is a responsibility on NSW Health at Clause 8.4 to provide advice on wastewater management activities, it is suggested that at Clause 4.2, wastewater and in particular, health issues related to biosolids, are formally recognised (not withstanding that ad hoc joint working parties may be established to investigate specific technical issues).

SR 11.2 **MoU WAMC (2011)**: Note that Attachment A (The Western Sydney Recycled Water Initiative: Operating Protocol) will have to be reviewed more frequently than the MoU in entirety to ensure that contact details and personnel remain current. Note that Section 9.2 of the Protocol requires at least annual review by the parties, however, it is advised that Sydney Water includes a requirement in its Folio of Progress to ensure that annual review of the Attachment will be undertaken and that within the 'Interpretation' section of the Folio, that Sydney Water states that annual review is only for the Protocol itself and not of the MoU in its entirety.

# **Appendix 1 – Glossary and Dictionary**

## Abbreviations/Acronyms

Abbreviation/Acronym	Description
Act	Sydney Water Act, 1994 (NSW).
ADWG (2004)	Australian Drinking Water Guidelines (2004), National Health and Medical Research Council and Natural Resource Management Ministerial Council
AGWR	Australian Guidelines for Water Recycling (2006), The Environment Protection and Heritage Council, the Natural Resources Management Ministerial Council and the National Health and Medical Research Council.
AOMS	Assets and Operations Maintenance System
AS	Australian Standard
AWQC	Australian Water Quality Centre
CCTV	Closed Circuit Television
CIS	Customer Information System
CMS	Complaints Management System
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DA	Development Application
DAL	Department of Analytical Laboratories (Lidcombe)
DEC	Former Department of Environment and Conservation – now OEH
DECC	Former Department of Environment and Climate Change– now OEH
DECCW	Former Department of Environment, Climate Change and Water – now OEH

#### Abbreviation/Acronym Description

DEUS	Former Department of Energy, Utilities and Sustainability – covered part of the former DLWC
DLWC	Former Department of Land and Water Conservation (NSW) then changed to DWE
DIPNR	Former Department of Infrastructure, Planning and Natural Resources (NSW) – now covered by Department of Planning, OEH, NSW Office of Water (NOW) and Department of Industry and Investment NSW
DWE	Department of Water and Energy – now covered by NSW Office of Water (NOW)
EMP	Environmental Management Plan
EPA	Environment Protection Authority (NSW) – Now part of the Office of Environment and Heritage (OEH)
ESD	Ecologically Sustainable Development
EWON	Energy and Water Ombudsman NSW
GEMP	Government Energy Management Plan
GIS	Geographical Information Systems
GL	Gigalitre
Sydney Water, SWC	Sydney Water Corporation
НРС	Heterotrophic plate count bacteria
IPART	Independent Pricing and Regulatory Tribunal (NSW)
ISO	International Standards Organisation
ІТ	Information Technology
kL	Kilolitre (1 thousand litres)
km	Kilometre
ML	Megalitre (1 million litres)
MOU	Memorandum of Understanding

MNF	Minimum Night Flows
M&R	Monitoring and Reporting
NATA	National Analytical Testing Authority
NOW	NSW Office of Water.
NPR	National Performance Report (published by the National Water Commission and the parties to the National Water Initiative).
NSW Health	NSW Department of Health
OEH	Office of Environment and Heritage (formerly DECCW, the NSW Environmental Regulator)
ра	Per annum
РАС	Powdered Activated Carbon
рН	A measure of the acidity of a solution related to the concentration of hydrogen ions.
QA	Quality Assurance
RFQ	Request for Scope of Work and Quote (sent by IPART on 5 July 2011)
SCADA	Supervisory Control and Data Acquisition
SEDA	Sustainable Energy Development Authority
SLC	Strategic Liaison Committee
STP	Sewage Treatment Plant
WML	Water Management Licence
WRAPP	Waste Reduction and Purchasing Policy
WSAA	Water Services Association of Australia
WTP	Water Treatment Plant

#### Abbreviation/Acronym Description

Term	Meaning
the Act	Sydney Water Act 1994 (NSW)
Area of Operations	As specified in Section 10 of the Act and described in Schedule 1 of the Operating Licence.
Audit period	1 July 2010 to 30 June 2011.
Auditor	t-cAM Consulting, supported by Water Futures Pty Ltd and iConneXX Pty Ltd
Commencement Date of Operating Licence	1 July 2010.
End of Term Review	A review of the Operating Licence to be commenced on or about 1 January 2014.
Function	Means a power, authority or duty.
Minister	The Minister responsible for administering the provisions of the <i>Sydney Water Act 1994</i> (NSW).
Operating Licence or licence	The Licence issued by the Governor of NSW to Sydney Water for the provision of services between 1 July 2010 and 30 June 2015.
S of C	A Statement of Compliance signed by the Chief Executive and the Chairman of the Board of Sydney Water, submitted to IPART attesting that Sydney Water was compliant with the relevant clause in the licence. Clauses marked "S of C" are not subject to independent audit this year.
Water Management Licence	A Water Management Licence granted to Sydney Water under the <i>Water Act, 1912</i> (NSW) and issued by the DNR (now Office of Water) on 26 August 2005 and updated on 24 August 2009 to reflect required amendments. The term of this licence extends until 1 July 2025.

## **General Terms and Definitions**

# Appendix 2 Water Quality Detailed Audit Findings (Part 2)

Appendix	Appendix 2 Water Quality Detailed Audit Findings (Part 2)						
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary		
2.1	Drinking Water						
2.1(a) Audit	Sydney Water must manage Drinking Water quality to the satisfaction of NSW Health in accordance with the Australian Drinking Water Guidelines (unless NSW Health specifies otherwise).	Very High Risk Major risk of serious and widespread health impacts	Water quality management systems that are totally consistent with all aspects of the Australian Drinking Water Guidelines (ADWG) and result from consultation with NSW Health.	High	Composite Overall Grade that summarises the separate assessments of each of the following in-depth components. The separate elements have been individually graded from Moderate to Full Compliance. Water Quality management (for both drinking water and recycled water) is important and can have substantial public health implications. In arriving at the overall grade, we have sought to strike a fair balance between the criticality of the separate elements, the extent to which any shortcoming represents a systemic problem as opposed to a particular implementation failure, and Sydney Water's overall management of the relevant water quality management system.		
				Full	Application of the ADWG to water filtration plants Overview The NSW Health-approved 5 yr DWQMP identified 0.1 NTU as the target value for water filtration plants. Such a target is international best practice (as set out in USEPA and Water Treatment Alliance documents) if appropriately monitored and managed and represents compliance beyond the ADWG recommendation of 1 NTU at the point of disinfection. The target also exceeds the 2011 ADWG revision which is expected to have a 0.2 NTU target and 0.5 NTU maximum for filtration where the control of protozoan parasites is an objective. The in-depth audit explored how this target value was implemented in practice.		
				Full	In depth (sample site: Orchard Hills WTP site). SW was found to be complying with the 0.1 NTU target at the audited Orchard		

Appendix 2 Water Quality Detailed Audit Findings (Part 2)						
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary	
					<ul> <li>Hills WFP. The way that SW was implementing this target was found to be at international best practice. The following key points were observed.</li> <li>SW has introduced a margin of safety of 10 to 20% between the 0.1 NTU target (advised to and approved by health) and the operational process target in place in the field. This provides for reliable compliance and allows for factors such as a possible instrument accuracy drift and improves water quality outcomes for customers. SW is highly unlikely to be in a position of possible breach of its NSW Health-approved plan.</li> <li>The 0.1 NTU target is applied to individual filters rather than merely combined filter effluent. This is an important point and is a best practice approach. Each filter has its effluent turbidity monitored continually. Backwash is triggered on any of three factors: head loss, time or turbidity, essentially the most conservative of the three, with backwash being triggered on turbidity at 0.09 NTU for individual filters. This once again is best practice. The plant is shut down if the combined filter effluent turbidity refluent turbidity reads above 0.09 NTU and an alarm is trigged if the combined filter effluent exceeds 0.08 NTU. The dead time before action is only a few minutes in each case. This represents international best practice and is beyond the recommendations of, for instance, US regulations (0.15 NTU 95% of the time), and is more stringent than the recommendations of the soon to be revised ADWG 2011 version (thought to be 0.2 NTU then stated plant targets and at best practice values, e.g.:</li> <li>raw turbidity 5.70 NTU when read on the instrument, 5.45 NTU when read on the SCADA about 30 mins later</li> <li>raw pH 7.02 when read on the instrument, 7.34 on the SCADA when read on the SCADA about 30 mins later</li> <li>combined filter turbidity 0.022 NTU when read on the instrument, 0.021</li> </ul>	

Appendix 2 Water Quality Detailed Audit Findings (Part 2)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary		
					NTU when read on the SCADA about 30 mins later		
					Raw water was being measured continually for parameters including turbidity and pH. The results are used to trigger a plant shut down in the event of excessive turbidity at a level (20 NTU) set based on plant operator experience. The result is that the plant would be protected from excessive loadings that may compromise its operation.		
					The location of all instruments was checked, their point of draw off of water and the length of the sample lines was appropriate and would give rise to readings that would be consistent with the quality of water being supplied. The location of sample taps for grab samples was appropriate and would draw water that was representative of the quality of water for the point being monitored. On line instrument readings in field were checked against readings in the SCADA and found to be consistent.		
					The raw water sample tap inspected at Orchard Hills was lacking a cap at the time of inspection and the label was becoming faded. This was a minor defect and had no bearing on drinking water quality to the consumer although it may marginally increase the risk of a false positive reading. It was suggested that the sample taps can be used to draw water by contractors on the site leading to loss of the sample caps.		
					Conclusion		
					One result of this best practice operation is that protozoan pathogen ( <i>Cryptosporidium</i> and <i>Giardia</i> ) removal across the filters operated by SW would be excellent, probably over 99.99%. Given the nature of the source waters supplied by SCA, there would be no realistic likelihood of a waterborne disease outbreak or of any significant adverse health consequences arising from protozoan pathogens for drinking water consumers with water treated to such high standards.		
					A second result of this good operation is that there are many benefits, both tangible and intangible, downstream of the treatment plants. For instance, all of the common measures of water quality will be improved by having very tight turbidity limits on the treated water. For instance:		
					disinfection by-products will be reduced leading to reduced chemical public health risk		

Appendix	ix 2 Water Quality Detailed Audit Findings (Part 2)						
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary		
					<ul> <li>chlorine residuals will penetrate further leading to reduced microbial public health risk</li> <li>chlorine dosing costs will be reduced</li> <li>dirty water and taste and odour complaints and customer inconvenience will be reduced</li> <li>downstream treatment costs to industrial and process water customers will be reduced</li> <li>cleaning and flushing frequencies for tanks and networks will be reduced (this latter effect was noted by long-term operators during the audit of the network).</li> <li>Overall, by getting the water quality as good as practicable upfront, subsequent water quality and operational risks and costs are minimised.</li> </ul>		
				Fuii	Application of the ADWG to primary disinfection Overview SW makes more general claims in relation to disinfection in the 5 yr DWQMP. Therefore, the audit looked in depth at how SW managed primary disinfection in accordance with these claims. The audit reviewed SOP IMS0067 Management of Disinfection of Drinking Water and interviewed key staff. The limits applied by SW for primary disinfection by free (HOCI) chlorination are typically at international best practice. SW has examined the CT values achieved by its treatment plants in detail to provide a good estimate of the CT and the variability in the CT achieved by its plants. SW provided a detailed worked analysis of the CT values for each plant and this analysis was reviewed on site. The detailed calculation worksheet used by SW helps estimate the frequency distribution (histogram) of CT values across various operating conditions for each plant. Ongoing review and improvement of disinfection takes place, consistent with the relevant SOP. The ADWG recommends disinfection to achieve a CT of 15 mg•min/L (0.5 mg/L detectable free residual after 30 min contact time). SW's objective is to target a CT sufficient to achieve significant reduction of the protozoan parasite Giardia based on US guidance. These disinfection targets are consistent with international best practice and exceed the minimum		

Appendix 2	Appendix 2 Water Quality Detailed Audit Findings (Part 2)						
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary		
					requirements of the ADWG. Disinfection is often started in the raw water, pre-filtration, to provide the longest practicable inactivation period for each plant. For most plants the CT for free chlorine is above 160 mg•min/L, aimed at achieving 99.9% Giardia reduction. SW typically disinfects to ten times the ADWG recommended dose and, therefore, clearly more than meets its implied obligations under its operating licence. The lowest estimated CT produced by any of the SW plants was a lower bound estimate of the frequency distribution (histogram) that was still more than double the ADWG guideline value. This lowest CT was at the massive Prospect WFP which appears to have a CT typically around 70 mg•min/L but can drop to around 40 mg•min/L: still a good CT, way above the ADWG recommendation. Each disinfection system has its chlorine residual and pH monitored continually. Plant shut down is triggered on both a minimum (insufficient) and maximum (excess) chlorine concentration – this value varying by plant based on engineering assessments of the appropriate limits under each circumstance. The dead time before action is only a few minutes. Disinfection is measured shortly following dosing to help control the dosing system as well as after the completion of a significant amount of contact. Sydney Water is continuing to review and improve its primary disinfection but is now at the point of focusing more on improving residual disinfection since the primary disinfection is evidently effective and reliable. SW is currently looking at a move to CT reporting at plants. In depth (sample site: Orchard Hills WTP site). At the audited site, the location of instruments for monitoring free chlorine and pH and their point of draw off of water as well as the location of sample taps for grab samples to verify disinfection efficacy were appropriate and would give rise to readings that would be representative of the water being supplied. In addition to residuals being analysed, the chlorine flow rate was being measured continually and		
					to meet specifications. On the day of audit the instruments were reading at levels consistent with one another and well within the stated plant targets and at best practice values, e.g.: treated water total chlorine in the rising ma		
Appendix	2 Water Quality Detailed Audit Findings (Pa	rt 2)					
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Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary		
					of 2.21 mg/L when read on the instrument, 2.12 mg/L when read on the SCADA about 30 mins later. <b>Conclusion</b> The SW primary chlorination target would readily inactivate 99.99% of all relevant human infectious waterborne enteric viruses and bacteria and would achieve good to high reductions (90 to 99.99%) reduction in Giardia. Given that the water in Sydney is well-filtered, disinfection would be very effective. It is clear that chlorine-sensitive pathogen (viruses and bacteria) removal across the disinfection plants operated by SW would be excellent, comfortably over 99.99%, based on both established USEPA tables and the most recently completed and as yet unpublished studies, the latter being more conservative than the former. Given the nature of the source waters supplied by SCA, there would be no realistic likelihood of a waterborne disease outbreak or of any significant adverse health consequences arising from such pathogens for drinking water consumers with water treated to such		
				Full	high standards. Application of the ADWG to residual disinfection		
					<b>Overview</b> Sydney Water has continued to improve its residual disinfection for many years and has multiple ongoing programs aimed at further ongoing optimisation and improvement of its residuals. SW has achieved an impressive level of residual penetration throughout its massive distribution network. Both upper and lower target values are set which helps to keep residuals in the mid-range – to control microbial activity whilst minimising disinfection by-products and related taste and odour perceptions. Internal targets (WPIMS5274 Triggers, Notifications & Actions for Adverse WQ Results) for residual disinfection are appropriate. SW targets at service reservoirs (0.8 mg/L chloramine or 0.4 mg/L free chlorine) and taps (0.6 mg/L chloramine or 0.2 mg/L free chlorine) are best practice values, balancing sensitive customer interests with public health objectives. In general chloramine is used which minimises disinfection by-products and penetrates much more effectively than free chlorine. This is consistent with the ADWG which recommends		

Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary
					achieving approximately 0.2 mg/L as a residual disinfectant target to the point of supply which makes SW's target compliant with the ADWG. For practical reasons, no water supply can achieve 100% residual disinfectant above 0.2 mg/L 100% of the time at 100% of sampling points. However, Sydney Water gets very close and continually improves its performance in this area in a manner consistent with international best practice.
					Chlorine is boosted at some locations using dosing systems and tablet dosing with mixing. Chlorine is regularly monitored in the network and in service reservoirs with some service reservoirs having telemetered on line monitoring systems. Given the current good status of disinfectant residuals in the system SW is clearly at national best practice in relation to secondary disinfection. The use of tablet dosing with mixing at some locations is an effective and lower cost approach to boosting residuals but is not strictly speaking best practice relative to the use of in-line continuous dosing, residual analyser controlled. However, importantly, the use of mixers takes away the major limitation of tablet dosing when applied elsewhere, which is that mixing is hard to achieve.
					In depth (sample site Inspected Reservoir 1 (IR1)).
					The inspection of IR1 included a review of the on line analyser at that site. The residual was reading 1.2 mg/L total chlorine on the day of the inspection, consistent with the targets set internally by SW.
					Conclusion
					SW is at international best practice with respect to its achievement of secondary residual disinfection. The levels targeted and their compliance would provide multiple benefits to customers, for instance:
					<ul> <li>Provide an effective secondary barrier to traces of bacterial ingress entering via service reservoirs or following repairs and minor negative pressure transients.</li> </ul>
					• Help control microbial activity that would be associated with microbial influenced corrosion (MIC) of assets, both those owned by SW and the customer plumbing (limiting for instance 'blue water' copper corrosion which is a very costly problem for customers in areas with low chlorine residuals requiring sometimes full plumbing replacement).

Appendix	2 Water Quality Detailed Audit Findings (Pa	irt 2)			
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary
					<ul> <li>Help control microbial taste and odour formation (e.g. musty, pondy odours from geosmin and MIB arising from bacteria in biofilms).</li> <li>Help control growth of opportunistic pathogens (e.g. Legionella spp. bacteria, Mycobacteria spp. bacteria and amoebic protozoa) which are important emerging issues in the sector and a current international area of uncertainty.</li> </ul>
				Moderate	Application of the ADWG to water storages Overview Sydney Water maintains closed treated water storages, including clear water storages at drinking water treatment plants. The use of closed storages is one barrier to re-contamination of the water supply, with the residual disinfection providing an additional barrier (noted above) controlling nearly all the bacterial pathogens that might arise should recontamination occur. Hence the maintenance of the closed reservoir barrier is considered a priority by SW and this is consistent with the ADWG. SW has appropriate design criteria for new reservoir roofs. With respect to security, SW has employed a number of physical barriers and alarms. Reservoirs are inspected weekly to monthly (risk-based) in accordance with G12 Site Security Inspections – Civil Maintenance and approximately quarterly using a Reservoir & Site Inspection Checklist. These inspection frequencies are risk-based and appropriate. The inspections cover all physical site security and assess general condition, such as drainage and debris. The site-criticality is assessed annually allowing inspection and it was noted that SW has invested in making tank roofs readily and fully inspectable – an important initiative for which SW should be commended and something often absent at many other utilities. These multiple levels of security protect the reservoirs from persons contaminating the reservoirs by firstly making it physically difficult and then providing alarms to allow SW to be rapidly alerted to any human presence. The resulting controls were considered by the auditor to be a reliable means of protecting reservoirs from direct contamination by humans. It was noted that the priorities for the SW G12 and reservoir inspection forms

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					<ul> <li>(P1 to P6, low to high) had a different order from the priorities for the detailed asset inspection forms (P4 to P1 from low to high) which may cause confusion.</li> <li>Some issues relating to security have been identified, however given the need for practicability in control, the controls in place by Sydney water were considered to be appropriate.</li> </ul>
					With respect to protection from recontamination due to ingress (runoff and vermin), residual disinfection was discussed above and found to be excellent providing excellent protection against realistic quantities of bacterial contamination that might arise from trace levels of faecal ingress. It is not practicable to achieve 100% protection against trace ingress 100% of the time at 100% of reservoirs and, therefore, SW's determination and active work to maintain residual disinfection as a secondary barrier in this regard is commended.
					SW did not have such clearly defined targets for physical protection of its older reservoir roofs. The ADWG recommend the setting of target criteria and critical limits for preventive measures to control identified hazards. The ADWG recommend that operational monitoring, reporting and corrective be applied to manage risks through these preventive measures. For some hazards, physical barriers are the only preventive measures to control contamination entering service reservoirs. Even for bacteria, residual disinfection is a secondary barrier to contamination entering reservoirs and the ADWG promote the maintenance of robust multiple barriers in the protection of risks associated with pathogens. Therefore, it is recommended that clear target criteria and, if applicable, critical limits, be set for the physical ingress protection preventive measures for water tanks.
					The inspection frequency for tanks, and the multiple levels of independent inspection was excellent. In that respect, the operational monitoring processes appear to be largely in place. Furthermore, the efforts to which SW has gone to make tanks readily inspectable, such as the installation of walkways and ladders, is excellent and is way ahead of many utilities where it is not in fact practicable to safely inspect water tank roofs at a reasonable frequency. However, review of the inspection forms used (for the weekly/monthly security inspections (G12), the quarterly asset inspections

Appendix	2 Water Quality Detailed Audit Findings (Pa	art 2)			
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary
					(WR5) and the periodic diving inspections), revealed some limitations with respect to specificity of the target criteria that were not consistent with the intent of the ADWG in terms of setting measurable criteria for preventive measures. For instance:
					• It wasn't clear what grade, standard and quality of mesh was required to bird-proof vents, in order to assess whether or not the mesh was in place where it should be.
					• Clear criteria were not in place for hole size to allow the need for bird- proofing on any specific ingress point to be assessed objectively i.e., in plain language, were there any holes bigger than x mm that may be large enough to allow particular vermin to enter the tank that were not securely bird-proofed?
					• There was no evident standard on smaller holes through which runoff might arise, such as screw holes, gaps in patches, entry holds for conduits etc., and how many and how large, etc., would be tolerated at a water tank – in order to recommend rectification.
					• It wasn't clear what extent of debris was considered too much on top of tanks, noting the drainage of tanks is impacted by such litter, in order to action cleanup.
					• The inspections do not explicitly require a risk of ingress to be assessed, i.e., in plain language, was there a risk of water flowing into the tank from the roof during rain events, by whatever cause?
					Although it may be difficult to set precise criteria in all cases, more than the current level of detail and/or more training of inspectors is probably required to meet the intent of the ADWG.
					In depth (sample sites Inspected Reservoirs 1, 2 and 3 (IR1, IR2, IR3 respectively))
					The inspection of the three reservoirs identified no major and obvious breaches of good practice in that:
					fences were intact;
					<ul> <li>site access gates were locked;</li> </ul>
					<ul> <li>ladder access gates were locked;</li> </ul>

Appendix	2 Water Quality Detailed Audit Findings (Pa	rt 2)			
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary
					<ul> <li>hatches were locked;</li> <li>hatches were raised to allow drainage to flow around and rather than into the hatches;</li> <li>hatch roofs were overhanging the hatches to direct rainfall around the matches;</li> <li>there were no missing roof sheets or large holes in roof sheets;</li> <li>there were no directly overhanging branches;</li> <li>roof sheets were not evidently corroded or porous;</li> <li>most screws were in place;</li> <li>where accessible and inspectable, bird proofing mesh was found to be intact and firmly in place;</li> <li>there was no visible vermin in or on the water tanks;</li> <li>there was no evidence of illegal entry to the sites; and</li> <li>sampling taps were appropriate located and clearly labelled.</li> <li>However, consistent with the general observation about a lack of specific standards, some items were not at best practice and it wasn't clear if this was considered acceptable by SW or merely reflected a lack of precise standards. For instance:</li> <li>A number of roofing screws were drilled into the bottom rather than the top of corrugations which would provide some opportunity for ingress once the rubber seal had degraded.</li> <li>Some roofing screws were missing which created holes in the roof and in some cases these would allow some runoff to flow into the tank.</li> <li>Some rubber seals around the roofing screws had either degraded away or were never present at some points and this would allow some ingress at some points.</li> <li>A direct hole in the roof existed in one of the inspected reserviors to allow the (no longer used) depth gauge wire to enter the tank which would allow runoff from the immediate surrounding plate to enter the tank and may allow vermin entry.</li> </ul>
					• Many patches were visible in one reservoir roof. It wasn't clear what these

Clause	Operating Licence Obligation	Rick	Target for Full Compliance	2010/11	Auditor Commentary
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					<ul> <li>were for but these appeared vulnerable to possible ingress.</li> <li>Drainage would be good from IR2 and IR3 but would be limited from IR1. The IR1 reservoir included a 'kick board' around the rim of the tank walkway that was of the order 60 mm in height, yet the lip around the hatches and tank walls was only of the order 10 mm and 30 mm, respectively, in height, and the lip around the hatches was quite corroded. The opportunity for drainage to take place underneath the kick board varied around the circumference of the tank but was generally limited to between virtually nil to just a few mm. This limited drainage would be readily blocked by quite modest levels of litter and in large storms may be hydraulically unable to adequately drain the roof and prevent ingress into the tank, particularly via the hatch lip. It wasn't clear why adequate drainage had not been put in place.</li> <li>IR2 and IR3 roofs were largely free of debris but IR1 had started to build up significant levels of tree debris. The debris at IR1 were not new and had become matted and appeared to be sufficient in its extent to significantly inhibit drainage via the already very limited opportunity for drainage from the tank (see above point).</li> <li>In the past all of the inspected tanks clearly had some kind of end caps placed below the arches of the corrugations. However, these end caps had largely fallen out and/or corroded and were no longer practically effective and hadn't been maintained or replaced. The inspection checklists viewed mentioned matters such as bird proofing but did not explicitly consider end caps. Since the loss of end caps was so obvious, it appears that end caps are either not inspected and/or are considered not to be required. If so, this needs to be explained and justified since the end caps might have been there to stop vermin entry and/or to stop water beading back along the shallow gradient of the overhanging roof from flowing into the water tank and/or some other reason. There appears to be a difference h</li></ul>

Appendix	2 Water Quality Detailed Audit Findings (Pa	art 2)			
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary
					<ul> <li>diameter. It's not known what the bird entry hole size would be but a hole diameter of around 3 cm ø or above is recommended for bird nest boxes (see for instance http://www.wild-bird-watching.com/Building_Bird_Houses.html). It was noted that for new reservoirs, the SW design criteria now in use appear to eliminate the need for end caps (drawing provided for roof replacement at Woonona Reservoir (WS0262) plot dated 18/03/2011 file name WS0262-51_A.pdf). Therefore, it appears that the issue of end caps only applies to existing reservoirs.</li> <li>A review of the inspection records for IR1 revealed that many of the above issues and a number of other issues had been identified during inspections that took place during the audit period. On 7 April 2011, which ranked issues from priority P4 (lowest) to P1 (highest). Key points were:</li> <li>Roof: P3, gutters were "blocked with leaves".</li> <li>Sediment depth: 5- 30 mm and including "foreign matter".</li> <li>Entry hatch: P2 "very bad rust/corrosion".</li> <li>Bird proofing: P1 [but didn't explain what the issue with bird-proofing was]. It wasn't clear why the loss of end caps wasn't noted during the asset inspection and it wasn't clear what the issue, such as debris on the roof, that had not been addressed some six months later during the field audit (September 2011), and it is noted that the worksheet had not yet been captured within the SW maintenance recording system and was still on hard copy. The inspection item 'Walkways' was marked "N/A" for IR1. However, there was a walkway present and the issue of debris and drainage would logically have been notcured a long time prior to the audit period (2002 and 2005) and identified a P1 issue under "walkways" noting that these did not have adequate drainage and contaminated water was flowing back into the tank. This issue appears to have been addressed long ago and wasn't directly relevant to the current audit of the two reservoirs but the same issue should have at least been checked for the IR1 and not mark</li></ul>
		1		1	For the tanks inspected, records of inspections for the monthly inspections

Appendix 2 Water Quality Detailed Audit Findings (Part 2)	
Clause     Operating Licence Obligation     Risk     Target for Full Compliance     2010/11       And     Audit     Audit       Scope     Grade	Auditor Commentary
conducted using for forms WRS were e demonstrating goo schedules. No issues were not roof (missing screw screws and holes o it was likely that th missing at the mos just how many mis No debris was note leaves and debris) The most recent m under G12 check it and roof drainage have been present audit at level that the kick plate (15th much debris is too the drainage arisin the monthly, quart No inspection repo nor do any of the i it was noted that C. was noted at the C audit report isn't d <b>Conclusion</b> SW was at internat secondary residua of the water tanks the ADWG, the ne pathogen ingress,	orms G12 and the quarterly inspections conducted using examined. SW was readily able to provide these records od record keeping and good compliance with the inspection ted in relation to the check item WR5 20 (Check condition of ws / bolts – any holes)) and yet there were some missing on the day of audit (as noted above), albeit a small number. here would have been some missing screws and small holes st recent quarterly inspections illustrating that it is not clear ssing screws and holes constitutes a reportable item. ed for IR1 inspection item 15 (Check roof and drainage for at the most recent quarterly inspection (7th June 2011). nonthly G12 inspection form for IR1 had no issues raised tem 6 "Check roof hatches and sheeting are secured, roof for leaves and debris" (29th August 2011). Debris might not t at that time but it was certainly present upon the date of at would impede drainage through the narrow gap below h September 2011). Once again, it is not clear just how o much, but just as importantly, the fundamental issues with ag due to the roof design of IR1 were clearly being missed by terly and in depth (nominally five-yearly) inspections. ort seen noted the missing end caps below the corrugations, inspection forms explicitly require this to be checked. taps were missing on some of the sample taps – this item Orchard Hills audit and was discussed in that section of this discussed again here.

Appendix	2 Water Quality Detailed Audit Findings (Pa	rt 2)			
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary
					appropriate. For new reservoir roofs, SW appears to have designed out possible issues associated with ingress of birds and vermin as far as practicable. However, for the existing tanks, specific 'target criteria' and 'critical limits' were not adequately specified for these preventive measures making it difficult for inspectors to reliably report the potential loss of barriers to vermin entry and runoff ingress.
				Full	<ul> <li>Application of the ADWG to network repair and maintenance and control of materials in contact with water</li> <li>Overview</li> <li>The ADWG require that materials in contact with drinking water be fit for that purpose. Sydney Water has put in place robust systems, and these systems are being further improved, to ensure that only suitable materials are used in the construction of its assets. Products need to be approved by SW for use within its water supply. The products don't merely need to be AS 4020, AS 3500, WSAA Code etc., compliant, they also need to meet SW's requirements. Only products approved by SW can be used for any works carried out on the SW system. The criteria for approving materials are various but includes water quality management aspects.</li> <li>In addition to setting criteria, SW includes compliance with its requirements as part of specifications for contractors, and carries out inspections/audits using its DWI group, previously its civil delivery group (this changed during the audit period). Inspections are performed on all works so that 100% of developer works are checked at various stages by SW staff (pre-connection, following connection and during construction) and by approved coordinators who sign off each job. SW's own works are regularly audited.</li> <li>The ADWG require preventive measures to be put in place to control significant hazards and requires those preventive measures to be monitored</li> </ul>
					and corrective actions taken if there are breaches. SW was found to be using national to international best practice in relation to the control of these civil works.

Appendix	2 Water Quality Detailed Audit Findings (Pa	art 2)			
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary
Scope				Grade	<ul> <li>Scheduled replacement and installation of new water mains is carried out by developers, contractors and SW staff.</li> <li>Sydney Water has strong controls on the quality control of developer-installed systems (WPIMS5027 SOP Disinfecting Water Mains and record WR16 Water Main Flow Test and Disinfection Analysis Report for Internal Samples). The controls include flushing for typically 15 to 20 minutes at a suitable flow rate sufficient to yield around a 1 m throw from the hydrant (nominally based on 480 L/min flow rate). Chlorine is dosed to 20 ppm with residual tested at one point in the system using a KI visual comparator assay. The main and all service connections are flushed to bring the super-chlorinated water through. The chlorine is held for 24 hours then discharged. Discharge continues until a colourimeter DPD test picks up a low enough residual. The West Ryde lab separately tests the water for E. coli, total coliforms and turbidity. The staff that undertake the process are required to first complete a chlorination course. The work plan coordinator allocates staff to jobs and needs to decide if staff are suitable to undertake jobs. The result is that for developer works, SW requires 100% of works to be super-chlorinated. Until the testing hold point is passed, the works are not considered ready for connection to customers. This process is consistent with international best practice for ensuring microbial contamination is adequately controlled. SW is currently reviewing the use of ozone to avoid the need to use chlorine as part of its continuous improvement process.</li> <li>For replacement works, SW has more control than for developer works because it uses an alliance process to manage and deliver the work more directly. Therefore, if all other controls are shown to be in place, super-chlorination is not required and a different process is used (WPIMS268 SOP Commissioning of Water Main Renewals by Networks Alliance). The other controls that must be working include pipes being ≤ 200</li></ul>
					flushed with a flushing velocity creating at least a 1 m throw from the hydrant for at least 20 mins. For larger mains, and absent these conditions being met.

Appendix	2 Water Quality Detailed Audit Findings (Pa	art 2)			
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary
					the above super-chlorination procedure is required. Each job is tested, not as a hold point, but as part of ongoing quality assurance and process verification. Lab tests are undertaken and in addition field staff are to view the appearance of the water using a glass container against a white background and to smell and taste the water. The lab tests and the field tests are entered into a combined record (WR15). The temporary supplies, if required, are only used once, so that only new materials are used. White rather than black/blue pipes are used if areas are heat-exposed to help keep temperatures down. This approach sets national best practice.
					For burst repairs, the crews use dedicated water rather than combined sewer and water service vehicles. The SWM20 procedure sets out the need to pump out and keep trenches as clear as practicable, to avoid contamination by soil, to use bi-directional flushing if practicable and to flush until clear with a minimum of 15 mins with a 1 m throw from the hydrant. Chlorination is not routinely required unless there are site contamination issues, such as where both water and sewers burst and the water assets are contaminated.
					In depth: Hermitage Depot interview and site inspection in Drummoyne area.
					Staff involved in super-chlorination appeared to be fully cognisant of the importance of their work and of how to undertake the work in a manner that protected water quality. Staff involved in field works were well able to explain the procedures adopted and their explanations were consistent with the documented procedures. The conditions of works visited was consistent with the practices in the procedures, to the extent that such matters could be assessed. For routine burst water main repairs water quality was said to be controlled using SWM 20, consistent with the corporate position. The person interviewed indicated clearly that in no way was there any incentive to rush the work or take short cuts such that water quality controls could be compromised, e.g. to meet customer response time targets.
					Conclusion
					SW is setting national best practice and conforming to international best practice with respect to its network replacement and repair works and its acceptance of developer works, consistent with the intent of the ADWG.

Appendix	ppendix 2 Water Quality Detailed Audit Findings (Part 2)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary			
				Full	Application of the ADWG to control of chemicals used in drinking water Overview			
					The ADWG require that chemicals used in drinking water do not contaminate drinking water and are effective for their purpose. A whole chapter (Chapter 8) covers how this can be done. SW played a key role in the development of Chapter 8 of the ADWG and was found to have best practice systems in place for managing these issues. Contracts are put in place for chemical suppliers and these include specifications for chemical impurities. SW has worked out in detail, and given the nature and use of each of its treatment chemicals, and safety factors, the tolerable concentrations of particular contaminants. The resulting specifications form the contract specifications for suppliers. SW has pushed the suppliers as far as practicable to comply with its requirements and pushed for appropriate batch testing by independent labs. In practice, this is an ongoing process as chemical suppliers have been found to be pushing back on this requirement and the suppliers have some oligopoly and near monopoly power within Australia. However, SW has already come a long way and appears to be driving national best practice in this area. In addition, SW tests the final water for a broad range of substances which would include substances given in the ADWG that may relate to treatment chemicals. SW also test some received treatment chemicals. In practice results aren't always available until after the water has been supplied, but the process provides a strong check as part of good quality assurance.			
					In depth: Orchard Hills WTP.			
					At site, the chemicals stores were clearly labelled and operators explained how all deliveries were met on site to check documentation and complete necessary documentation checks. Day tanks were used for fluoride to cap the maximum risk that could arise from over-dosing. Chemicals were checked with respect to dose rates, final measured concentrations and stock usage rates to provide multiple means of confirming that chemicals were not being overdosed.			
					Conclusion			
					SW is setting national best practice and conforming to international best practice with respect to its drinking water treatment chemical management			

Appendix	pendix 2 Water Quality Detailed Audit Findings (Part 2)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary			
					from a water quality perspective.			
				Full	Operational monitoring and corrective actions			
					Overview			
					<ul> <li>The ADWG specifically mention the need to maintain monitoring equipment.</li> <li>This item was not audited in detail because the ISO 9001 audit was shown to review this item in depth and this item is within the scope of the ISO 9001 audit. However, it is important to note that SW is held to account in relation to this item through its internal and external ISO 9001 audit at the corporate level.</li> <li>The ADWG recommended the setting of target criteria for specific preventive measures as well as the setting of exceedance criteria for verification monitoring parameters. The document WPIMS5274 Triggers, Notifications &amp; Actions for Adverse WQ Results sets out the target criteria for both operational and verification monitoring parameters. The document WPIMS5274 Triggers, Notifications &amp; Actions for Adverse WQ Results sets out the target criteria for both operational and verification monitoring parameters. The document is more than a simple list of target values. The target values are evidence-based. The supporting calculations behind the values used for bulk water interface points, for instance, was provided and was found to be sound. Overall, the document is excellent in that the values used are sound and clear, the information is evidence-based and a very broad range of parameters is covered. The only weakness is in relation to the target criteria for items that are not readily amenable to simple measurement, such as the criteria relating to protection of water tank preventive measures (noted above and not considered under this item).</li> <li>The ADWG require monitoring signals to be monitored continually where practicable for critical limits. Alarmed systems are set up to monitor 24/7 on the main plant monitoring instruments (IICATS and WFP SCADA).</li> <li>The ADWG require corrective actions to be taken in response to exceedances. In addition to the alarm systems for SCADA, grab samples trigger alerts when</li> </ul>			
					exceedance values are entered into the laboratory systems.			
					In depth: Orchard Hills WTP.			
					I he approach taken to calibration of instruments was found to be excellent. Staff recorded the pre- and post-calibration results on record sheets. The			

Appendix	sendix 2 Water Quality Detailed Audit Findings (Part 2)							
Clause	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11	Auditor Commentary			
And Scope				Audit Grade				
					record sheets had stated tolerances. Calibration was performed at varying frequencies, depending on the instrument, and the results of pre- and post-calibration were recorded electronically to allow ready interrogation of the results. In addition to checks and calibration being performed at the plant, the West Ryde labs played a key role in managing the supply of standards and calibration of the instruments used at the plants. This supporting calibration of the instruments and the daily checking and cross checking by plant operators and the laboratory assures a high level of reliability in the instruments used at the treatment plant. The operators interviewed had a good understanding of calibration and its importance. Instruments were checked during the site audit and were found to be operational. The monitoring equipment appeared to be reading consistently between instruments and between wall displays and SCADA.			
2.1(b) Audit	Sydney Water must prepare, to the satisfaction of NSW Health, a Five Year Drinking Water Quality Management Plan covering the entire five year term of the Licence. The Five Year Drinking Water Quality Management Plan must be in operation by 31 December 2010 and include strategies for the comprehensive management of the quality of Drinking Water in Sydney Water's water supply system in accordance with the Australian Drinking Water Guidelines (unless NSW Health specifies otherwise).	High Risk Shortcomings in the Plan could lead to failures in water quality and serious and widespread health effects	The plan must be in operation and approved by NSW Health by the due date. It must include a comprehensive range of drinking water quality management strategies that are consistent with ADWG, result in improved water quality management and provide timeframes, cost estimates, milestones, and specific, quantifiable, auditable targets.	Full	The 5 yr DWQMP for 2010 to 2015 was prepared in good time and approved on time by NSW Health. The document sets out the overall management of drinking water quality. The document is appropriately set at the strategic level. The document reads well, is well-structured and is of a good length. The document sets out clearly the way in which Sydney Water has implemented the 12 Element ADWG Framework. The summary is reported at the Component and Action level of the Framework. The interpretation of the Framework by SW – that is, the way in which the DWQMP references how SW's activities meet the intent of the Framework - appears to be appropriate. All aspects of the ADWG Framework are captured. It is clear that at the corporate, high level, Sydney Water has fully implemented the intent of the ADWG Framework and is in compliance. The SW water quality vision is set on page 7 of the DWQMP. The vision is reasonably ambitious but it was evident during the audit that SW is operating in a manner wholly consistent with that vision, both at the higher levels and at the shop floor level, as observed during the deeper parts of the audit. For instance, SW claims that its vision includes "keeping up-to-date with the latest scientific and technical knowledge in drinking water quality and applying it to			

Appendix	Appendix 2 Water Quality Detailed Audit Findings (Part 2)								
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary				
					our operations". The information contained within the DWQMP (e.g. the NDMA, chlorate, health-based targets (DALYs), climate change, security and many more) demonstrated that SW was indeed fully aware of relevant emerging issues and had acknowledged these and them. Key SW staff appear to be well networked into the international drinking water quality community of practice which provides SW with intelligence in relation to emerging issues and improved ways of achieving objectives. SW was found to be setting national best practice in some areas (e.g. chemical quality assurance and control for water treatment chemicals) and complying with international best practice in many areas.				
					It was not considered necessary to reiterate in this audit report the way in which SW has implemented the ADWG Framework since the DWQMP does that at Table 1 of the document. Other parts of the audit then tested the extent to which SW had conformed to what the DWQMP stated was happening. It was noted when interviewing the principal author of the DWQMP that significant consultation had taken place within SW to ensure the accuracy of the document. The audit found that, to the extent that this could be assessed, the DWQMP did faithfully reflect the situation in the field.				
					The connection between the operational level and the strategic DWQMP level is the Water Product Information Management System which cascades down through SAPs, SOPs, forms, checklists etc. The WPIMS is audited under the ISO 9001 audit. A recent external audit report was sighted (August 2011 audit by Global-Mark for ISO9001 certification). The audit is not water quality "technical" but does broadly cover the scope of the WPIMS. Procedures and forms were registered, formalised documents that were called up as part of the WPIMS. Some procedures were corporate; others were developed for specific sites. SW was meeting or exceeding the requirements of the ADWG with respect to documentation, records management, training and HR management in general through the use of its ISO 9001 system. A criticism of the ISO 9001 system, as with any quality management system, is that it is a				
					generic system. Whilst that's true, it wasn't considered necessary during this audit to re-audit the scope of the ISO 9001 system which allowed the IPART audit to focus instead on the technical aspects of the ADWG that are not assessed under ISO 9001.				

Appendix	vendix 2 Water Quality Detailed Audit Findings (Part 2)							
Clause And	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit	Auditor Commentary			
Scope					SW began its catchment to tap risk assessment in 1997, prior to the ADWG Framework even being thought of, and has considered to regularly update its assessments. The most recent assessment occurred within the Audit period, in October 2010, and involved NSW Health and the SCA. The approach adopted was consistent with SW's "AMQ0012 Water Quality Risk Management Processes" document which links water quality risk assessment to water quality management and the 5 yr DWQMP.			
2.1(c) NR								
2.1(d) Audit	Sydney Water is to implement procedures and processes for the appropriate management of the Drinking Water supply system under its control in light of its knowledge of the entire Drinking Water supply system (from the source to the consumer). Sydney Water must have adequate systems and processes in place to manage Drinking Water quality taking into account planning and risk management and their implementation across the entire Drinking Water supply system.	High Risk Shortcomings in water quality management procedures could lead to failures in water quality and serious and widespread health effects	Water quality management procedures encompass the entire system (source to consumer), take account of liaison with bulk suppliers in key areas (such as planning, risk management and emergency response), are comprehensive, established, implemented, and well communicated to and understood by relevant personnel through training programs.	Full	The relationship between SW, BOO plants, SCA and NSW Health appears to be well-developed at the operational level. SW, SCA and NSW Health takes part in both JOG and SLG meetings quarterly. The minutes of these meetings were sighted and all four of each meeting took place during the audit period. The minutes showed that the meetings specifically consider water quality. There were quarterly operations interface meetings held between SCA and SW, including BOO operators where applicable. An example of the Woronora Interface meeting March 2011 minutes was provided to illustrate the contents of these meetings. The meetings specifically consider water quality. There are bimonthly Water Forum meetings between plant operators, SCA, BOO operators where relevant, network operators and water quality personnel to discuss and review water quality performance. These meetings discuss water quality from a catchment to tap perspective. Water quality performance is reviewed using control charts and assessment of performance is undertaken monthly against specific water quality targets. These meetings appear to be nucleated by SW and are an excellent initiative to work on water quality in a holistic manner, as promoted by the ADWG. A number of joint initiatives are taking place, linked to these forums, including stress testing of plants to review and revise raw water triggers. The staff interviewed had confidence in the ability of SCA to notify SW early in the event of foreseeable adverse events using its SCARMS system and other tools. The Catchment-to-tap Risk Assessment is undertaken jointly by SW and SCA, including input from NSW Health and any relevant BOO plants. A recent			

Appendix	Appendix 2 Water Quality Detailed Audit Findings (Part 2)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary			
					<ul> <li>update was completed during to the audit period (copy provided dated 22/Oct/2010). The assessment was independently facilitated. Some risk assessments have been completed for the desalination plant but the overarching Catchment-to-tap Risk Assessment has not specifically been updated to reflect the introduction of desalinated water. The timing of the introduction of the desalinated water appears to have occurred in between the major risk assessment cycles (5-yearly detailed review, 2.5-yearly midterm periodic review) and so the next update is planned to occur at the midterm review. With hindsight it might have been better to have completed a special update to take into consideration to the SDP, given its high volume contribution to the potable water supply.</li> <li>There is a SCA and SW Bulk Water Supply Agreement which is currently being renegotiated. Some issues were identified with the agreement but these were all being reviewed and revised as part of the revised agreement.</li> <li>There is a Water Supply Agreement between Sydney Desalination Plant (SDP) and SW (28th June 2010). The document includes testing requirements (Ex A) and water quality specifications (Ex B). The document was reviewed and appeared to be appropriate with respect to the water quality specifications as against the ADWG.</li> <li>SW undertakes incidents with its bulk supplier, for instance the Scenario Debrief for Exercise Black Christmas was reviewed and this involved joint SCA and SW exercises relating to water quality and other issues.</li> <li>In conclusion, SW appears to have suitable agreements in place with its bulk suppliers and is in the process of revising and improving its agreement with SCA.</li> </ul>			
2.1(e) Audit	Sydney Water must comply with the fluoridation plant operating targets set out in the Fluoridation Code.	Moderate Risk Short term variations would not necessarily have health impacts.	Compliance with Code targets; appropriate risk assessment, monitoring, checking and follow-up of non-compliances; procedures and training to ensure that compliance is achieved and incident responses are in place.	Full	Overview Sydney Water recently completed internal audits of compliance against the Fluoridation Code (reports were sighted for various plants using the forms Audit Checklist – Sydney Water & BOO Water Filtration Plant – Compliance to NSW Health Fluoridation Code of Practice and Sydney Water Audit Checklist For Compliance to NSW Health Fluoridation Code Of Practice March 2011 Revision). These audits were formal and in depth, visiting each site, albeit internal audits. The audits included some that took place during the period			

Appendix 2 Water Quality Detailed Audit Findings (Part 2)								
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary			
					covered by this audit. These internal audits represent an excellent initiative and the completed audit reports were provided to this auditor. Since the internal audits completed by SW appeared to be credible, and since the Orchard Hills WTP fluoridation processes were audited on site as a sample, it wasn't considered necessary to further audit this item. The Code does not specify on-line meters. However, the fact that some plants have them and some don't needs to be reviewed and explained.			
					In depth: Orchard Hills WTP. Fluoridation was audited at Orchard Hills WTP. The dosing system included duty and standby pumps, use of a day tank that only contained a limited volume of fluoride to reduce overdosing risk, the use of a pumped rather than gravity feed to reduce the overdosing risk and the presence of on line fluoride monitoring with alarms. Testing included daily grab sample bench testing at the plant along with daily laboratory testing at the lab. All three results (bench, lab and on line) were compared to one another. The daily lab results were reported monthly to NSW Health. The bench test instrument was calibrated daily at high and low points and checked against a mid range sample. Calibration standard batch numbers were recorded. Data were recorded on a form and stored electronically. To the extent that this could be assessed on site, the plant appeared to be fluoridating in accordance with the fluoride code. <b>Conclusion</b> SW appears to be fully and actively complying with the Fluoride Code and continually improving its activities in relation to water fluoridation.			
2.1(f) Audit	Sydney Water must report on Drinking Water quality monitoring in the manner and form outlined in the Reporting Manual.	Moderate Risk This is reported to IPART who check reports	Reports provided within time and format requirements in the Reporting Manual.	Full	Sydney Water has a Drinking Water Compliance Monitoring Plan that is used to ensure that it's monitoring and reporting meets the NSW Health requirements. Quarterly reports are submitted to NSW Health. All reports for the audit period were sighted and their submission dates complied with the reporting manual requirements. One of the quarterly reports was examined in detail (4th quarter – which included the rolling 12 months). The number of samples is reported for each water supply system and SW sets the number of samples for each water quality zone by direct reference to the ADWG. The On line Water Quality Notification System is used to keep NSW Health			

Appendix	Appendix 2 Water Quality Detailed Audit Findings (Part 2)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary			
					and SCA as well as SW staff, fully across any water quality issues that come up. An example was shown from the audit period as part of the audit. On 5th March 2010 a burst water main and sewer main occurred and health was notified. The reporting system is triggered by a burst water main where evidence contamination could threaten the water main repair. Under such a situation the work included super chlorination to 40 ppm followed by E. coli, total coliform, turbidity and taste, odour and clarity testing. It was noted that dialysis patients no longer need to be registered with SW because the dialysis machines have alarms now, and the patients have privacy concerns. However, patients can opt to be registered if they wish to. In summary, reporting to NSW Health appeared to have taken place in accordance with the reporting manual during the audit period. NSW Health advised (14th September 2011) that during the audit period, the department maintained an effective and open relationship with SW at various levels. NSW Health was satisfied that no incidents reported during the audit period presented a risk to public health. NSW Health described the bushfire scenario exercise as being a very useful activity. The department had been consulted on, and approved, a number of SW documents including the 5yr DWQMP and a revised MoU. Sydney Water also provided data and assistance to NSW Health's expert panel which examined the risks associated with the use of biosolids. In conclusion NSW Health was satisfied that SW had met its obligations under the Operating Licence and MoU.			
2.2	Recycled Water (including stormwater)							
2.2 Audit	<ul> <li>Sydney Water must manage Recycled Water quality in accordance with:</li> <li>(a) the Australian Guidelines for Water Recycling (unless NSW Health specifies otherwise) to the satisfaction of NSW Health; and/or</li> <li>(b) any other guidelines specified by NSW Health to the satisfaction of IPART.</li> <li>[Note: Under clause 2.2(a) Sydney</li> </ul>	<ul> <li>(a) and (b) Very</li> <li>High risk</li> <li>Failure to</li> <li>comply with</li> <li>guidelines</li> <li>could lead to</li> <li>serious health</li> <li>effects</li> <li>(c) Moderate</li> </ul>	Consultation with NSW Health, implementation of NSW Health requirements. Management of recycled water quality is fully consistent with the AGRW or guidelines specified by NSW Health. Recycled Water Quality Management Plans have been endorsed by NSW Health and	Full	Composite Grade for the separate, in-depth components that follow <b>Overview</b> SW uses its Quality Management Plan - Recycled Water Schemes (QMP-RWS) to provide all the information generic to the management of all of SW's recycled water schemes and this has been reviewed and endorsed by NSW Health. The document is laid out in accordance with the AGWR and addresses all aspects at the corporate level. Each recycled water scheme then has its own Recycled Water Quality Management Plan (RWQMP). The RWQMP covers the system-specific aspects. Some of these plans have been completed and have been endorsed by NSW Health, such as the Rouse Hill scheme,			

Appendix	ix 2 Water Quality Detailed Audit Findings (Part 2)							
Clause	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11	Auditor Commentary			
And				Audit				
Scope				Grade				
	<ul> <li>Water will generally be required to comply with the Australian</li> <li>Guidelines for Water Recycling.</li> <li>However, where NSW Health</li> <li>considers it appropriate, it may vary</li> <li>or amend the application of these</li> <li>guidelines to take account of the</li> <li>circumstances of specific recycled</li> <li>water services provided by Sydney</li> <li>Water and/or recycled water quality</li> <li>policy and/or practices within NSW.</li> <li>Under clause 2.2(b) NSW Health may</li> <li>require Sydney Water to comply with</li> <li>a NSW guideline for a specific scheme</li> <li>such as DECCW's Environmental</li> <li>Guidelines for Use of Effl uent by</li> <li>Irrigation. In these circumstances</li> <li>IPART may seek the views of the</li> <li>agencies responsible for these</li> <li>specific guidelines or other technical</li> <li>experts to assess compliance with</li> <li>this clause.]</li> <li>(c) Sydney Water must report on</li> <li>Recycled Water quality monitoring in</li> <li>the manner and form outlined in the</li> <li>Reporting Manual.</li> </ul>	Risk This is reported to IPART who check reports	consistent with AGWR 2006 Relevant reporting on recycled water quality is comprehensive and in the manner and form outlined in the Reporting Manual.		industrial schemes and the Western Sydney Replacement Flows Project scheme. SW has also interacted with NSW Health in relation to the application of the AGWR to its irrigation schemes but has yet to complete the plans for these schemes. At the time of writing, SW has tasked a dedicated officer to complete RWQMPs for the irrigation schemes. NSW Health is satisfied with the progress by SW in relation to these schemes. In agreement with NSW Health there is a transitional and staged implementation of the AGWR. Specifically, new schemes must implement the AGWR and for existing schemes, the AGWR must be implemented starting with the high exposure dual reticulation and industrial schemes and working then through the lower exposure irrigation schemes. Furthermore, SW intends to try to complete the RWQMPs for the irrigation schemes during the current financial period. Sydney Water is committed to completion of the outstanding RWQM Plans by 30 June 2012, however, an explicit program for the completion and endorsement of the RWQMPs for all of the existing SW schemes is required to ensure adequate progress is being made. SW is currently working with customers – something that takes the timeframe somewhat out of SW's direct control – in relation to customer control of risks. This is important for the irrigation schemes since there is a reliance placed upon the customer to control risks, e.g. through restricted irrigation. If SW and/or NSW Health is not confident in the customer's ability to control such risks, SW would not supply the water and/or the level of treatment would need to be enhanced. This customer interaction makes it difficult for SW to finalise agreed timeframes for completing all RWQMPs. Nonetheless, some timeframe should be agreed. The AGWR were finalised in 2006 and it is now 2011. The completion of RWQMPs for all schemes, consistent with the AGWR, and NSW Health-approved (for health aspects), is a requirement of this licence and is something that is not yet completed. In addition to being able to demonstra			

Appendix	endix 2 Water Quality Detailed Audit Findings (Part 2)						
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary		
					being experienced. Approval of the RWQMPs cannot be delayed indefinitely until agreements are reached and the finalised management systems are put in place . Therefore, it is recommended that a timetable for submission and approval (health aspects) of AGWR-compliant RWQMPs be agreed upon by SW and NSW Health, respectively, for all SW recycled schemes.		
					It was noted by SW that in the interim, on an ongoing basis, verification monitoring continues for all recycled water schemes and this is reported to NSW Health. Furthermore, NSW Health has previously provided commentary on draft plans covering the irrigation schemes. Therefore, there is no suggestion that the risks are not being adequately managed in practice; the issue is one of demonstrable compliance with this licence requirement. Such compliance has not yet been achieved.		
					In relation to the environmental aspects, it isn't entirely clear whether there is a need for third parties to approve or endorse the RWQMPs. The schemes appear to be too small in their potential impact and too site-specific in terms of their application to trigger interest from OEH. Therefore, the customer and local government would need to be involved, as appropriate. SW does appear to undertake appropriate land capability and environmental assessments for its schemes but it is important that any relevant third parties are adequately involved, if required. That said, RW irrigation customers obtain their own land suitability assessment, and are responsible for complying with requirements or recommendations contained therein.		
				Full	Validation (Element 9 of the AGWR Framework)		
					One of the most testing aspects of the AGWR is the need to provide explicit validation with respect to pathogen reduction at treatment plants. The validation plan is included as part of the RWQMPs and is scrutinised in detail by NSW Health. Since the RWQMPs are not endorsed for all schemes, the validation plan has not been endorsed for all schemes and this item has not achieved full compliance. The requirements for validation, i.e. the pathogen log reduction values that need to be proven, are given in the RWQMPs as based on the AGWR Table 3.8 – this is appropriate. SW has agreed a validation hierarchy with NSW Health.		

Appendix	endix 2 Water Quality Detailed Audit Findings (Part 2)						
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary		
					some process steps, for instance the USEPA disinfection tables are used to credit processes with up to 4 log virus inactivation. The AGWR Table 3.4 example values are used to provide validation evidence for some process steps for some plants – this is a highly questionable approach since the AGWR Table 3.4 is purely illustrative and very approximate. However, NSW Health appears to be comfortable with the approach and (unfortunately in the opinion of this auditor) the table is present as part of the AGWR and is often used (incorrectly in the opinion of this auditor) in the way that SW have used it. Therefore, moving away completely from reference to Table 3.4 of the AGWR as a source reference is proposed here as an opportunity for improvement rather than as a recommendation. The most detailed validation for the schemes has been implemented through the STP Process Characterisation – Pathogen Reduction Rouse Hill, St Marys, Quakers Hill, and Penrith (i.e. the higher risk SW schemes). These schemes were validated in situ because (with the exception of Rouse Hill) the discharges feed to the replacement flows scheme. The in situ validation uses autochthonous E. coli, coliphage and Clostridium perfringens spores measured at the inlet, post secondary, post filters and post chlorine. Results show a high proportion of non-detects or low numbers following tertiary treatment so that the log reduction values that can be claimed are very limited. However, the approach is a sound method of proving plant performance in situ using appropriately conservative indicators.		
				Full	In depth: Rouse Hill cross-connection controls The AGWR set out the need to ensure control of risks through the implementation of appropriate preventive measures. An in depth audit was undertaken in relation to the approach used by SW to control cross- connections – this being one of the controls explicitly required to comply with the AGWR and being covered in the NSW Health-approved RWQMP for Rouse Hill. In relation to the plumbing from main to household, an audit of the plumbing controls for recycled water schemes identified that SW had managed to have the 100% three-stage inspection program - previously undertaken by the PIAS group within CCRD – continue through the same core PIAS team after the		

Appendix	ppendix 2 Water Quality Detailed Audit Findings (Part 2)								
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary				
					team was transferred into Fair Trading and then NSW Finance and Services. Without going into detail here, the three-stage 100% inspection process physically checks that there are no cross-connections and that appropriate signage, pipe colours and meters are used. The process is very technical in nature but appears to be at international best practice and certainly sets national best practice. In relation to the developer works, there is a Developer Works Inspection (DWI) team within Civil Delivery. The team was set up during March 2011 and tool over work previously undertaken elsewhere within Sydney Water. The team undertakes multiple audits to ensure that developers comply with Sydney Water's standards. Standards require conformity to WSAA codes. The audits also consider safety and environment. The team has 12 inspectors. The inspection process begins with a pre-start or early phase check during which the group consults with the SW-accredited Water Servicing Coordinators (WSC) appointed by the developers. Inspections then take place during construction and a final inspection takes place pre-connection inspection. 100% of major works (> 12 m or so length) are inspected. 20% of minor works are also audited. The WSC has a hold point and carries out a full ITP before issuing a pre-connection certificate. The DWI then provides the final pre- connection check. The group checks the purchase dockets to ensure that only approved products are being used. In addition, Recycled Water Ops conducts a 20% audit of main to meter connections. Importantly, from a risk management perspective, flow tests are undertaken during the chlorination phase of works commissioning (discussed under the drinking water part of this audit, above) at a rate of 100%, and this is a hold point to ensure no cross connections between potable and recycled water. If problems are found a CAR is raised which involves requiring a close out before the works can be approved for connection. An example was sighted in which a worker didn't have any chlorine a				
					controlled to prevent the occurrence of cross-connections.				

Appendix 2	Appendix 2 Water Quality Detailed Audit Findings (Part 2)								
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary				
					In the longer term, SW relies upon its dual check valves in the water meters and, in some systems, differential pressures, to help mitigate against backflow arising from customer-initiated cross-connections on customer properties. Customers on properties that make their own cross-connections are not protected – there is no ongoing inspection and test process on customer properties to check for cross-connections other than plumbing inspections undertaken following the completion of registered licensed plumbing works.				
					There remains a risk that a person might occupy a property previously vacated by a person that made plumbing changes resulting in cross- connections. The same risk applies to rainwater tanks and recycled water and any alternative non-potable water source on a site. The only control systematically applied by SW to limit this risk is "education and communication to explain the need to avoid creating cross-connections" (QMP-RWS). Whilst this control is all the SW can practically do, and although SW is not responsible for cross-connections arising on customer properties at any time, let alone post occupancy, we consider that there are real risks to the viability of dual reticulation schemes if these issues are not adequately managed.				
					SW is investing heavily in widespread dual reticulation schemes and has international best practice approaches to ensure no cross-connections are in place at the point of first occupancy. It is in SW's interests to promote a process to ensure that post occupancy cross-connections do not lead to adverse consequences. The difficulty for SW is that the NSW Department of Finance and Services, the plumbing and building sector at large, along with private property owners, are those responsible for managing these risks – not SW. However, the adverse consequences of cross connections (for instance, involuntary consumption of recycled water being discovered after a prolonged period by a concerned person), would impact the scheme in unpredictable and potentially very costly ways. If there are repeated problems arising with post-occupancy plumbing modifications leading to adverse consequences, it is possible the SW will be forced to feed potable water into these schemes. It is also possible that SW will need to undertake very costly alternative measures to control such risks if recycled water is to be				

Appendix 2 Wat	dix 2 Water Quality Detailed Audit Findings (Part 2)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary			
					turned on again (for instance intensive post occupancy property inspection, 100% pressure differential management, smart metering, chemical dosing (colour or taste compound) of the recycled water and potentially a variety of other approaches and combinations of approaches). At this stage, SW have advised that their root cause analyses in to existing occurrences of cross- connections is showing a low-probability of post-occupancy cross- connections. While valid to date, on-going monitoring will be required to ensure that this continues to be the case.			
				Full	<ul> <li>In depth: Rouse Hill recycled water treatment plant</li> <li>The AGWR set out the need to ensure control of risks through the implementation of appropriate preventive measures. An in depth audit was undertaken in relation to the approach used by SW to treat recycled water prior to supply through the Rouse Hill scheme.</li> <li>Below the level of the RWQMPs for each site, or at least in parallel to them, the SW quality system includes SOPs for plant operation. For instance, the RHTP 0020 Recycled Water Production SOP sets out an overview of the process for operating the plant to produce recycled water. The finer details of the plant are then provided in the Functional Design Specification (FDS). The plant is largely operated against SCADA systems that provide the final point of truth for plant operating criteria. The corporate monitoring plan managed out of West Ryde gives effect to the monitoring plan given in the RWQMP. The CCPs are largely managed via the SCADA system. The critical limits set and the validated plant performance appeared to meet or exceed any reasonable interpretation of compliance with the AGWR and would comfortably meet international best practice, such as California Title 22 requirements for similar water uses.</li> <li>The audit checked the carrying through of the NSW Health-approved RWQMP criteria through the SOP, FDS and SCADA systems. There were inconsistencies between the numerical values given in the FDS, the procedures, the SCADA and the NSW Health-approved RWQMP. For instance:</li> <li>The RWQMP sets a minimum UV dose of 30 mJ/cm2 and a target of 40 mJ/cm2 whereas the SCADA appears to require a minimum UV dose of 40</li> </ul>			

Appendix	Appendix 2 Water Quality Detailed Audit Findings (Part 2)								
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary				
					<ul> <li>equivalent dose for protozoan parasites has been thoroughly validated.</li> <li>The maximum flow through the UV unit appears to be set at 60 L/s whereas the RWQMP sets a maximum flow of 128 L/s. The flow rate would be taken into consideration in the dose calculation algorithm so this value is not particularly important in itself.</li> </ul>				
					• The FDS sets a minimum free chlorine residual ex contact tank of 4 mg/L whereas the RQWQMP and the SCADA both have a value of 4.5 mg/L as the minimum. This value ensures very effective (>> 99.99%) inactivation of almost all pathogens. On the day the plant was achieving approximately 6 mg/L.				
					• The SCADA and RWQMP were consistent with respect to the requirement for a 0.5 NTU turbidity ex filter on the combined filter effluent. On the day the plant was performing to approximately 0.2 NTU.				
					• The SCADA and RWQMP were consistent with respect to the requirement for a range of free chlorine leaving the main recycled water plant storage tank of between 2 and 7 mg/L.				
					None of these inconsistencies presented any health concerns since the SCADA values (which actually control the plant) were always more conservative than the RWQMP values approved by NSW Health. However, these differences are noted and it's important that there is awareness of precisely what NSW Health has endorsed. It is important that SW is never less conservative than anything endorsed by NSW Health since this Operating Licence explicitly requires NSW Health to approve the RWQMPs. Many recycled water and drinking water plants have the critical control points tables prominently displayed at their plants to ensure that all staff are reminded of them and to help minimise the risk of any changes being made the would breach the agreed standards. A similar level of visibility wasn't evident at the Rouse Hill plant and staff didn't necessarily have immediate knowledge of the values				
					endorsed by NSW Health. It is recommended that SW consider means to ensure a high level of awareness of the fact that NSW Health has explicitly endorsed particular critical limit criteria through the RWQMP, which is in turn called up in the Licence, an awareness of what these values are and that these values cannot be changed without due process.				

Appendix	Appendix 2 Water Quality Detailed Audit Findings (Part 2)								
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary				
					Sample points for grab samples, and sample lines for on line monitoring instruments were found to be in appropriate places and it is likely that samples would be representative of the quality of water passing each point in the process step. Automated exception reports are generated from both grab sample results and on line system alarms. The alarm setpoints and target criteria for the scheme appeared to be appropriate and were consistent with, or more conservative than, the RWQMP values. Readings were cross-checked between the instrument readings and the SCADA and found to be consistent. For instance, the combined filter effluent reading was 0.213 NTU on the instrument and then, about 30 mins later, 0.190 NTU on the SCADA. In addition, there was double validation of some instruments, with two free chlorine instruments analysing the disinfected water (these read 3.6 and 3.9 mg/L on the day of audit - reasonably consistent). One unusual observation was that the sample point for grab samples from the final chlorination step was triplicated – that is there were three parallel chlorine contact tanks and a separate sample tap was found on each tank with the same sample number. Inspection of the lab reports shows that a record is made of which tank is sampled. Furthermore, the sampling at this point is more conservative than sampling at the point of integration in the downstream water storage. Therefore, this is not considered problematic but is a highly unusual situation – the same sample site code actually has three sample sites. Another interesting observation was that the 0.5 NTU critical limit endorsed by NSW Health for the plant filtration CCP is related to combined filter effluent. With 12 filters one filter could potentially fail severely without the combined filter effluent reading breaching the critical limit. In practice, SW does have appropriate alarms and set points on the individual filters and the scheme appear to be up to 12 filters one filter could potentially fail severely without the combined filter				
					implications of this effect and whether or not some limiting value should also				

Appendix	Appendix 2 Water Quality Detailed Audit Findings (Part 2)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary			
					be applied to individual filters. Did NSW Health endorse a combined filter effluent value or an individual filter effluent value? If the former, did they fully understand that a total failure of an individual filter might occur without breaching the combined filter critical limit value, and is that an acceptable scenario? As a general topic for discussion, NSW Health should be consulted on its view about critical limit values for filtration plants: should these values apply at combined or individual filters and what values should apply at each if different? Given that dual reticulation schemes carry a proven foreseeable likelihood of water consumption, it is possible that critical limits should be applied to individual rather than combined filters when there are so many filters potentially on line at once. This issue is relevant to both potable water plants from higher risk sources/periods and recycled water plants supplying high exposure uses. In general, where a plant needs to achieve a particular turbidity purely to ensure adequate disinfection downstream, a combined filter effluent critical limit alone is sufficient. However, where a plant needs to achieve a particular turbidity to demonstrate pathogen removal, an individual filter effluent critical limit is necessary. Calibration was examined in some detail at the plant and good records and examples of calibration practices were viewed. Calibration practices appeared to be broadly acceptable during the audit period but many opportunities for improvement were identified and discussed at audit. All of these opportunities for calibration is currently being upgraded to bring it more into line with the more excellent practices in place in the water treatment plants. Rather than comment on the observations made and opportunities arising during the audit, SW is commended for seeking to make further improvements in this area and should be moving to reach a standard closer to the drinking water plants in the near term. This change is encouraged because the water su			
2.3	Changes to management of water quality							
2.3	Sydney Water must notify NSW		NSW Health was notified and	Full	SW and NSW Health take part in JOG and SLG meetings quarterly. The			

Appendix	2 Water Quality Detailed Audit Findings (Pa	rt 2)			
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary
Audit if changed	<ul> <li>Health of any proposed changes to its processes for: <ul> <li>managing; or</li> <li>reporting to NSW Health in relation to;</li> </ul> </li> <li>Drinking Water quality under clause 2.1 or Recycled Water quality under clause 2.2 where such changes may have a material impact on public health.</li> <li>Sydney Water must obtain NSW Health's approval for any changes notified under clause 2.3(a) before implementing them.</li> </ul>		provided approval prior to the implementation of any changes to processes mentioned in the requirement.		minutes of these meetings were sighted and all four of each meetings took place during the audit period. A register of correspondence between NSW Health and SWC was provided for the audit period. This Dept of Health Correspondence Register July to June 2011 - June 2011 document demonstrates frequent communication with NSW Health, in addition to the JOG and SLG.

# **Appendix 3** Infrastructure Performance Detailed Audit Findings (Part 3)

Appendix 3	Infrastructure Performance Detailed Audit	Findings (Part 3)					
Clause And	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary		
Scope				Grade			
3.1.1	Managing Assets						
3.1.1							
NR							
3.1.2	Asset management framework						
3.1.2							
NK							
3.2	Notification of significant changes to asset management framework						
3.2 NR							
3.3	System performance standards						
3.3 Context	For the purposes of this clause 3.3 (except in relation to Uncontrolled Sewerage Overflows under clause 3.3.3), each separately billed or separately occupied part of multiple occupancy Property is considered to be a separate Property. For the purposes of Uncontrolled Sewerage Overflows under clause 3.3.3, each multiple occupancy Property is counted as a single Property. In the case of any ambiguity in the definition or application of any system performance standards, IPART's interpretation or assessment of the system performance standards will prevail.						
3.3.1	Water Pressure Standard						
3.3.1(a) Audit	Water Pressure Standard Sydney Water must ensure that no more than 6,000 Properties experience a	High Risk Preventing low pressure can	The standard that no more than 6,000 Properties experience a Water Pressure Failure in a financial year has	Full	Summary There were 832 properties affected by pressure issues in 2010/11verses licence standard of 6000, 107 of these were due to system capacity constraints and 725		

Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary
	Water Pressure Failure in a financial year in its Drinking Water supply system.	reduce: Public health hazard Customer property damage Disruption to industrial and commercial customers Health risk to customers dependant on a secure water supply Fire service capability	been met and actions have been undertaken to ensure on- going compliance.		were due to operational problems lasting longer than 4 days. Sydney Water's performance against this standard has been excellent for many years. The operational failure result was principally attributed to a problem experienced due to a vital valve failing in a closed position. Due to the complex nature of shutdowns, the limitations in accessing valves located in difficult to access locations (due to traffic and other community disruption) and the interconnection of water supply networks, a systematic approach is required to determine where such problems occur. The auditor considers such issues and the length of time taken to resolve them to be (a) technically defensible, (b) unavoidable given the circumstances. There was no record in the works order system of the valve being shut in the first place. A Suggestion for Improvement would be to remind operators of the need to record details of actions taken in the field that alter performance of the system. Sydney Water were queried with regard to their preventive maintenance strategies for valves and advised that their normal preventive maintenance practice involves prioritisation of all valves into critical – which are inspected/tested once every five years and non-critical – which are run-to-failure. Given the number of valves in the system – the strategy is considered appropriate, though a Suggestion for Improvement would be consideration of finer granularity and consideration of more frequent testing of higher criticality valves, as the valve concerned was considered to be 'critical' and had been shut for at least two years, though the impact had been masked by low consumptions.

Appendix 3	3 Infrastructure Performance Detailed Audit Findings (Part 3)						
Clause And	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit	Auditor Commentary		
Scope				Grade			
					during the restriction period of the last few years. The reduced consumption therefore led to minimal pressure issues and a considerable buffer is considered available in meeting this standard into the future.		
					Potential Opportunities for improvement:		
					• A suggested improvement would be to remind operators of the need to record details of actions taken in the field that alter performance of the system (for example to avoid the instance where there was no record in the works order system of a critical valve being shut).		
					• A suggested improvement is to consider finer granularity around asset criticality and more frequent testing of higher criticality valves (for example the valve in question had been closed for more than two years and the impact had been masked by low consumption, the current practice is for inspection of critical valves on a 5 yearly basis, this could potentially be increased for highly critical assets)		
3.3.1(b)	Water Pressure Failure						
Context	A Property is taken to have experienced a N	Nater Pressure Failu	ure at each of the following times:				
	(1) when a person notifies Sydney Water	r that the Property I	has experienced a Water Pressure I	ailure and the	at Water Pressure Failure is confirmed by Sydney Water; or		
	(2) when Sydney Water's systems identit	fy that the Property	has experienced a Water Pressure	Failure.			
	A Property will not be taken to have expe occurrence or from abnormal demand (suc	rienced a Water Pr h as demand during	ressure Failure only because of a s g fire fighting).	short term op	erational problem (such as a main break) which is remedied within 4 days of its		
	Clause 3.3.1(b)(1) does not limit the circum	istances in which a I	Property will have experienced a W	ater Pressure	Failure.		
3.3.2	Water Continuity Standard						
3.3.2(a) (1) Audit	Sydney Water must ensure that no more than 40,000 Properties experience an Unplanned Water Interruption exceeding 5 hours in a financial year; and	High Risk Preventing supply disruption can reduce: Public health bazard	The standard that no more than 40,000 Properties experience an Unplanned Water Interruption exceeding 5 hours in a financial year has been met and actions have been undertaken to ensure on-	Full	Result: 26,205 properties experienced unplanned water interruptions exceeding 5 hours and these were caused by 511 events. There were more failure events this year than last but no systemic reason that addressed the total increase was identified for the number of events that occurred or the increase in properties affected from last year. Though it is noted that the number of properties affected per event increased from approximately 60 to 65. It is also noted that the pressure management strategy		

Appendix 3	x 3 Infrastructure Performance Detailed Audit Findings (Part 3)								
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary				
		Damage to customer property Disruption to industrial and commercial customer operations Health risks to people dependant on a secure water supply. Damage to water dependant machinery and equipment.	going compliance.		should have reduced the number of failure events. It is acknowledged that there is a lot of 'noise' or movement in performance from year to year, but there is also a clear underlying negative trend. This is the first increase in two years and, while well within the standard, an increase in approximately 6000 properties affected (30%) in one year, and the underlying trend needs to be monitored. Discussions with Sydney Water identified that while the results were routinely monitored by a 'maintenance executive' group that meets regularly and monitors trends, there was no formal process or target for triggering an exception report for activating a maintenance review. A breakdown of failures by main size and properties affected was requested. <b>Evidence Provided</b> Performance Indicator Sheet - PI CIV002 BI Code for Water Continuity Business Objects example - reporting fields 1 2010-11 Op_lic ReportProperty_Compliance_W Last Doc shows 26,205 greater than 5 hours from 1/07/2010 to 30/06/2011, PI sheets shows correct interpretation of measures. <b>Audit Comments</b> Over the last year since the last audit, the number of properties experiencing an unplanned water interruption exceeding five hours has increased from around 20,000 to 26,000. There were concerns regarding this increase as there seemed to be no clear reason for the increase. The implication being that if similar increases occurred over the next two years that Sydney Water could potentially be non-compliant in this standard. Additional information was provided following that audit, to show a year on year comparison between the 2009/10 and 2010/11 years by diameter and a comparison of average properties per event over the last eight financial years. This analysis indicates that the number of properties per event has been fairly static across the eight years of information provided, with an average of around				

Appendix 3	x 3 Infrastructure Performance Detailed Audit Findings (Part 3)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary			
3.3.2(a) (2) Audit	Sydney Water must ensure that no more than 14,000 Properties experience 3 or more Unplanned Water Interruptions of more than 1 hour duration in a financial year, in its Drinking Water supply system.	High Risk: Risks are as for clause 3.3.2 (a)(1) above.	The standard that no more than 14,000 Properties experience 3 or more Unplanned Water Interruptions of more than 1 hour duration in a financial year has been met and actions have been undertaken to ensure on-going compliance.	Full	<ul> <li>60 properties per event. An overall downward trend was also indicated from 30,000 in 2006, with the 20010/11 year being the first with an upward trend over the intervening 4 year period.</li> <li>Sydney Water has reviewed the historical data but has not been able to draw any conclusions regarding the increase. What was evident was that the number of supply interruption events affecting 100mm pipes increased from 181 to 283 from 2009/10 to 2010/11.</li> <li>Sydney Water is undertaking root cause analysis on breaks and is keeping a watching brief on performance of this target. There is no set trigger point yet to investigate further programmes; however trends are being monitored on a monthly basis.</li> <li>As a Suggestion for Improvement: it is suggested such an exception reporting trigger be considered.</li> <li>Evidence Provided: <ul> <li>Performance Indicator Sheet – PI CIV022</li> <li>1 2010-11 Op_lic ReportProperty_Compliance_W</li> </ul> </li> <li>The Compliance report shows 5,305 properties with unplanned interruptions greater than 14,000 from 1/07/2010 to 30/06/2011: PI sheets shows correct interpretation of measures: Renewals Strategy has been provided as evidence although not the trigger levels.</li> <li>Audit Comments:</li> <li>Sydney Water is comfortably meeting this target, which is a new measure for this Operating Licence. Data has been collected for a number of years for performance at 5,305 properties experiencing 3 or more unplanned interruptions compared with the standard of no more than 14,000 is a good result.</li> <li>The usefulness of this Standard is linked not only to focusing on customers who receive the poorest performance, but that it is intended to be linked to the</li> </ul>			

Appendix 3	Infrastructure Performance Detailed Audi	t Findings (Part 3)					
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary		
					decision making framework for water main renewals (as a condition trigger) and is a global benchmark. Given the limited opportunity for preventive or other condition monitoring maintenance of underground pipelines, such a measure takes on added importance.		
					the number of breaks per lengths, criticality, etc. The team look at repeat asset failures and repeat unplanned interruptions as part of this process.		
					A maintenance strategy has triggers in place to elevate repeat events to be resolved via a capital renewals process which has been benchmarked against worldwide practices.		
					The main trigger for renewal in the current decision framework is economically driven with a 7.5% return on investment on any 250 metre renewal/replacement being the trigger. Integration of customer disruption to this logic framework is supported.		
3.3.2(b) Context	Unplanned Water Interruption In determining whether a Property experiences an Unplanned Water Interruption a best estimate is to be applied from the best available data, taking account of water pressure data where that data is available. A Property is taken to have experienced a separate Unplanned Water Interruption for each period of 5 hours or more that the Unplanned Water Interruption exists. Clause 3.3.2(b)(2) does not limit the circumstances in which a Property will have experienced an Unplanned Water Interruption under clause 3.3.2(b)(1).				Action: IPART to look at changing the reporting manual to address the wording in 3.3.2(b)		
Appendix 3	3 Infrastructure Performance Detailed Audit Findings (Part 3)						
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Clause	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit	Auditor Commentary		
Scope				Grade			
3.3.3	Sewage Overflow Standard						
3.3.3(a) Audit	Sydney Water must ensure that no more than 14,000 Properties (other than Public Properties) experience an Uncontrolled Sewage Overflow in dry weather in a financial year.	High Risk: Preventing discharge of raw sewage onto customer property can reduce: Public health hazard Damage customer property Unnecessary cleanup costs Claims for damage.	The standard that no more than 14,000 Properties (other than Public Properties) experience an Uncontrolled Sewage Overflow in dry weather in a financial year has been met and actions have been undertaken to ensure on- going compliance.	Full	<ul> <li>Evidence Provided: <ul> <li>(a) Maximo BI report "Civ-Compliance-Property Compliance Sewage V1.0" (page 1)</li> <li>(b) Sewer Overflow Maximo BI report specifications</li> <li>(c) Folio of Progress "Sewage Overflow Standard"</li> <li>(d) Dry Weather Overflow Management Decision Framework (Doc ID AMQ0139)</li> <li>(e) Sewer Main Asset Mgt Plan (Doc ID: AMQ0032) Pages 1, 31,32, 55,102-104</li> <li>(f) Work instruction "Pipe Selection Database for the Dry Weather Overflow Reduction Program"</li> <li>(g) Wastewater Systems Maintenance Prioritisation and Maximo Application (Doc Id WWN00036)</li> <li>(h) Sewerage Network Choke Management Strategy (SKM 2005) – Reviewed and updated in Asset Management Plan</li> <li>(i) Various business reports which can be made available upon request: - <ul> <li>(1) 6 monthly – Ministers Report,</li> <li>(2) Quarterly- 0&amp;M,</li> <li>(3) Monthly - Mtce Business, WW Networks, Mtce Eng Civil &amp; Pipes)</li> </ul> </li> </ul></li></ul>		
					Audit Comments: This standard is also modified for 2010/11. It now recognises that the customer impact/consequence of sewage system overflows are more closely linked to the physical property count/land parcels than the total number of customers. The target Standard has been lowered from 25,000 to 14,000 to reflect the lower total of physical properties. Compliance with this clause has been fairly static over the last few years with uncontrolled dry weather overflows hovering around the 9,000 mark. This year the result was 9,158 which is comfortably within the 14,000 target.		

Appendix 3	3 Infrastructure Performance Detailed Audit Findings (Part 3)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary			
					Results for this standard were compiled from the Business Intelligence system. Data is collected within the FRM (Field Resource Management) system and has two components, information collated from the customer complaints and the works order database. Both pieces of information go through to maximo and hydra separately and are then linked by work order number. Properties are identified and rebates are issued through the billing system. The Dry Weather strategy was implemented in 2007 and is an ongoing strategy. Continued decreases in dry weather overflows have been seen since the introduction of this programme. A significant improvement in proactive maintenance technology has been introduced with sewerage pipeline jetting machines now being fitted with flexible heads that allow cleaning of connections as well as the principal Sydney Water pipeline that the machine is located in. Since many of the sources of Sydney Water pipeline blockages are in the customer connection, this will result in a significant improvement in performance. Over the last 18 months Sydney Water has issued notices to private properties to advise of root problems. Around 30% of overflows are attributed to			
					This programme is believed to be partly responsible for the maintenance of the target. Problem areas are identified in the ongoing CCTV programme in addition to analysis of repeat choke events.			
3.3.3(b) Audit	Sydney Water must ensure that no more than 175 Properties (other than Public Properties) experience 3 or more Uncontrolled Sewage Overflows in dry weather in a financial year.	High Risk: Risks are as for clause 3.3.3 (b) above.	The standard that no more than 175 Properties (other than Public Properties) experience 3 or more Uncontrolled Sewage Overflows in dry weather in a financial year has been met and actions have been undertaken to ensure on-going compliance.	Full	<ul> <li>Evidence Provided:</li> <li>a. Maximo BI report "Civ-Compliance-Property Compliance Sewage V1.0" (page 1)</li> <li>b. Sewer Overflow Maximo BI report specifications</li> <li>c. Folio of Progress "Sewage Overflow Standard"</li> <li>d. Dry Weather Overflow Management Decision Framework (Doc ID AMQ0139)</li> <li>e. Sewer Main Asset Mgt Plan (Doc ID: AMQ0032) Pages 1, 31,32, 55,102-104</li> </ul>			

Appendix 3	Infrastructure Performance Detailed Audi	t Findings (Part 3)			
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary
					<ul> <li>f. Work instruction "Pipe Selection Database for the Dry Weather Overflow Reduction Program"</li> <li>g. Wastewater Systems Maintenance Prioritisation and Maximo Application (Doc Id WWN00036)</li> <li>h. Sewerage Network Choke Management Strategy (SKM 2005) – Reviewed and updated in Asset Management Plan</li> <li>i. Various business reports which can be made available upon request: -</li> <li>6 monthly – Ministers Report,</li> <li>Quarterly- O&amp;M,</li> <li>Monthly - Mtce Business, WW Networks, Mtce Eng Civil &amp; Pipes)</li> <li>Property Compliance Sewage v1.0 2010_11 – shows report showing 3 private properties experiencing &gt; 3 DWO or WWO 01/07/2010 – 01/07/2011</li> <li>Renewals strategy – 3 repeat events in 2 years is a standard trigger point, based upon financial strategy but also relates to customer impacts.</li> </ul>
3.4	Service quality and system performance indicators				Audit Comments: This is a new target and takes into account the costs of meeting standards and future growth. The target is 175 and for this first year the number of repeat events per property (>3) was 30. Information has been validated between BI and WAMS and Maximo, checked results were the same between both sets of queries. Technical actions being taken to meet this target are referenced in 3.3.3(a)
3.4 (a) Audit	Sydney Water must maintain record systems that are sufficient to enable it to measure accurately its performance against the Service Quality and System Performance Indicators.	High Risk. Robust record systems are necessary to ensure that	The record systems are sufficient to enable the accurate measurement of performance against the Service Quality and System	Full	Evidence Provided:(a) Data Validations – Roles & Responsibilities 2010 2011(b) FRM Work Flow(c) How to resolve – Guidelines for correcting data errors

Appendix 3	Infrastructure Performance Detailed Audit Findings (Part 3)						
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary		
		compliance is achieved	Performance Indicators.		<ul> <li>(d) Identifying Properties in FRM Maps</li> <li>(e) Hydra Connectivity Rules</li> <li>Audit Comments: <ul> <li>A review of the data collection methodologies indicated data for all measures is being collated correctly through a combination of data drawn from: <ul> <li>The Customer Service/Complaints System</li> <li>The work order System</li> <li>The GIS and Asset Management Databases.</li> <li>The ICATS Telemetry System</li> </ul> </li> <li>The aggregated data is held in a centralised data warehouse that ensures data retention.</li> <li>A significant improvement in data quality and reliability can be anticipated with the introduction of 'Toughbook' portable computers for field staff. This system allows: <ul> <li>Direct recording of work order data</li> <li>Error checking</li> </ul> </li> <li>The ability to record data corrections for key asset management and GIS data. Improvements in delivery against service standards can be anticipated with up to date GIS and asset data also available to the field crews on site.</li> <li>For both sewerage system and water interruption data, system connectivity is now being utilised for recording customer interruptions. This system replaces the office based drawing of polygons on the GIS system to establish property counts. It is inherently more reliable, as long as the connectivity data held in the databases is correct.</li> </ul></li></ul>		
3.4 (b) Context	In the case of any ambiguity in the definition or application of any indicators, IPART's interpretation or assessment of the indicators will prevail.						

Appendix 3	Infrastructure Performance Detailed Audit Findings (Part 3)						
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary		
3.5	Response time for water main breaks						
3.5 (a) Audit	Sydney Water's response to water main breaks and leaks (in the trunk and reticulation components of Sydney Water's Drinking Water supply system between water treatment plants and a Property), as measured from the time Sydney Water receives notification of a break or leak to the time Sydney Water stops the loss of water, will be as follows: Priority 6 breaks/leaks 90% of jobs within 3 hours Priority 5 breaks/leaks 90% of jobs within 6 hours Priority 4 breaks/leaks 90% of jobs within 5 days	Moderate Risk. Reducing delays in response to breaks and leaks can reduce: Disruptions to supplies and insufficient supplies Loss of water Customer satisfaction Public perception	The obligation has been met and actions have been undertaken to ensure on-going achievement of the targets. Data to support the calculations are complete, accurate and reliable.	Full	<ul> <li>Audit Comments:</li> <li>This Licence Clause has been modified. The previous Licence incorporated two levels of performance target for each priority level. This has been reduced to a single performance target for each Priority.</li> <li>Performance for 2010/11 for each of the Priorities was above the required target, though down on 2009/10 performance. The auditor considers performance adequate and does not consider the variance over last year to warrant further comment.</li> <li>During discussions it was identified that the external Dial Before You Dig process can cause noticeable delays for Priority 4 work orders with up to 4-5 day delays in receipt of information. It is also noted that Sydney Water is denied access to the Dial Before You Dig GIS database. The auditor sees no reason why appropriately security cleared Sydney Water staff could not be given database access.</li> <li>Suggestion for Improvement: Management of this issue is beyond Sydney Water's control but this is noted for future auditor reference in terms of performance and for recommendation that the opportunity for improvement should be brought to the attention of the relevant Minister/Department.</li> </ul>		
3.5 (b) Context	Categorisation of Priorities 4, 5 and 6 is set out in Schedule 3.						
3.6	Priority Sewage Program			Full			
3.6 (a) Audit	Sydney Water must continue with the planning and delivery of the Priority Sewerage Program such that Wastewater services are provided to the requisite number of lots in the following areas by the dates specified below: Agnes Banks and Londonderry by 31	Moderate Risk. Priority sewerage is important to prevent: Public health hazard	The status and degree of completion of the planning and delivery of the Priority Sewerage Program are consistent with program completion by the due date.	Full	Evidence Provided: PSP June 2011 Priority Sewerage Program Team – Monthly Report June 2011 Audit Comments: A report was presented to the audit team indicating overall progress, all of the priority sewage programmes were around 70-80% complete. The Report is		

Appendix 3	Infrastructure Performance Detailed Audi	t Findings (Part 3)			
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary
	December 2012; Glossodia, Freeman's Reach and Wilberforce by 31 December 2012; Yellow Rock and Hawkesbury Heights by 31 December 2012; and Appin by 30 June 2015.	Damage customer property unnecessary cleanup costs			<ul> <li>issued to the Alliance team members and to Sydney Water.</li> <li>Construction is complete for some of the areas, and the team are now waiting for customers to actually connect.</li> <li>In Agnes Bank, Glossodia and Yellow Rock– construction is complete and connections are now available to all lots. Licence compliance has been achieved ahead of time and Sydney Water is now waiting for customers to connect.</li> <li>The targeted completion for Appin is by Mid-June next year well in advance of the 2015 requirement. This is currently 12% complete.</li> </ul>
3.6 (b) Audit	If either Sydney Water or a licensee under the Water Industry Competition Act 2006 provides Wastewater services to a significant development (as determined by the Minister) in an adjoining area to one of the following areas in the Priority Sewerage Program: • Austral and West Hoxton; • Wilton; or • Menangle and Menangle Park, then Sydney Water must deliver the Priority Sewerage Program in that area such that Wastewater services are made available to Customers within 24 months of Wastewater services being available to service the significant development.	Moderate Risk. Risks are as for clause 3.6 (a) above.	The status and degree of completion of the planning and delivery of the Priority Sewerage Program are consistent with program completion by the due date.	Full	<ul> <li>Audit Comments:</li> <li>Maps have been provided for all villages with adjacent growth. Some have been "released" but have not been zoned. These areas are about to be rezoned and therefore currently there is no driver to deliver PSP in these areas.</li> <li>A summary of progress for each site is as follows: <ol> <li>Austral has not been triggered. West Hoxton – Middleton Grange is adjacent and has 2,400 potential lots with 45% of these complete, and planning is now underway in anticipation of the clause being triggered.</li> <li>Wilton Park Release Area – the potential lots are 1,200, 5% are completed. This adjoins the PSP 300 lots. This has not been considered a significant enough development to trigger this clause. Sydney Water is working on expanding the PSP programme due to the new government's direction. One preferred strategy is to combine SWC and Bingara Gorge WICA.</li> <li>Menangle and Menangle park, potential 3,000 dwellings, 0% completion. Therefore not triggered.</li> </ol> </li> <li>The clause has not been triggered as there has not yet been a determination by the Minister. With West Hoxton, Sydney water has commenced planning with the expectation that this will be triggered in the future.</li> <li>This clause may be varied in the next operating licence.</li> </ul>
3.6 (c) Context	Clause 3.6(b) does not apply where a licensee under the Water Industry Competition Act 2006 provides				

Appendix 3	Infrastructure Performance Detailed Audit Findings (Part 3)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary			
	Wastewater services to the relevant area of the Priority Sewerage Program.							
3.6 (d) Audit	Sydney Water must complete planning for, and begin construction on, the provision of Wastewater services to the requisite number of lots in the Cowan and Bargo areas of the Priority Sewerage Program by the end of the term of the Licence. The construction work to be commenced by the end of the term of the Licence must include the augmentation of the sewage treatment plant at Picton required to facilitate the implementation of the Priority Sewerage Program in the Bargo area.	Moderate Risk. Risks are as for clause 3.6 (a) above.	The status and degree of completion of the planning and delivery of the Priority Sewerage Program are consistent with program completion by the due date.	Full	Audit Comments: A draft servicing strategy has been prepared and the options analysis has been completed and has been approved A number of peer reviews have been undertaken both internally and externally. The new licence will bring forward completion of these works to the end of 2014.			
3.6 (e) Audit	Should delays caused by consent authorities impair Sydney Water's ability to meet the timeframes set out in this clause 3.6, Sydney Water must write to the Minister to advise of the reasons for the delay.	Low Risk Administrative requirement.	Sydney Water has written to the Minister to advise about delays caused by consent authorities that would impair its ability to meet the timeframes set out in this clause 3.6.	Full	Audit Comments: N/A No issues with consent authorities. Sydney Water does not feel it has been impeded.			
3.6 (f) Audit	Sydney Water must provide an annual report on its progress in implementing the Priority Sewerage Program to IPART in accordance with the Reporting Manual.	Moderate Risk This is reported to IPART who check reports	An annual report on progress in implementing the Priority Sewerage Program has been provided to IPART as required.	Full	Audit Comments: Record of transmittal has been provided in the evidence package.			
Min. Require- ment	Validation of water infrastructure design methodology Sydney Water to present a report to	Moderate Risk This is reported to IPART who	This Ministerial Requirement has been fully addressed.	Full	Audit Comments: Has been fully addressed previously and the auditor was fully engaged in the process and confirms compliance.			

Appendix 3	Infrastructure Performance Detailed Audi	t Findings (Part 3)			
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary
MR1	IPART before 31 March 2011 which outlines information and assumptions that demonstrate the validation of water infrastructure design methodology and assumptions for a range of water supply zones. The information provided should be sufficient to enable a determination of the suitability of Sydney Water's approach.	check reports			
Min. Require- ment MR2	Critical Water Mains – measures for monitoring and managing failures As part of the 1 September 2011 compliance report for the Operating Licence, it would provide further assurance to the community that the water system is being managed in an efficient and effective manner and action is being taken to reduce impacts on customers if Sydney Water could note the measures it is taking to monitor, minimise and manage failures to critical water mains.		This Ministerial Requirement has been fully addressed.	Full	<ul> <li>Audit Comments:</li> <li>Copy of the ministerial report was provided.</li> <li>Sydney Water gave an overview of its critical mains analysis process. The processes being undertaken are considered to be of a high standard.</li> <li>It is a multi-criteria risk based approach for identifying critical assets prioritised by high consequence of failure. 4,700km out of 21,000km have been classified as 'critical'. Classification of 'critical' dictates maintenance strategy decision of adopting pro-active management and predictive research vs run-to-fail.</li> <li>Condition monitoring for water mains is more limited than for sewerage due to the relatively limited opportunity to utilise cameras. Processes for assessing condition as the base input to the development of deterioration curves (and hence determination of renewal/replacement date) include:</li> <li>(a) Desktop analysis of basic asset attributes including material, age.</li> <li>(b) Monitoring of breaks and leaks</li> <li>(c) Condition assessment. Currently investigating use of new technology of Linear Polarisation Resistivity (LPR) vs older and more expensive technique of magnetic reflux (undertaken if LPR results flag the need for further investigation).</li> <li>An LPR review has been undertaken - 300km of LPR results have been compared with failure records by an external party, this provided some</li> </ul>

Appendix 3	Infrastructure Performance Detailed Audi	it Findings (Part 3)			
Clause	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11	Auditor Commentary
And				Audit	
Scope				Grade	
					confidence in the LPR process although due to the small number of failures the data set was fairly small. LPR is an inferred condition technique and testing to relate to actual condition and deterioration is on-going
					Discussion about cathodic protection (CP) identified there is limited use of this process due to the nature of the assets involved. CP is principally only applied at railway crossings due to the predominance of iron mains rather than mild steel.
					It was identified, however, that no consideration has yet been taken of what the deterioration curves of mains with CP might look like if the CP failed. Given CP is actually applied at one of the most critical water main/other asset interface points - this is considered to be a gap in the analysis.
					<b>Suggestion for improvement</b> is that Sydney Water should address the use and effectiveness of its CP program in its deterioration and condition rating curve development analysis.

# Appendix 4 Customer and Consumer Rights Detailed Audit Findings (Part4)

Appendix 4	Appendix 4 - Customer and Consumer Rights Detailed Audit Findings (Part4)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor comments at the audit meeting			
4.1	Customer Contract							
4.1 (a) Context	Section 54 of the Act requires that the terms and conditions of a customer contract are set out in Sydney Water's operating licence. Sydney Water's customer contract is set out in Schedule 2 (Customer Contract).		Clauses (a) and (b) are interpretive clauses only.		<ul> <li>Evidence Provided:</li> <li>Audit Comments: <ul> <li>(a) Customer Contract in Brief – pamphlet sent to customers last week</li> <li>(b) Have a translation service in the service centre and can get copies of the customer contract translated over the phone.</li> </ul> </li> <li>(c) SW could improve access by putting the customer contract into "Quick Links".</li> </ul>			
4.1 (b) Context	The Customer Contract sets out the rights and obligations of Customers and Sydney Water in relation to the Services provided through systems required under the Licence. These rights and obligations are in addition to the rights and obligations conferred by the Act and any other law.		Clauses (a) and (b) are interpretive clauses only.					
4.1 (c) Audit	A copy of the Customer Contract, and any variations to it must be posted on Sydney Water's website for downloading by any person free of charge and provided to Customers free of charge upon request.	Moderate Risk The contract is made robust by customer understanding of its contents.	A copy of the Customer Contract, and any variations to it, have been posted on Sydney Water's website for downloading free of charge and provided to Customers free of charge upon request.	Full	Evidence Provided: The auditor was directed to the SWC website http://www.sydneywater.com.au/WhoWeAre/OperatingLicence/Custo merContract.cfm A copy of the full contract was found in the Operating Licence and on SW website at Who we are → Operating Licence → Customer Contract. The Customer Contract can also be sent out by CSRs in the Contact			

Appendix 4	Appendix 4 - Customer and Consumer Rights Detailed Audit Findings (Part4)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor comments at the audit meeting			
Scope 4.2.1 4.2.1 Audit	<ul> <li>Explaining the Customer Contract</li> <li>Sydney Water must prepare a pamphlet that: <ul> <li>(a) provides a brief explanation of the Customer Contract;</li> <li>(b) summarises the key rights and obligations of Customers under the Customer Contract;</li> <li>(c) refers to the types of account relief available for Customers experiencing financial hardship; and</li> <li>(d) contains a list of Sydney Water's contact numbers in its Area of Operations.</li> </ul> </li> </ul>	Moderate Risk The contract is made robust by customer understanding of its contents.	A pamphlet has been prepared that meets all of the requirements in the obligation	Full	Centre. Audit Comments: (a) Customer Contract in Brief – pamphlet sent to customers last week (b) Sydney Water has a translation service in the Service Centre and can get copies of the customer contract translated over the phone. While the translation service is made available, Sydney Water note the difficulty that can arise in initial determination of the required language. (c) Opened link – pdf freely accessible on the Sydney Water Website "Our Contract with you". During a web search on the website it came up fourth. This could be addressed. Could put into "Quick Links". Evidence Provided: A copy of the Customer Contract (summary) pamphlet was sent out with August-September 2010 (spring) bill and is appended to page 21. The Customer Contract summary was sent out with August-September 2010 (spring) bill. The pamphlet (a) provides explanation of Customer Contract (page 2) (b) summarises rights and obligations of Customers (page 3-9) (c) refers to hardship relief (page 9); and contains contact numbers (page 10-12). Audit Comments: Pamphlet viewed – a) and b) covered			
					<ul> <li>c) – Account relief – this is not listed, but says to contact Sydney Water.</li> <li>IPART suggestion to put in some bullet points to highlight the options and overall message, ie call SWC if you need assistance, but</li> </ul>			

Appendix 4	Appendix 4 - Customer and Consumer Rights Detailed Audit Findings (Part4)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor comments at the audit meeting			
4.2.2	Explaining variation to Customer Contract				<ul> <li>also provide a summary list of the main ways issues could be resolved e.g. instalments, etc</li> <li>d) - Contact numbers shown in three different areas, nice touch to have the ombudsmen contacts</li> <li>The pamphlet is reprinted annually.</li> </ul>			
4.2.2 Audit	<ul> <li>The pamphlet prepared under clause</li> <li>4.2.1 must be updated when changes are made to the Customer Contract and must be disseminated by Sydney Water free of charge to:</li> <li>(a) Customers, at least once annually with their quarterly or other bills; and</li> <li>(b) Any other person on request.</li> </ul>	Moderate Risk The contract is made robust by customer understanding of its contents.	The pamphlet has been updated as required and was disseminated free of charge as set out in the obligation.	Full	<ul> <li>Evidence Provided:</li> <li>The pamphlet was updated in May 2011 in accordance with the new Customer Contract and sent out in accordance with the 'Water wrap, Business update and Your water production' procedure.</li> <li>Audit Comments:</li> <li>Yes, a) produced over 1.7 million of these pamphlets out with bills (saw the purchase order).</li> <li>b) Additional copies are kept at the Contact Centre and staff send customers a copy or send via email depending upon their preference. Customers are also referred to the Sydney Water web site.</li> </ul>			
4.3	Consumers							
4.3 Audit	Sydney Water's obligations under the Customer Contract relating to complaint handling and complaint resolution procedures are extended to Consumers as if the Consumers were a party to the relevant Customer Contract.	Moderate Risk The contract is made robust by customer understanding of its contents.	Obligations under the Customer Contract relating to complaint handling and complaint resolution procedures have been extended to all consumers	Full	Evidence Provided: A copy of Sydney Water's Customer complaints Policy & Procedures attached. A copy of the Policy is available on the following website under 'Support customer relations' <u>http://www.sydneywater.com.au/Publications/Policies.cfm</u> Consumers include all users of Sydney Water and not only those that receive a bill. Chapter 4 (page 20) describes Customer and Consumer Rights and Chapter 5 of the Contract (page 25) covers Complaint and Dispute Handling. See Clause 2.2 (Page 60). Audit Comments: The Policy was viewed on the SW website. Section 1.2 Scape indicates			

Appendix 4	Appendix 4 - Customer and Consumer Rights Detailed Audit Findings (Part4)						
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor comments at the audit meeting		
4.4	Practices and procedures relating to customer hardship, debt, water flow restriction and disconnection for non				that the policy applies to all complaints from customers or other members of the community received by Sydney Water. Sydney Water does not differentiate between customers and consumers except with the positive step of not restricting the tenant of a property if the landlord fails to pay the landlord's component of a bill.		
4.4 (a) Audit	<ul> <li>Sydney Water must have in place and comply with procedures relating to customer hardship, debt, water flow restriction and disconnection. These procedures must include:</li> <li>(1) a customer hardship policy for residential Customers, that helps residential Customers in financial difficulty better manage their current and future bills;</li> <li>(2) a payment plan for residential Customers who are responsible for paying their bill and who are, in Sydney Water's opinion, experiencing financial difficulty;</li> <li>(3) conditions for disconnection of supply or water flow restriction in accordance with the disconnection procedure set out in the Customer Contract; and</li> <li>(4) provisions for self-identification,</li> </ul>	Moderate Risk Basic consumer protection for cases of financial hardship and requires a statement of Sydney Water's debt management policies.	The procedures set out in the obligation relating to customer hardship, debt, water flow restriction and disconnection are in place.	Full	Evidence Provided:         The Auditor will be directed to the website         http://www.sydneywater.com.au/CustomerServices/CommunityAssista         nce/FinancialAssistance/         The auditor will be directed to the Overdue Payment and Disconnection         Policy on Sydney Water's website         http://www.sydneywater.com.au/Publications/Policies/OverduePayme         ntsDisconnections.pdf         The Auditor will be directed to the website         http://www.sydneywater.com.au/CustomerServices/CommunityAssista         nce/FinancialAssistance/         Comments:         Viewed financial assistance web page re working with community         agencies, which are then listed         Seen overdue payment and disconnections process         Audit Comments:         Sydney Water's policies and procedures are in conformance with the         Licence Clause requirements.		

Appendix 4	Appendix 4 - Customer and Consumer Rights Detailed Audit Findings (Part4)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor comments at the audit meeting			
	identification by community welfare organisations and identification by Sydney Water of residential Customers experiencing financial difficulty.				<ul> <li>Evidence was provided of a proactive and positive attitude and practices in the organisation to addressing not only immediate issues but in working towards assisting customers in resolving underlying issues. i.e. a proactive approach to eliminating or minimising repeat issues.</li> <li>1. A Hardship policy is provided – this identifies who is in hardship, once this is agreed customers are exempt from any kind of restrictions and a repayment programme is agreed to.</li> <li>2. Payment support mechanisms – some of these are government provided, there is a payment assistance scheme with a voucher based system administered by welfare agencies. Sydney water has payment extensions, plans, Centrepay from centrelink payments, counselling, no interest loans, etc.</li> <li>3) Overdue payments and disconnections – there is a policy in place for those who are struggling to pay or do not respond to SW efforts to contact them. The process is clearly outlined, with timings noted. It is noted in customer contract that Sydney Water have to make an attempt to contact the customer first. As a final measure notices are hand delivered 48 hours before taking any action.</li> <li>4) 2.2 in the payment assistance policy talks about identifying hardship. The Contact centre has a training manual in place, contact centre staff can offer advice on the process and deal with this on a daily basis. Sighted the contact centre manual under debt management.</li> </ul>			
4.4 (b) Audit	Sydney Water must set out the procedures relating to customer hardship, debt, water flow restriction and disconnection referred to in clause 4.4(a) in the Customer Contract.	Moderate Risk Requirement for Sydney Water to implement hardship provisions.	Procedures relating to customer hardship, debt, water flow restriction and disconnection are set out in the Customer Contract.	Full	Evidence Provided: The Auditor will be directed to the website http://www.sydneywater.com.au/CustomerServices/CommunityAs sistance/FinancialAssistance/ Audit Comments: These are documented in Section 6 of the Customer Contract.			
4.4 (c)	Sydney Water must provide	Moderate Risk	Information on procedures	Full	Evidence:			

Appendix 4	Appendix 4 - Customer and Consumer Rights Detailed Audit Findings (Part4)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor comments at the audit meeting			
Audit	<ul> <li>information on its procedures relating to customer hardship, debt, water flow restriction and disconnection free of charge to:</li> <li>(1) residential Customers, at least once annually with their quarterly or other bills;</li> <li>(2) residential Customers who are identified as experiencing financial difficulty; and</li> <li>(3) any other person who requests it.</li> </ul>	The publication of hardship provisions and debt management policies.	relating to customer hardship, debt, water flow restriction and disconnection free of charge have been provided to the groups mentioned in the obligation.		The Auditor will be directed to the website http://www.sydneywater.com.au/CustomerServices/CommunityAssista nce/FinancialAssistance/ A pamphlet was sent out in accordance with the 'Water wrap, Business update and Your water production' procedure with the Spring 2010 customer account. Audit Comments: This information is provided in Page 10 of the publicly available customer contract. Water Wrap and Customer Contract pamphlets together cover hardship, debt, water flow restriction and disconnection. On the bill there is also reference to assistance with payment and a number is provided.			
4.4 (d) Audit	Sydney Water must publish its procedures relating to customer hardship, debt, water flow restriction and disconnection on its website.	Moderate Risk The publication of hardship provisions and debt management policies.	Procedures relating to customer hardship, debt, water flow restriction and disconnection have been published on the website.	Full	Evidence Provided: Payment Assistance Policy attached and available on the following website http://www.sydneywater.com.au/CustomerServices/CommunityAssista nce/FinancialAssistance/ Information relating to flow restriction and disconnection can be found on the Sydney Water website at http://www.sydneywater.com.au/Publications/Policies/OverduePayme ntsDisconnections.pdf Audit Comments: Information was confirmed on the website.			
4.4 (e) Audit	Sydney Water must advise residential Customers of their rights, including any rights to have a complaint or dispute referred to the Energy and Water Ombudsman NSW for resolution.	Moderate Risk Information to customers about their rights of redress.	Residential customers have been advised of their rights, including any rights to have a complaint or dispute referred to the Energy and Water	Full	Evidence Provided: Evidence is contained in the Customer Contract, and pamphlet, which will be supplied at the audit. This information was also outlined in a pamphlet and WaterWrap,			

Appendix 4	Appendix 4 - Customer and Consumer Rights Detailed Audit Findings (Part4)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor comments at the audit meeting			
4.5.1	Customer Councils		Ombudsman NSW for resolution.		which was sent to residential customers in the summer 2010 bill. Audit Comments: This clause is addressed in 0Page 11 of pamphlet distributed to customers in response to 4.2.1			
4.5.1 (a) Audit	In accordance with the Act, Sydney Water must have in place and regularly consult with a Customer Council to enable community involvement in issues relevant to the performance of Sydney Water's obligations under the Licence. Sydney Water may have one or more Customer Councils.	Low Risk Consultation with the community about service levels.	At least one Customer Council is in place. The Customer Council is effectively consulted to enable meaningful community involvement in issues relevant to the performance of Sydney Water's obligations under the Licence.	Full	Evidence Provided: Copy of agenda, minutes and actions from Corporate Customer Council meetings held in September and December 2010 and March and June 2011. The auditor was referred to Sydney Water's website http://www.sydneywater.com.au/CustomerServices/CustomerCouncils/ The auditor's inquiries to members of the Corporate Customer Council resulted in Sydney Water receiving very positive feedback on this Clause			
4.5.1 (b) Audit	<ul> <li>Sydney Water must consult with the Customer Council, in accordance with the terms of the relevant Customer Council Charter, on:</li> <li>(1) the interests of Customers and Consumers of Sydney Water;</li> <li>(2) the Customer Contract; and</li> <li>(3) such other key issues related to Sydney Water's planning and operations as Sydney Water may determine.</li> </ul>	Moderate Risk Consultation with the community about service levels.	The Customer Council has been consulted, in accordance with the terms of the relevant Customer Council Charter, on all of the issues set out in the obligation.	Full	<ul> <li>Evidence Provided:         <ul> <li>Copy of agenda, minutes and actions from Corporate Customer Council meetings held in September and December 2010 and March and June 2011.</li> <li>Copy of 2010 Corporate Customer Council Annual Report.</li> <li>Copy of member suggestions and 2010-11 Forward Plan.</li> </ul> </li> <li>Audit Comments:         <ul> <li>The meeting Charter was updated in September 2010 and the forward plan incorporates suggestions put forward by the Customer Council.</li> <li>Evidence was viewed of collated consultation with members and the executive for inclusion in the forward plan.</li> </ul> </li> </ul>			
4.5.1 (c)	Sydney Water must appoint the	Low Risk	Members of a Customer	Full	Evidence Provided:			

Appendix 4	Appendix 4 - Customer and Consumer Rights Detailed Audit Findings (Part4)						
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor comments at the audit meeting		
Audit	members of a Customer Council, consistent with the Licence	Establishment of Customer Council.	Council have been appointed consistent with the Licence		Copies of agendas (including attendees) for meetings held in September and December 2010 and March and June 2011. List of 2011 Corporate Customer Council members. Audit Comments: List of Customer Council members was viewed.		
4.5.1 (d) Audit	<ul> <li>At all times, the membership of a Customer Council must include a representative for the interests of at least each of the following:</li> <li>business and consumer groups;</li> <li>low income households;</li> <li>people living in rural and urban fringe areas;</li> <li>residential consumers;</li> <li>environmental groups;</li> <li>local government; and</li> <li>people from culturally and linguistically diverse backgrounds.</li> </ul>	Moderate Risk Establishment of Customer Council.	The membership of a Customer Council includes representatives as set out in the obligation.	Full	Evidence Provided: List of 2011 Corporate Customer Council members. Audit Comments: The Customer Council membership accurately reflects Sydney Water's customer base. There may be a gap under item (3) for rural and urban fringe areas although PIAC is a general consumer body. Sydney Water also consults in addition to this forum.		
4.5.1 (e) Audit	Sydney Water must provide a Customer Council with information within its possession or under its control (other than information or documents over which Sydney Water or another person claims confidentiality or privilege) necessary to enable that Customer Council to discharge the tasks assigned to it.	Moderate Risk Provision of meaningful information to the Customer Council.	A Customer Council has been provided with information necessary to enable that Customer Council to discharge the tasks assigned to it.	Full	Evidence Provided: Copies of papers sent to Council members ahead of meetings. Copy of an email to the Customer Council – provided to the audit team. Comments: For each meeting, 1-2 weeks prior to meetings members are provided with information. Other information is also provided out of session if there is anything significant to make the members aware of. The auditor's inquiries to members of the Corporate Customer Council		

Appendix 4	pendix 4 - Customer and Consumer Rights Detailed Audit Findings (Part4)						
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor comments at the audit meeting		
					resulted in Sydney Water receiving very positive feedback on this Clause		
4.5.2	Customer Council Charter						
4.5.2 (a) Audit	<ul> <li>In consultation with members of each Customer Council, Sydney Water must maintain a customer council charter (Customer Council Charter) that addresses:</li> <li>(1) the role of the Customer Council;</li> <li>(2) selection criteria on how members will be drawn from the community;</li> <li>(3) how the Customer Council will operate;</li> <li>(4) induction processes for new members;</li> <li>(5) a description of the type of matters that will be referred to the Customer Council;</li> <li>(6) 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;</li> <li>(7) communicating the outcome of the Customer Council's work to the public, including the publication of meeting agenda and minutes on Sydney Water's</li> </ul>	Moderate Risk Operation of Customer Council.	A customer council charter has been maintained that addresses the matters set out in the obligation.	Full	<ul> <li>Evidence Provided:         <ul> <li>Copy of Sydney Water Corporate Customer Council Charter, last updated in September 2010.</li> <li>Copy of meeting minutes from September 2010 in which the Council agreed on the Forward Plan.</li> <li>Copy of the Corporate Customer Council page on Sydney Water's website.</li> <li>Copy of actions arising from meetings held in September and December 2010 and March and June 2011.</li> <li>Copies of payment memo for meetings held in September and December 2010 and March and June 2011.</li> <li>Metter's website.</li> </ul> </li> <li>Copies of payment memo for meetings held in September and December 2010 and March and June 2011.</li> <li>http://www.sydneywater.com.au/CustomerServices/CustomerCouncils/ #3</li> <li>Audit Comments:</li> <ul> <li>Customer charter received.</li> <li>Funding and resources - Each member receives a payment of \$104 per meeting. An example of a payment memo was provided to the audit team. PIAC and CSSNSW invoice Sydney Water directly.</li> <li>Memos regarding attendances and payments for each Customer Council meeting were sighted during the audits.</li> <li>The agenda was shown on the website along with minutes from the previous meeting.</li> <li>There is a dedicated email address for the Customer Council. Note to Sydney Water to change the wording in the "To Know More" section of the website to more explicitly provide links to see older minutes etc.</li> <li>No history of meetings/agendas or clear identification of issues was provided.</li> </ul> </ul>		

Appendix 4	Appendix 4 - Customer and Consumer Rights Detailed Audit Findings (Part4)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor comments at the audit meeting			
	<ul> <li>website;</li> <li>(8) procedures for tracking issues raised and ensuring appropriate follow-up of those issues; and</li> <li>(9) funding and resourcing of the Customer Council by Sydney Water including sitting fees and expenses for members.</li> </ul>							
4.5.2 (b) Context	Either Sydney Water or the Customer Council may 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.	Not significant Risk Operation of Customer Council.			Evidence Provided: Copy of meeting minutes from September 2010. Audit Comments: Minutes reflected that the Council were happy with the changes to the charter. Viewed a summary of the Customer Council Charter changes, this is updated every 2.5 years unless Members request a change in the interim.			

# Appendix 5 Complaint and Dispute Handling Detailed Audit Findings (Part 5)

Appendix	Appendix 5 Complaint and Dispute Handling Detailed Audit Findings (Part 5)						
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary		
5.1	Internal Dispute Resolution Process						
5.1 (a) Audit	Sydney Water must establish and maintain internal complaint handling procedures for receiving, responding to and resolving Complaints by Customers and Consumers against Sydney Water.	Moderate Risk Operation of complaints handling system.	The internal complaint handling procedures mentioned in the obligation have been established and maintained.	Full	<ul> <li>Evidence:</li> <li>A copy of Sydney Water's Customer complaints Policy &amp; Procedures will be tabled at the audit.</li> <li>A copy of the Policy is available on the following website under 'Support customer relations'</li> <li><u>http://www.sydneywater.com.au/Publications/Policies.cfm</u></li> <li>Complaints are recorded and managed through Sydney Water's Customer Management System (CMS).</li> </ul>		
					Commentary: The policy and examples were sighted during the audit. The Contact centre has detailed processes in place for frontline staff. Definition of complaint – customer being dissatisfied with Sydney Water. Customer service representatives are all trained and the system guides staff to input mandatory information. A full time quality assurance person is available to randomly select phone calls to monitor that staff have adhered to policy and procedures. These are monitored and results are then fed back to the operators. If staff have been employed for less than 12 months in the organisation the QA person may monitor up to 10 of their calls per week. Staff turnover is low for this type of work at approx. 10%/annum. There is a high internal turnover to provide variety and backup that assists in managing peaks and troughs and maintaining quality through stability of the workforce.		

Appendix	Appendix 5 Complaint and Dispute Handling Detailed Audit Findings (Part 5)						
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary		
					Actually allow 85% of day available for talking to customer. The other 15% is available for research, review of priorities etc. external turnover is not seen as an issue for the organisation. There are significant training costs with high turnover and therefore measures are in place to keep staff engaged. With other contact centres turnover is around 25% or is outsourced overseas. Overseas call centres are very much (negatively) in the mind of customers. Sydney Water is proactively handling its customer call centre to maintain high standards and quality. This is to be commended.		
5.1 (b) Audit	The internal complaints handling procedures of Sydney Water must be based on the Australian Standard AS/ISO 10002: 2004 MOD Customer Satisfaction – Guidelines for Complaint Handling, as amended or replaced from time to time.	Moderate Risk Operation of complaints handling system.	The internal complaints handling procedures are based on the Australian Standard AS/ISO 10002: 2004 MOD Customer Satisfaction – Guidelines for Complaint Handling, as amended or replaced from time to time.	Full	<ul> <li>Evidence Provided:</li> <li>Refer to NWI Report – Complaint Handling indicators and commentary on improvement activities.</li> <li>Audit Comments:</li> <li>Procedures and wording are very similar to the wording to the Australian Standard.</li> </ul>		
5.1 (c) Audit	Sydney Water must make available to Customers and Consumers information concerning its internal complaints handling procedures which explains how to make a Complaint and how the complaint handling procedure works.	Moderate Risk Information about the complaints handling system.	Information concerning the internal complaints handling procedures described in the obligation has made available to Customers and Consumers.	Full	<ul> <li>Evidence Provided:</li> <li>Refer the pamphlet "Our contract with you" brochure, which is available any time.</li> <li>Also refer SW Website Complaint page which sets out complaints procedures. Helping Customers&gt;Complaints&gt;</li> <li><a href="http://www.sydneywater.com.au/CustomerServices/Complaints/">http://www.sydneywater.com.au/CustomerServices/Complaints/</a></li> <li>Audit Comments:</li> <li>Web pages have been viewed, these could be clearer i.e. put in a flow chart showing the process etc. Also a link could be added to the policy or other notes to identify where to look to find out about the complaints procedures.</li> <li>Water Wrap – this has a "share your views" section and refers customers to EWON if there are any problems. Customers are advised regarding the complaints handling process annually via the Water Wrap insert and the</li> </ul>		

Appendix	Appendix 5 Complaint and Dispute Handling Detailed Audit Findings (Part 5)						
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary		
					<ul> <li>website outlines complaints information. Additional information could also be added onto the customer bills.</li> <li>The complaints register in the CMS (Complaint Management System), has auto assignment rules which will send complaints to a particular person, and email is also provided which contains links to the complaint with timeframes to resolve.</li> <li>Reports are produced daily on different complaint categories.</li> <li><b>Opportunities for Improvement:</b></li> <li>What happens in terms of complaint management is currently buried in policy and the customer contract and needs to have link on complaints page to the process.</li> </ul>		
5.1 (d) Audit	Sydney Water must provide information of the nature described in clause 5.1(c) to Customers through their quarterly, or other, bills at least once annually.	Moderate Risk Information about the complaints handling system.	The information described in clause 5.1(c) has been provided to Customers through their bills at least once annually.	Full	<ul> <li>Evidence Provided: <ul> <li>Refer the pamphlet "Our contract with you" (see above).</li> <li>This information was sent out with the Spring 2010 residential bill.</li> </ul> </li> <li>Audit Comments: <ul> <li>Water Wrap is sent out and has a "share your views" section; this does not quite cover the requirements of this clause. Sydney Water will add some condensed wording around what the process is following a complaint being made. SW will update the "our Contract with you" brochure and the website and in the Water Wrap etc. Cross referencing appropriately would also be sufficient.</li> </ul> </li> <li>Opportunities for Improvement: <ul> <li>Some condensed information needs to be added in a few lines regarding how SWC will respond to complaints this needs to be added into the "Contract in Brief" and the website and should provide a cross reference to the website.</li> </ul> </li> </ul>		

Appendix	Appendix 5 Complaint and Dispute Handling Detailed Audit Findings (Part 5)						
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary		
5.2	External Dispute Resolution Scheme						
5.2 (a) Audit	Sydney Water must establish or be a member of an industry based dispute resolution scheme for the resolution by a dispute resolution body of disputes between Sydney Water and its Customers and between Sydney Water and Consumers.	Moderate Risk Operation of dispute resolution system.	Sydney Water has established or been a member of an industry based dispute resolution scheme.	Full	Evidence Provided:         Refer the pamphlet "Our contract with you".         Refer EWON website         http://www.ewon.com.au/index.cfm/about-us/our-members/         Audit Comments:         Viewed web page attachment in "Sydney Water's Complaint Policy pdf"         EWON website viewed, customer contract schedule two also viewed.		
5.2 (b) Audit	Any industry based dispute resolution scheme so established by Sydney Water is subject to the Minister's approval.	Low Risk Ministerial approval of dispute resolution system.	The Minister has approved the industry based dispute resolution scheme.	Full	Audit Comment Confirmed.		
5.2 (c) Audit	<ul> <li>Sydney Water must:</li> <li>prepare a pamphlet that explains how the dispute resolution scheme operates and how it can be accessed; and</li> <li>provide that pamphlet to Customers through their quarterly or other bills, at least once annually.</li> </ul>	Moderate Risk Information about dispute resolution system.	A pamphlet has been prepared and distributed as described in the obligation.	Full	Evidence Provided: Refer the pamphlet "Our contract with you". Refer EWON website <u>http://www.ewon.com.au/index.cfm/about-us/our-members/</u> Audit Comments: Schedule 2, customer contract 12.1 and 12.2, then 12.3 and 12.4 for resolution of disputes. EWON information on the Water Wrap and business customers pamphlet.		

# Appendix 6 Environment – Indicators & Management Detailed Audit Findings (Part 6)

Appendix	x 6 Environment – Indicators & Management Detailed Audit Findings (Part 6)						
Clause	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11	Auditor Commentary		
And				Audit Grade			
Scope							
6.1	Environment management						
6.1 (a)	Sydney Water must maintain an	High Risk	Environmental management	Full	Evidence:		
Audit	environmental management system certified to AS/NZS ISO 14001:2004 (as	The	system certified to AS/NZS ISO 14001:2004 (as updated		Interview with relevant staff, 14/09/2011, at Sydney Water Offices, 1 Smith		
	updated from time to time) to manage	Management	from time to time) to		Sileet, Fair an analia.		
	environmental risk of its business and service delivery.		ending 30 June 2011 (Environmental_Management_Folio 2010-11.pdf)				
		delivery.		global-mark <sup>®</sup> Certificate of Approval for Sydney Water Environmental Management System – SWEMS to Certification Standard AS/NZS ISO 14001- 2004 Certificate Last Update Date 2/05/2011 ( <i>Clause 6.1(a)_SWEMS re-</i> <i>certification certificate and audit report.pdf</i> )			
					Global-Mark Business review report EMS 2011 EMS Recertification ( <i>Clause</i> 6.1(a)_SWEMS re-certification certificate and audit report.pdf).		
					Sydney Water Environmental Management System SWEMS Manual SWEMS0001 Version 9		
					Environmental Planning Procedure SWEMS 0004 (Clause 6.1(b)_SWEMS0004 - Environmental Planning Procedure.pdf)		
					Commentary:		
					The Sydney Water Environmental Management System forms the fulfilment for this clause.		
					The approved company/site address is 1 Smith Street Parramatta. Global- Mark found that Sydney Water's operation met the requirements of AS/NZS		

Appendix	idix 6 Environment – Indicators & Management Detailed Audit Findings (Part 6)							
Clause	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11	Auditor Commentary			
And				Audit Grade				
					ISO 14001:2004 and Global-Mark recertified the organisation. The certification applies to the Sydney Water Environmental Management System, which applies across all of Sydney Water's operations. Various documents as well as the electronic directory were viewed as evidence for compliance against this clause. Staff members were able to source documents and records from the system when requested. Note that the operational area of Sydney Water working under the Waste Water Integrated Management System has a separate AS/NZS ISO 14001 certification.			
6.1 (b) Audit	<ul> <li>Sydney Water must prepare a Five Year Environment Plan in accordance with the environmental management system in clause 6.1(a) by 30</li> <li>September 2010. The Five Year Environment Plan must:</li> <li>include Sydney Water's environmental objectives;</li> <li>contain details of Sydney Water's program to meet the environmental objectives including targets and timetables;</li> <li>endorse the principles of ecologically sustainable development;</li> <li>be integrated into Sydney Water's business plans; and</li> <li>be posted on Sydney Water's website for downloading by any person free of charge. A copy of the plan must be provided to any</li> </ul>	High Risk The 5 year plan sets out how the Environmental Management System is to be implemented.	Five Year Environment Plan in accordance with the environmental management system in clause 6.1(a) established by 30 September 2010. The Five Year Environment Plan includes all of the details set out in the licence requirement.	Full	Evidence: Interview with relevant staff, 14/09/2011, at Sydney Water Offices, 1 Smith Street, Parramatta. Sydney Water Environment Plan 2009–2014 Annual Progress Report Folio of Progress: Environment Management covering the reporting period ending 30 June 2011 ( <i>Environmental_Management_Folio 2010-11.pdf</i> ) Environment Plan 2010–2015 Sydney Water's objectives and actions to manage and improve environmental performance SWEMS0004.02v2 ( <i>Clause 6.1(b)_SWEMS0004.02v2 - Environment Plan 2010-2015.pdf</i> ) Sighted website with Progress Report and EP (09/09/2011) Environment Plan 2010-2015 Reporting Template ( <i>Clause 6.1(b)_EP 2010-15 reporting template and Sustainability Divisional Plan.pdf</i> ) Significant Environmental Risks 2011 ('Aspects and Impacts Register') (viewed live on 14/9/2011). Divisional Business Plan 2010-11 Draft 26 Mar 10 Asset Management Division ( <i>100326 AMD Bus Plan 1011 DRAFT_MD budget prespdf</i> ) Sydney Water EMS OC Managing Environmental Risks In Contracts SWEMS0015 Version 6 ( <i>SWEMS0015 Managing Environmental Risks in Contracts.pdf</i> )			

Appendix 6	x 6 Environment – Indicators & Management Detailed Audit Findings (Part 6)						
Clause	<b>Operating Licence Obligation</b>	Risk	Target for Full Compliance	2010/11	Auditor Commentary		
And				Audit Grade			
Scope							
	member of the public free of charge				Commentary:		
	upon request.				An Environment Plan (EP) 2010-2015 is in existence. The draft EP 2011-2016 was also provided to show evidence of the rolling review process of EP development. Evidence relating to the sub-clauses is provided below:		
					<ul> <li>The EP includes SWC's environmental objectives Precautionary principle, Inter-generational and intra-generational equity, Conservation of biological diversity and ecological integrity, Improved valuation and pricing of environmental resources (page 2). The framework for preparing and developing the EP is covered within SWEMS 004 <i>Environmental Planning Procedure</i>.</li> </ul>		
					• EP includes a table citing targets and due dates for reaching targets (Page 4-9).		
					• EP endorses principles of ESD as shown specifically in the objectives stated at (1).		
					• Business-wide actions are stated within the EP table (Page 4-9). Integration of actions is directed through SWEMS 004 <i>Environmental</i> <i>Planning Procedure</i> . Actions were also viewed at the next level down within an Asset Management Division Divisional Business Plan.		
					• EP was sighted on the SWC website (www.sydneywater.com.au/Publications/Factsheets/EnvironmentPlan. pdf) on 12 September 2011.		
					Several contractor issues were noted in the reporting template including one Tier 3 Penalty Notice (under the <i>Protection of the Environment</i> <i>Operations Act 1997</i> ) issued to a Sydney Water biosolids contractor (Environment Plan 2010-2015 Reporting Template). Evidence was therefore sought on how SWC manages contractors through its SWEMS. Contractor performance is managed through several avenues including via environmental induction, environmental training and SWC audit (via an Internal Audit Schedule) as required necessary to evaluate contractor environmental performance. SWC maintains an aspects and impacts register as part of its EMS. The register can be used to capture all risks including		

Appendix	ndix 6 Environment – Indicators & Management Detailed Audit Findings (Part 6)						
Clause	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11	Auditor Commentary		
And				Audit Grade			
Scope							
					those from contractors. At a corporate level, SWC uses a software system called 'NoRisk' (not sighted) which is used to capture all corporate risks – key environmental aspects and impacts are captured within NoRisk.		
6.1 (c)	Sydney Water must complete an	High Risk	Annual progress report in	Full	Evidence:		
Audit	annual progress report in accordance with the Reporting Manual, outlining	The annual progress report	accordance with the Reporting Manual, outlining		Interview with relevant staff, 14/09/2011, at Sydney Water Offices, 1 Smith Street Parramatta		
	details of Sydney Water's progress	sets out	details of its progress with		Sydney Water Environment Plan 2009–2014 Annual Progress Report		
	targets and timetable.	performance against the	objectives, targets and timetable.		Operating Licence Compliance Report Schedule 3 Environmental Performance Indicators 2009-2010.		
	Environmental Management System.			Email between SWC and IPART Thursday 30 September 2010 10:26 am noting that Environment Plan 2009-2014 Progress Report and Environment Plan 2010-2015 had been supplied to IPART.			
					<i>Draft</i> Sydney Water Operating Licence Environment Report Environment Plan 2010–15 Annual Report Environmental Indicators Report 2010–11 SWEMS004.02v3		
					<i>Draft</i> Environment Plan 2011–2016 Sydney Water's objectives, targets and actions to manage and improve environmental performance		
					Commentary:		
					SWC produced an Annual Progress Report for its Environment Plan 2009- 2014 and an Operating Licence Compliance Report Schedule 3 Environmental Performance Indicators which comply with the requirements of the Reporting Manual.		
					The reports were transmitted to IPART on 30 September 2010 (email from SWC to IPART).		
6.1 (d)	Each year Sydney Water must review	High Risk	Review of the Five Year	Full	Evidence:		
Audit	the Five Year Environment Plan by	The review is	Environment Plan by		Environment Plan 2010–2015 Sydney Water's objectives and actions to		
	environmental non-governmental	important to keep	peak environmental non-		manage and improve environmental performance SWEMS0004.02v2		
	organisations to determine whether any changes to the Five Year	the Environment	governmental organisations to determine any changes to		Letter from DECCW to SWC dated 15/3/11 (noting that SWC had written to DECCW on 2/12/10) Subject: Sydney Water's Environment Plan and Progress		

Appendix	oppendix 6 Environment – Indicators & Management Detailed Audit Findings (Part 6)							
Clause	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11	Auditor Commentary			
And				Audit Grade				
Scope								
	Environment Plan are required in the	Plan.	the Five Year Environment		Report 2009-2010 Annual Consultation.			
	subsequent year and the nature of those amendments.		Plan and the nature of those amendments.		Letter from SWC to DECCW dated 2/12/10 Subject: Sydney Water 2010 Annual Report Summary.			
					Environmental reporting: Summary of annual requirements and processes SW / OEH Joint Operating Group meeting 3 May 2011 (Powerpoint presentation)			
					Agenda: Sydney Water Corporation & Office of Environment and Heritage 4th Joint Operating Group (JOG) Meeting Date: Tuesday 3 May 2011 Time: 12.30 pm – 4.00 pm Location: Sydney Water Headoffice – level 4 Sydney Cove conference room HO 4-07			
					Commentary:			
					EP contains an objective of "Maintain good relationships with Department of Environment, Climate Change and Water (DECCW)" – noting that this department is now OEH.			
					A letter was sighted from DECCW to SWC detailing comments on the EP and PR.			
					DECCW (OEH) provided comments on the Environment Plan and Progress Report 2009-2010. One set of comments concerned a perceived issue on the 'changes to reporting status of targets'. Sydney Water was able to produce a JOG meeting agenda, minutes (Item 6: Strategic Issues Agenda 6.1 Presentation on Environmental Reporting) and Powerpoint presentation to show how this issue was satisfactorily addressed with the then DECCW.			
					PENGOS (peak environmental non-governmental organisations), which SWC consulted, are the Total Environment Centre and the Nature Conservation Council. No evidence was shown for replies from the Total Environment Centre and the Nature Conservation Council as no replies were received.			
6.2	Environment indicators							
6.2 Audit	<ul><li>Sydney Water must:</li><li>monitor, record and compile data on the Environmental Performance</li></ul>	High Risk Environmental Indicators are a	Sydney Water has compiled and reported Environmental Performance Indicators as set	Full	Evidence: Folio of Progress: Environmental Indicators for reporting period ending 30			

Appendix	ndix 6 Environment – Indicators & Management Detailed Audit Findings (Part 6)							
Clause	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11	Auditor Commentary			
And				Audit Grade				
Scope								
	Indicators; and	requirement of	out in the obligation.		June 2011 (Environmental_Indicators_Folio 2010-11.pdf).			
	<ul> <li>report on the Environmental Performance Indicators, in accordance with its obligations</li> </ul>	the Sydney Water Act.			Operating Licence Compliance Report Schedule 3 Environmental Performance Indicators 2009–10 ( <i>Clause 6.2</i> <i>OperatingLicenceComplianceReportSchedule3EnvironmentalPerformanceInd</i> <i>icators2009-10 pdf</i> and accessed via website 13/9/2011)			
	under the Reporting Manual.				Letter from Sydney Water to IPART dated 28/9/2010) covering transmittal of Environmental Performance Indicators (Schedule 3) Report 2009-2010, Environment Plan 2009-2014 Progress Report and Environment Plan 2010- 2015 (SW Ref: CR006748).			
					Email between Sydney Water and IPART Thursday 30 September 2010 10:26 am noting that Environment Plan 2009-2014 Progress Report and Environment Plan 2010-2015 had been supplied to IPART.			
					Commentary:			
					<b>OFI:</b> Email between Sydney Water and IPART: It is not clear that the IPART author is a representative of IPART in the email, nor is there any mention of IPART in the email's subject line. The information contained in transmittal emails to the regulator/s needs to be more structured for future correspondence.			
					The Operating Licence Compliance Report on the Schedule 3 Environmental Performance Indicators provides evidence that SWC is reporting appropriately against its designated indicators.			
					The Schedule 3 report was transmitted to IPART on 28/9/10.			

# Appendix 7 Water Conservation Detailed Audit Findings (Part 7)

Appendix	7 Water Conservation Detailed Audit Findings (Part 7)						
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary		
7.1	Water Usage Level						
7.1 (a) Audit	Sydney Water must reduce the quantity of Drinking Water 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) by 30 June 2011.	High Risk Water usage level is an important demonstration of commitment to water conservation.	The quantity of Drinking Water drawn from all sources at 30 June 2011 is equal to, or less than, 329 litres per person per day.	Full	<ul> <li>Evidence Provided:</li> <li>(a) Water Efficiency Report At a Glance (p4) and Section 1.2 (p8).</li> <li>(b) LCD calculation - total bulk water volume (source Hydraulic Operations) divided by the mid year population. Population figures (source Dept Planning) put in evidence file.</li> <li>(c) Analysis of potential uncertainty in LCD calculation done in 2009 (Uncertainty in LCD calculation report). The analysis suggests that the error in the total water demand meter reading is +/-2%.</li> <li>Comments:</li> <li>Water efficiency report states last years water usage as 304L/p/d which meets the clause target.</li> <li>Discussion was provided on calculations and likely errors.</li> <li>Audit Comments:</li> <li>A sound analysis has been undertaken. Evidence of the methodology and likely errors was provided.</li> </ul>		
7.1 (b) NR in 2010/11 Audit	Thereafter, Sydney Water must continue to maintain the Water Usage Level for the remainder of the term of the Licence, to be measured at 30 June						

Appendix	endix 7 Water Conservation Detailed Audit Findings (Part 7)						
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary		
	each year.						
7.1 (c) Audit	In calculating water usage for the purposes 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.	High Risk Weather adjustments provide more meaningful results for the water usage level.	Adjustments to the water usage level that take account of the effects of weather, using a methodology approved by IPART.	Full	<ul> <li>Evidence Provided:</li> <li>Water Efficiency Report Appendix 2 (p33).</li> <li>Climate Correction Model user manual and review.</li> <li>Comments:</li> <li>Also Daily water tracking manual by MWH, modelling</li> <li>Climate corrected demand model –</li> <li>Audit Comments:</li> <li>A climate correction model is applied. In 2009 SWC validated the climate correction model.</li> </ul>		
7.1 (d) Audit	If Sydney Water fails to meet the Water Usage Level in a particular year, Sydney Water must demonstrate, to the satisfaction of IPART, that it would not have been reasonable to meet the Water Usage Level in that year.	Moderate Risk Failure to meet the water usage level explained.	A satisfactory explanation of any failure to meet the Water Usage Level.	Full	Audit Discussion: (Agreed that this is not an issue as water usage level has been met and well within target).		
7.1 (e) NR	Sydney Water must undertake a review of the water usage level as part of the end of term review of this licence						
7.2	Water Leakage						
7.2 (a) Audit	Sydney Water must ensure that the level of water leakage from its Drinking Water supply system (the Water Leakage Level) does not exceed 105 megalitres per day.	High Risk Attention to water leaks is an important demonstration of commitment to	The level of water leakage from Sydney Water's Drinking Water supply system is equal to or below 105 megalitres per day.	Full	Evidence Provided: Water Efficiency Report Section 3 Comments: 2011 leakage was estimated at 106 ML/day, inside uncertainty of +/-16 megalitres/day		

Appendix	7 Water Conservation Detailed Audit Findings (Part 7)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary			
		water conservation.			Audit Comments: Sydney Water has undertaken many years of work programmes to achieve the target and are now moving into a maintenance phase. Sydney water has achieved a leakage reduction of 106ML/d which is well within the +/-16 ML/d error calculation. Maintaining ELL The pressure management programme is thought to bring in significant benefits to this target. Sydney Water expects to counter balance the rolling back of the Active Leak Detection Programme with the introduction of the pressure management programme. The pressure management programmes are currently being commissioned. As a result of the pressure management programmes, the number of breaks and leaks should fall and therefore the requirement to survey these areas will drop as well (at least in the first year). SWC will monitor the behaviour of pressure reduction areas e.g. defer any renewals programmes in pressure management areas. The resulting life extension being achieved will be monitored and aligned with the leakage strategy and linked to asset management improvements in lifecycle management. Dedicated staff are available to negotiate and work with customers as over 20% of the Sydney network will be pressure managed. Over 400,000 letters have been sent to customers.			
7.2 (b) Audit	When calculating the Water Leakage Level each year, Sydney Water must use the assumptions and methodology approved by IPART.	High Risk Water leakage must be calculated using a robust methodology.	Use of assumptions and methodology approved by IPART in calculating the Water Leakage Level.	Full	Evidence Provided: Water Efficiency Report Appendix 3 Comments: Confirms methodology is in line with that approved by IPART, National Water Commission's reporting handbook referred to. Audit Comments: The procedure of calculation methodology has not changed from the last audit and the IPART approval. No change.			
7.2 (c)	Sydney Water must complete a review	High Risk	Adequate progress towards	Full	Evidence Provided:			

Appendix	dix 7 Water Conservation Detailed Audit Findings (Part 7)						
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary		
Audit	by 31 December 2011 to determine the economic Water Leakage Level and submit a report on this review to IPART. The review must be conducted in a manner acceptable to IPART.	Adequate progress of the review.	completion of the review to determine the economic Water Leakage Level by 31 December 2011.		<ul> <li>Water Efficiency Report Appendix 4</li> <li>Comments:</li> <li>Discusses ELL but evidence does not address the review 31<sup>st</sup> Dec and whether it will submit a report to IPART and the acceptability to IPART.</li> <li>Audit Comments:</li> <li>There is a need to provide a revised analysis of ELL with approval of the review process to be conducted by IPART. Sydney Water plans to provide the scope and methodology for consultation to IPART.</li> <li>A consultant has been engaged to review the leakage programs and contribute to developing the methodology for determining ELL. Compliance is outside of the scope of this audit.</li> <li>At the time of the audit interview, no project plan was available for meeting the 31st December 2011 deadline although delivery of the project to the deadline is contained in the two Project Managers' PDP (Performance Development Plans).</li> <li>The clarification and provision of further evidence subsequent to the audit interview suggests that Sydney Water has a clear plan for achieving compliance and is on track to meet compliance.</li> </ul>		
7.2 (d) NR							
7.2 (e) NR							
7.3	Water efficiency programs						
7.3 (a) Audit	Sydney Water must undertake and promote water efficiency programs.	High Risk. Water efficiency programs are an important demonstration of	Operation and promotion of water efficiency programs.	Full	Audit Comments: Sydney Water is proactively managing its water efficiency programs to maximise organisational and community benefit. The general rebate programs are being wound back and a stronger focus is		

Appendix	7 Water Conservation Detailed Audit Findings (Part 7)						
Clause And	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary		
Scope							
		commitment to water conservation.			being made to the linking of customer hardship data to leakage data and providing support to customers who need assistance, for example through the plumb assist program. This program is free to customers assessed as suffering hardship.		
					The Program of support includes:		
					(a) Dealing with property management, electricity issues connected with water leaks, repairs of leaks, leak damage.		
					(b) Provision of water efficient appliances to pro-actively address future hardship.		
					(c) Reviewing how to deal with tenant/landlord issues and capital repairs to rental properties.		
					Sydney Water has already reviewed all Department of Housing properties under WaterFix.		
					Decision making for dropping programs includes prioritisation based on levelised cost/benefit.		
					The program is peer reviewed utilising external consultants and post implementation reviews are being addressed.		
					Use water savings over time and cost to determine value of the programmes.		
					Levelised costs – when these go up this is an indicator, some rebate programmes designed to shift a market then they slow down. Do different analysis for each programme, e.g. bizfix – understand uptake.		
					Undertook programme reviews last year and also have peer reviewed externally by consultants.		
					Not comparing with other agencies, doing a post efficiency review and will provide data to other water agencies or councils.		
7.3 (b)	Sydney Water must give due	High Risk.	Water efficiency and other	Full	Evidence Provided:		
Audit	consideration to water efficiency and	Water efficiency	water conservation measures		Water Efficiency Depart Section 6		
	other water conservation measures as part of planning the future provision of	programs are an	are fully considered as part of planning the future provision		ייאמניו בווונופוונץ הפסיד Section 6.		

Appendix	Appendix 7 Water Conservation Detailed Audit Findings (Part 7)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary			
	its Services, including addressing water leakage.	important demonstration of commitment to water conservation.	of services.		Sustainability Planning Manual Options Library documentation Audit Comments: Review processes include full integration of activities.			
7.4	Water recycling program (including stormwater)							
7.4 (a) Audit	Sydney Water must promote, foster and encourage the production and use of Recycled Water in the Area of Operations.	High Risk. Water recycling is an important element of water conservation.	Production and use of recycled water Evidence to demonstrate that Sydney Water is promoted, fostered and encouraged.	Full	Evidence Produced: Water Efficiency Report Section 4.			
					Audit Comments: 18 recycling schemes being operated. The internal recycling schemes are itemised in Table 7 of the Water Efficiency Report. St Marys came on line last October, around 18 billion L/year. Also had an education centre at the plant opened in January 2011. Rosehill - will be commissioned this year, this can supply up to 4.5 billion litres of water per year. This is a WICA scheme which is a privately funded project with six industrial customers and will sell water to Sydney Water. Hoxton Park - which comes on line in 2013. There is also a residential scheme which has dual reticulation, currently running potable water. Sydney Water is currently working through seven different projects with interested parties; some haven't ended up in a scheme but will continue working through with customers. E.g. Malibar, 4 golf courses - the high cost of the scheme was prohibitive. Sydney Water is promoting recycled water use through doing it themselves, engaging with local government etc. Some parties do approach Sydney water directly and there is an evaluation process in place to follow to establish			

Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary			
					<ul> <li>whether the process is viable. There are gateways by stage.</li> <li>Capacity building workshops were held with local government (Water Efficiency Report 4.2) - this has clarified processes with local government, e.g.: <ul> <li>What a viable program is</li> <li>How recycled water can be implemented.</li> <li>Stormwater recycling options</li> </ul> </li> <li>Sydney Coastal Council Group met in 2010 - the outcome was to develop a recycled water handbook. This would be a guide for potential customers to understand the process and initial assessment process. The main audience is local government, developers and commercial customers. This is due out in early 2012.</li> <li>Sydney Water is providing access to the wastewater system and stormwater. Sewer mining is however fundamentally more expensive than potable water.</li> </ul>			
					<ul> <li>There is no clear understanding of the costs and benefits of recycled schemes last November Australia Water Recycling Centre of Excellence issued a research request to investigate Triple bottom line costs/benefits of projects. The Institute of Sustainable Futures, Sydney Water, IPART and local government are partners in this cost/benefit research project.</li> <li>The project will commence in November 2011 – project has funding and will continue for a period of 18 months.</li> <li>IPART Guidelines state that recycling projects have to be self-funding i.e. customer revenue needs to pay for the scheme. The Research Project is looking at other beneficiaries that benefit from the projects and how they could be assisting with the funding.</li> <li>Projects are generally only viable if participants are willing to fund the high cost, usually as a result of external benefits, for example: <ul> <li>Bligh St – world's leading six star building</li> <li>Centerpoint – leveraging recycled water for tower 'greening'</li> </ul> </li> </ul>			
Appendix	opendix 7 Water Conservation Detailed Audit Findings (Part 7)							
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Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary			
7.4	Sydney Water must meet any target	High Risk.	Any target relating to the	Full	management. Evidence Provided:			
(b)(1) Audit	of Recycled Water set by the Minister from time to time consistent with the objectives of the Metropolitan Water Plan; and	Water recycling is an important element of water conservation.	production and/or use of Recycled Water that has been set by the Minister has been met.		Water Efficiency Report Section 4. Audit Comments: There is no target in place. N/A.			
7.4 (b)(2) Audit	Sydney Water must implement any particular Recycled Water schemes indicated by the Minister so as to meet any target in clause 7.4(b)(1) above.	High Risk. Water recycling is an important element of water conservation.	Particular Recycled Water schemes indicated by the Minister have been implemented so as to meet any target in clause 7.4(b)(1).	Full	Evidence Provided: Water Efficiency Report Section 4. Audit Comments: No target in place, no request by the Minister. N/A.			
7.4 (c) Context	Sydney Water is not required to undertake any Recycled Water scheme where it is not financially viable to do so.	Moderate Risk Explanation of failure to undertake a recycled water scheme.	A satisfactory explanation of any failure to undertake a recycled water scheme.		Audit Comments: Some recycled schemes have been directed by the Minister to IPART to include some schemes in the pricing determination. No failure to undertake a scheme in alignment with the Clause.			
7.5	Water Conservation Strategy Document and annual report							
7.5 (a) Audit	<ul> <li>Sydney Water must prepare and submit to IPART and the Minister by 31</li> <li>December 2010 a Five Year Water</li> <li>Conservation Strategy Document</li> <li>covering the term of the Licence. The</li> <li>Five Year Water Conservation Strategy</li> <li>Document must include details of:</li> <li>strategies relating to water</li> <li>leakage;</li> <li>strategies relating to Recycled</li> </ul>	High Risk. Five year strategy demonstrates a commitment to water conservation.	Prepare and submit to IPART and the Minister by 31 December 2010 a Five Year Water Conservation Strategy Document covering the term of the Licence.	Full	Evidence Provided:         Water Conservation Strategy and link to report on Sydney Water website         (http://www.sydneywater.com.au/Publications/PlansStrategies/Sydney_Wat         er's water conservation strategy for 2010-2015.pdf         Letter to IPART sent with Water Conservation Strategy.         Audit Comments:         Water conservation strategy produced, alignment with Clause requirements are:         1 Section 3.4			

Appendix	ppendix 7 Water Conservation Detailed Audit Findings (Part 7)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary			
	<ul> <li>Water;</li> <li>strategies relating to water efficiency;</li> <li>how the water conservation strategies outlined in paragraphs (a)(1) – (a)(3) above contribute to the objectives and targets outlined in the Metropolitan Water Plan.</li> </ul>				<ul> <li>2 Section 3.5</li> <li>3 Section 3.6</li> <li>4 Appendix 2</li> <li>It is noted that the Strategy incorporates a multi-agency response to conservation management issues and Sydney Water may or may not have control or be able to influence any specific parts of the strategy</li> </ul>			
7.5 (b) Audit	The Five Year Water Conservation Strategy Document must provide an analysis of current and future programs and projects being undertaken, and expected to be undertaken, by Sydney Water. In particular, the Five Year Water Conservation Strategy Document must outline Sydney Water's water conservation objectives, targets and timetable for the entire term of the Licence.	High Risk. Water Conservation strategy must be robust.	Details of the Five Year Water Conservation Strategy Document as set out in the obligation.	Full	Evidence Provided: Water Conservation Strategy Section 2 (p4-7). Water Conservation Strategy Section 3 (p8-14). Audit comments: Targets and timeframes on page 11.			
7.5 (c) Audit	Sydney Water must provide an annual report on its progress in implementing its water conservation strategies in accordance with the Reporting Manual. The annual report must include an explanation of how work done for the purpose of implementing the water conservation strategies undertaken during the year contribute to the objectives and targets outlined in the Metropolitan Water Plan.	High Risk. Progress on the Water Conservation strategy needs to be demonstrated.	An annual report on progress in implementing water conservation strategies in accordance with the Reporting Manual.	Full	Evidence Provided:Copy of the Water Efficiency Report as supplied to IPART and letter ofsubmission.2010-15 Operating Licence Reporting Manual, Section 4 (p8-11).Water Efficiency Report, Appendix 1 (p32 - checklist of reporting againstReporting Manual).Links to the Metropolitan Water Plan, Water Efficiency Report Section 1.3,Water Conservation Strategy Appendix 2 (p17).Audit Comments:Appendix 1 page 32 of the Efficiency Report provides a matrix analysis againstReporting Manual.The links to targets and objectives are contained in Section 1.3.			

Appendix	x 7 Water Conservation Detailed Audit Findings (Part 7)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary			
					Sydney Water utilises long run marginal cost evaluations as part of its cost benefit analyses. These evaluations are equivalent to the methodologies utilised in its economic level of leakage analysis. Working with Leakage team in aligning methodological approaches.			
7.5 (d) Audit	<ul> <li>The following documents must be placed on Sydney Water's website:</li> <li>the annual report on Sydney Water's progress in implementing its water conservation strategies required under clause 7.2(c); and</li> <li>the Five Year Water Conservation Strategy Document.</li> </ul>	Moderate Risk. Publication of the Water Conservation strategy.	The documents nominated in the licence requirement have been placed on Sydney Water's website.	Full	Evidence Provided: 2009-10 report is available at: <u>http://www.sydneywater.com.au/Water4Life/WhatSydneyWaterIsDoing/Initiatives.cfm</u> 2010-11 Water Efficiency Report will be loaded onto the website concurrently with the Annual Report (around late November). The communications project brief for Water Efficiency Report shows plan for 2010-11 report to be loaded onto website. Water Conservation Strategy link on Sydney Water website ( <u>http://www.sydneywater.com.au/Publications/PlansStrategies/Sydney_Waterer's water_conservation_strategy for_2010-2015.pdf</u> ).			
					Audit Comments: New versions in November with the annual report. The Five Year Conservation Strategy has been up for a while. Links to last year's Water Conservation report and this year's report will go up in November. Approved in August and then up in November.			

# Appendix 8 Reporting and Maintaining Records Detailed Audit Findings (Part 9)

Appendix 8	8 Reporting and Maintaining Records Detailed Audit Findings (Part 9)							
Clause And	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary			
Scope								
9	Reporting and maintaining records							
9 (a) Audit	Sydney Water must comply with its reporting obligations set out in the Reporting Manual and must report to IPART in accordance with the Reporting Manual.	Low Risk Performance monitored by IPART.	Compliance with reporting obligations as set out in the Reporting Manual.	Full	<ul> <li>Evidence:</li> <li>Interview with relevant staff, 14/09/2011, at Sydney Water Offices, 1 Smith Street, Parramatta.</li> <li>Letter from SWC to IPART dated 25/8/2011 (<i>Ltr SWC to IPART_OL 1 Sept reports 2010-11.pdf</i>)</li> <li>Courier Parcel Receipt dated 01/09/2011Time 7:56:06 am from Sydney Water to IPART (scanned copy provided by Sydney Water).</li> <li>Email from Sydney Water IPART 1 September 2011 8:27 am noting that hard copy reports of the annual compliance reports for Sydney Water and the SDP (assume Sydney Desalination Plant) had been couriered to IPART.</li> <li>Email from IPART to Sydney Water 1 September 2011, 8:44 am noting receipt of email.</li> <li>Commentary:</li> <li>The letter shows that SWC has supplied its suite of annual compliance and performance reports as required under the 2010-2015 OL.</li> <li>Further evidence was noted to add weight to the full compliance of this clause in particular a courier and follow un amails between Sydney Water</li> </ul>			
					and IPART.			
9 (b)	Sydney Water must provide to NSW	Low Risk	Providing NSW Health with a	Full	Evidence:			
Audit	Health a copy of any report referred to	Performance	copy of all reports referred to		Interview with relevant staff, 14/09/2011, at Sydney Water Offices, 1 Smith			

Appendix	opendix 8 Reporting and Maintaining Records Detailed Audit Findings (Part 9)								
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary				
	in the Reporting Manual relating to water quality monitoring.	monitored by NSW Health.	in the Reporting Manual relating to water quality monitoring.		Street, Parramatta. Correspondence Register sighted (hard copy) - period of 1 December 2010 to 31 December 2010 viewed in detail. <b>Commentary:</b> To address issues of communication between Sydney Water and NSW Health, Sydney Water essentially restructured and created the Water Quality Team for which the Water Quality and Assurance Manager has responsibility. All correspondence between Sydney Water and NSW Health is recorded on a Correspondence Register (sighted) with one person from Sydney Water (from the Assurance Team) being the designated point of contact for NSW Health. All formal email communication from Sydney Water to NSW Health is sent to the individual officer and the Water Quality mailbox at NSW Health. Small requests for information are generally only sent to the specific officer although all communication is recorded in the Correspondence Register.				
9 (c) Audit	Sydney Water must maintain record systems that are sufficient to enable it to accurately report in accordance with clause 9(a).	Moderate Risk. Record systems must be reliable and current.	Maintenance of record systems that are sufficient to enable accurate reporting in accordance with clause 9(a).	Full	Evidence: Interview with relevant staff, 14/09/2011, at Sydney Water Offices, 1 Smith Street, Parramatta. Online Compliance Program (viewed live on 14/09/2011). Email from IPART to Sydney Water 8 February 2011 2:07 pm noting that IPART was comfortable for Sydney Water to provide a presentation on the 2010 audit recommendation (Ministerial Requirement MR1) as a satisfactory response to the requirement (hard copy). Validation of Water Infrastructure Design Methodology IPART Workshop 29 March 2011 (Powerpoint presentation relating to Ministerial Requirement from Operational Licence Audit 2009-2010) (hard copy) Agenda relating to above showing that the presentation was given at Sydney Water Head Office on 29 March 2011 between 10:30 am and 12:00 pm and that the following were in attendance: IPART, the auditor having made the recommendation, Sydney Water (hard copy). Minutes of the above meeting detailing that IPART and the auditor considered				

Appendix 8	dix 8 Reporting and Maintaining Records Detailed Audit Findings (Part 9)							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor Commentary			
					that the presentation fully met the Ministerial Requirements (hard copy). Manual relating to use of the Online Compliance Program (Online Compliance_Admin Functions_SS_080512) (viewed live 14/09/2011). Note that information residing within SWEMS and pertinent to this section, was audited as part of Clause 6.			
					Commentary:			
					To give effect to this clause, Sydney Water has created a table which details the requirements of the Operating Licence and the Reporting Manual – noting that the requirements of the new Operating Licence have now been mapped in this table. Assignment of responsibilities under the Operating Licence and the Reporting Manual is assigned by the Compliance Team to the relevant GM who in turn assigns someone in their team to manage the requirements and associated actions. The Online Compliance Program was viewed (including a document directory) live at the audit including a table relating to Ministerial Requirements from previous audits to show how they are dealt with, in particular, Ministerial Requirements from the previous audit (2009/2010) were viewed.			
					Requirements are placed into individual Folios of Progress which are reviewed on a 6-monthly basis. All folios have the same structure with a built in control loop for the monitoring and checking of each identified issue.			
					At a corporate level, the Board Audit and Risk Committee signs off on the Compliance Program. The last update of the Corporate Compliance Manual was 9 February 2011. A Compliance Exceptions Report (not viewed) is reported to the board on a quarterly basis.			
					Everyone in the corporation has access to the Online Compliance Program but only specified persons have the authority to make changes.			
					At the audit, the 'Mandatory Requirements under Sydney Water's Operating Licence' was viewed. The table included all of the Licence clauses with each table showing the primary and secondary responsibility contacts and links to Folios of Progress as a means of tracking actions. The Project Manager for Regulatory Affairs is responsible for checking the progress of actions – it is not			

Appendix 8	x 8 Reporting and Maintaining Records Detailed Audit Findings (Part 9)						
Clause	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11	Auditor Commentary		
And				Audit Grade			
Scope							
					carried out automatically at this stage.		
					Corrective actions and OFIs from previous audits were viewed (Clause 11 – old licence – relating to contractual management).		
					<b>OFI:</b> A separate document and records control system exists for the corporate area. While the current segmented document and records control system appears to be functional, it would be beneficial for Sydney Water to consider having an overarching document control system for the business. It is understood that a corporate-wide document control system is currently being considered.		
					<b>OFI:</b> The Project Manager Regulatory Affairs is the main hub for use and control of the Online Compliance Program. Having largely a sole person with this responsibility could present a risk for Sydney Water. While it is acknowledged that risk is mitigated somewhat by the creation of a manual for use of the Online Compliance Program by the Project Manager, the manual is currently not a controlled document (although it is accessible from the S drive) and should become so.		

# Appendix 9 Request for information and access Detailed Audit Findings (Part 10)

Appendix	Appendix 9 Request for information and access Detailed Audit Findings (Part 10)								
Clause	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11	Auditor Commentary				
And				Audit Grade					
Scope									
10.1	Request for information and access – IPART								
10.1 (a) Audit	Sydney Water must comply with any reasonable request by IPART for information relating to the performance by Sydney Water of its obligations under clause 9.	Low Risk Performance monitored by IPART.	Compliance with any reasonable request by IPART for information relating to the performance of obligations under clause 9.	Full	Evidence: Letter from SWC to IPART dated 25/8/2011 ( <i>Ltr SWC to IPART_OL 1 Sept reports 2010-11.pdf</i> ) Commentary: The letter shows that SWC has supplied its suite of annual compliance and performance reports as required under the 2010-2015 OL.				
10.1 (b) Audit	As part of its obligations under clause 10.1(a), Sydney Water must provide IPART with physical and electronic access to the records kept by Sydney Water that enable it to comply with clause 9.	Low Risk Performance monitored by IPART.	Providing IPART with physical and electronic access to the records kept that enable compliance with clause 9.	Full	Evidence sighted for Section 9 of the Operating Licence fulfils the requirements of these clauses.				
10.1 (c) Audit	Sydney Water must provide IPART with such information as IPART reasonably requires to enable it to conduct any reviews of the Licence or obligations under the Licence as may be required	Low Risk Performance monitored by IPART.	Providing IPART with such information as IPART reasonably requires relating to conduct any reviews of the Licence or obligations under	Full					

Appendix 9 Request for information and access Detailed Audit Findings (Part 10)								
Clause	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11	Auditor Commentary			
And				Audit Grade				
Scope								
	by the Minister.		the Licence.					
10.2	Request for information and access – NSW Health							
10.2 Audit	Sydney Water must comply with any request by NSW Health for information relating to water quality. The information provided under this clause must be in the manner and form specified by NSW Health.	Low Risk Performance monitored by NSW Health.	Compliance with any request by NSW Health for information relating to water quality, as specified by NSW Health.	Full	Need to be double-checked with Water Quality, but otherwise, it is fulfilled by the information above.			

# Appendix 10 Memoranda of Understanding Detailed Audit Findings (Part 11)

Appendix	dix 10 Memoranda of Understanding Detailed Audit Findings							
Clause And	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor comments at the audit meeting			
Scope								
11	Memoranda of Understanding							
11 (a) Audit	In accordance with the Act, Sydney Water must maintain a memorandum of understanding with each of the following: • the Water Administration Ministerial Corporation (WAMC); • NSW Health; and • DECCW, • for the term of the Licence.	Low Risk Requirement of Sydney Water Act and performance monitored by the regulatory agencies.	Maintain memoranda of understanding with the regulatory agencies mentioned in the obligation.	Full	<ul> <li>Evidence:</li> <li>Interview with relevant staff, 14/09/2011, at Sydney Water Offices, 1</li> <li>Smith Street, Parramatta.</li> <li>a. Memorandum of Understanding between Sydney Water Corporation and the Water Administration Ministerial Corporation June 2011.</li> <li>b. Folio of Progress Memorandum of Understanding with the Water Administration Ministerial Council Reporting Period ending 30 June 2011 (Memorandum of Understanding WAMC Folio 2010-11.pdf)</li> <li>c. Memorandum of Understanding between Sydney Water Corporation and Water Administration Ministerial Corporation February 2007 (Final 2007 WAMC MoU incl signature .pdf)</li> <li>d. Folio of Progress Memorandum of Understanding (MoU) with NSW Health Reporting Period ending 30 June 2011 (Memorandum of Understanding with NSW Health Folio 2010-11.pdf)</li> <li>e. Memorandum of Understanding between NSW Health and Sydney Water Corporation 15 February 2006 (hard copy)</li> <li>f. Memorandum of Understanding between NSW Health and Sydney Water Corporation Draft for review 31 May 2011 (hard copy)</li> <li>g. Checklist of Requirements – MoU between SWC and NSW Health October 2010 (hard copy)</li> </ul>			

Appendix	Appendix 10 Memoranda of Understanding Detailed Audit Findings							
Clause	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11	Auditor comments at the audit meeting			
And				Audit Grade				
Scope								
					<ul> <li>Folio of Progress Memorandum of Understanding (MoU) with the Department of Environment Climate Change and Water (DECCW) Reporting Period ending 30 June 2011</li> </ul>			
					<ul> <li>Memorandum of Understanding between Sydney Water Corporation and Office of Environment and Heritage (NSW) August 2011</li> </ul>			
					<ul> <li>Memorandum of Understanding between Sydney Water Corporation and Department of Environment and Conversation (NSW) June 2006</li> </ul>			
					Advertisement of review of the Memorandum of Understanding Between Sydney Water Corporation and the Office of Environment and Heritage Invitation for Public Comment and Draft Revised MoU (including check of posting on OEH website 9/9/2011)			
					Commentary:			
					<b>MoU – WAMC:</b> Two documents were sighted; a new MoU dated 1 June 2011 and a preceding MoU which was in force for some of the audit scope dated February 2007. Note that new MoU was released for public comment (advertisements noted from the Office of Water) for 30 days. With no comments being received, the MoU was signed by the parties 1 June 2011.			
					<b>MoU – DECCW:</b> Two documents were sighted – a draft MoU between Sydney Water and the Office of Environment and Heritage (August 2011 and a MoU between Sydney Water and the Department of Environment and Conservation dated June 2006 which is currently still in force until the draft MoU is executed. Advertisements for the consultation process for the draft MoU were sighted as released by the Office of Environment and Heritage.			
					<b>MoU – Health:</b> Two documents were sighted – these being a draft MoU for review dated 31 May 2011 and a MoU which is force for the audit scope dated 15 February 2006.			

Appendix	Appendix 10 Memoranda of Understanding Detailed Audit Findings							
Clause And Scope	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor comments at the audit meeting			
11 (b) Audit	<ul> <li>The purpose of a memorandum of understanding is to form the basis for co-operative relationships between the parties to the memorandum. In particular:</li> <li>the memorandum of understanding with NSW Health is to recognise the role of NSW Health in providing advice to the Government of NSW in relation to: <ol> <li>the management of the supply of Drinking Water to ensure it is safe to drink; and</li> <li>the management of the supply of Recycled Water in respect of its fitness for purpose and effects on health;</li> </ol> </li> <li>the memorandum of understanding with DECCW is to recognise DECCW as the environmental regulator of the State and to commit Sydney Water to environmental obligations; and</li> <li>the memorandum of understanding with the WAMC, is to recognise the role of WAMC in regulating water access, use and management and Sydney Water's right to use water vested in the WAMC.</li> </ul>	Low Risk Performance monitored by regulatory agencies and IPART.	The purpose of the memoranda of understanding is as required in the obligation.	Full	<ul> <li>Evidence: See above.</li> <li>Commentary:</li> <li>MoU – Health: The MoU 2006 states Health's role at Clause 8 and includes the requirement to liaise on matters relating not only to Drinking Water and 'Other Grades of Water' but also to issues associated with wastewater management. The draft MoU 2011 includes requirements to jointly consider health issues associated with Drinking Water, Recycled Water and Effluent Management (Clause 4.2) as well as Health's responsibilities at Clause 8 (noting there is now a responsibility on NSW Health to review and endorse Sydney Water's Recycled Water Quality Management Plans).</li> <li>OFI: While there is a responsibility on NSW Health at Clause 8.4 to provide advice on wastewater management activities, it is suggested that at Clause 4.2, wastewater and in particular, health issues related to biosolids, are formally recognised (not withstanding that ad hoc joint working parties may be established to investigate specific technical issues).</li> <li>MoU – DECCW: Requirements relating to this licence clause are largely covered by Clause 2.4, 2.5 and Clause 3 of MoU 2006.</li> <li>MoU – WAMC: The MoU 2011 clearly states that the WAMC is represented by the NSW Office of Water and that the Office of Water's functions are stated at Clause 3.2 of the MoU. As noted in evidence provided by Sydney Water, Sydney Water and WAMC work together as required on a range of issues and cooperate through bilateral discussions and in inter-agency forums, such as the Metropolitan Water CEOs. An operating protocol for the Western Sydney Recycled Water Initiative is an attachment to the MoU. Sydney Water has liaised with WAMC on the Greater Metropolitan Region Water Sharing Plans and on matters relating to the water management licence.</li> </ul>			

Appendix	Appendix 10 Memoranda of Understanding Detailed Audit Findings					
Clause	Operating Licence Obligation	Risk	Target for Full Compliance	2010/11 Audit Grade	Auditor comments at the audit meeting	
Scope				Addit Grude		
					<b>OFI:</b> Note that Attachment A in MoU 2011 (The Western Sydney Recycled Water Initiative: Operating Protocol) will have to be reviewed more frequently than the MoU in entirety to ensure that contact details and personnel remain current. Note that Section 9.2 of the Protocol requires at least annual review by the parties. However, it is advised that Sydney Water includes a requirement in its Folio of Progress to ensure that annual review of the Attachment will be undertaken and that within the 'Interpretation' section of the Folio, that Sydney Water states that annual review is only for the Protocol itself and not of the MoU in its entirety.	
11 (c) Context	Clause 11(a) does not limit the persons or regulatory agencies with whom Sydney Water may have a memorandum of understanding.				Sydney Water does not have other MoUs.	

# **Appendix 11 Sydney Water Response to Previous Audit Recommendations**

The following table sets out Sydney Water's responses to recommendations and suggested improvement opportunities contained in the 2009/10 Operational Audit. Note that the audit scope only included clauses from Part 3 (Water Quality); Part 4 (Infrastructure Performance); Part 9 (Managing Supply and Demand and Part 11 (Liability Issues, focus on water quality).

(Ref #)	Audit Recommendation - Details	Sydney Water response	Audit comment	Planned Completion Date
LICENCE P	PART 3 - WATER QUALITY – Key recommendations			
R11.1	Clause 11.1.1: In Schedule 10 it is noted that faecal coliforms are listed as a parameter however, while a value of '0' is given for the finished water quality, there is no indication of what '0' pertains to (is it CFU, MPN etc) or the volume. This issue needs to be clarified either within the revised contract or within the amending deeds.	Sydney Water notes that since assays that report MPN or CFU are acceptable, it is not necessary to specific the unit provided the target value of zero is specified. The current auditor agrees with the Sydney Water position – unless an assay method is specified it is not possible to specify the reporting unit. If the assay method is discretionary, a variety of possible units could be reported.	Adequately addressed.	
R11.2	Clause 11.1.1: While it is understood that the current mode of amending the contract is through amending deeds, a consolidation of these amendments in to a new contract should be initiated to coincide with the completion of current capital works at the Prospect Treatment Plant, currently estimated to be completed in 2012.	This item is in progress. The work has been completed for the Macarthur plant and for Prospect the process is commencing. This item will need to be completed for the SDP following its impending transfer.	Adequately addressed.	

(Ref #)	Audit Recommendation - Details	Sydney Water response	Audit comment	Planned Completion Date
WATER O	UALITY – Suggested Improvements			
SR 3.1	Clause 3.6.1: Correct the reference to Tables 10 and 11 in the SOP Recycled Water Quality Specifications for Treatment Operations WRHQ5186_R3 10/08/09 to Tables 11 and 12. Noting that the specifications' document is currently under review to accommodate the implementation of new guidelines.			
SR 3.2	In the catchment to tap risk assessment process, Sydney Water must ensure that where it is relying on other parties to effect control that it has its own controls in place to assure Sydney Water that those controls are being managed properly. For instance, catchment management is not under the control of Sydney Water but if not managed properly by the responsible party, could present a high treatment risk for Sydney Water. In such cases, a high priority needs to be placed on controls such as monitoring (e.g. shared SCADA data), review and instruments such as MoU and other agreements to ensure compliance with stated controls.	The BWSA is currently being revised and SW is renegotiating the BWSA. SW is pushing as hard as it can to use the BWSA to provide itself with assurances and indirect control over source water risks. It is noted that SW has raw water on line and grab sample testing and monitoring, the existing BWSA, JOG and SLG meetings with SCA, bimonthly Water Forum meetings with SCA and a combined CCR report. There is a separate IPART audit on the SCA controls	Adequately addressed. This item is being addressed to the maximum extent practicable by SW through the SCA BWSA revision.	
SR 11.1	Clause 11.1.1: Ensure that a standard operating procedure or checklist or other such formal document is in place to allow for Sydney Water to agree on what constitutes an acceptable auditor for the purposes of Clause 10.12(c) of the contract.	Sydney Water now requires the BOO operator to gain Sydney Water's endorsement of the selected auditor. Correspondence was sighted for the 2011 audit being a letter from the BOO plant to Ben Blayney of Sydney water.	Adequately addressed.	

(Ref #)	Audit Recommendation - Details	Sydney Water response	Audit comment	Planned Completion Date
SR 11.2	Clause 11.1.1: One of the issues arising where multiple entities are responsible for the provision of various points of the water supply chain is that of 'handover' or water quality 'responsibility delineation' points. The contractual review should also include the addition of a diagram within the contract to clearly elucidate where monitoring and water quality responsibility points exist.	The "SCA and SWC Boundaries and Monitoring Points" is a detailed summary of the interface points and responsibilities. The document includes an asset diagram and sketch plan for each interface point between SWC/SCA and the relevant BOO operators. However, the document is not yet formalised and is a little dated. The document is being updated and formalised as part of the revised BWSA.	Adequately addressed. This item is being addressed to the maximum extent practicable by SW through the SCA BWSA revision.	
	LICENCE PART 4 - INFRASTRUCTURE PERFORMANCE – Key Recommendations			
R4.1	Sydney Water should convene a workshop with IPART by 31 March 2011, to present information and assumptions demonstrating validation of water infrastructure design methodology and assumptions for a range of water supply zones, sufficient to enable IPART to determine the suitability of Sydney Water's approach.		Adequately addressed.	31 March 2011
IPART	Report to IPART prior to 30 March 2010 on its assessment of each of the other recommendations and opportunities for improvement, identified by the auditor in its audit report, and what action, if any, should be taken to address them.	AGREE – Assessment conducted and reported to IPART.		Completed March 2010
	INFRASTRUCTURE PERFORMANCE – Suggested Improvements			
	There were no suggested improvements			
	LICENCE PART 9 – Water Conservation & Demand Management – Key Recommendations			

(Ref #)	Audit Recommendation - Details	Sydney Water response	Audit comment	Planned Completion Date
	There were no key recommendations			
	LICENCE PART 9 – Water Conservation & Demand Management – Suggested Improvements			
	There were no suggested improvements			

# **Appendix 12 Historical Performance Comparison**

# Performance Comparison for period 2003/04 to 2010/11

We have reviewed Sydney Water's performance in meeting its Licence Obligations over the period 2003/04 to 2010/11. In considering how to most usefully present this data a number of issues were identified:

IPART employs a risk-based methodology to prepare the audit scope. This means that different Licence Parts and/or Clauses will be audited in any specific year. Consequently trends in performance over time against specific Parts or Clauses are difficult to analyse. Further, Licences are reviewed every five years. This process may involve the removal, addition or changes to licence parts or individual licence clauses. This further complicates any attempt to analyse longer term trends in performance.

While variations in auditing practice and reporting can vary between auditors, IPART and the agency provide some 'levelling' or consistency over time.

The reporting by auditors over the years also shows a fair deal of variety. In some cases compliance is rated only against Clauses, in other cases, compliance is rated for sub-clauses and on occasions dot points in Clauses. There is no ready means to adequately compare compliance reporting on a fine scale with that on a more course scale.

Given these issues, we felt that the best approach was to consider some aggregate measure of business performance. Simply, the audit reports were reviewed, all compliances were recorded and the results presented as percentages of compliance achieved across all audited items. The number of Key Recommendations made was also considered as a measure of performance.

In addition to the above Figure provided in the Executive Summary, the following two Figures are presented for information:



Figure A-1 SWC Aggregate Compliance against Licence – Alternative View

Figure A12-2 Sydney Water - Number of Recommendations made in any Licence Year



# Appendix 13 Audit Methodology

It was an IPART requirement that the conduct of the audit of the utility's compliance with the relevant Part, Section or Clause of its Licence, involved the following activities:

- a) conduct a **detailed examination** of those activities of the utility that are regulated by the Operating Licence, subject to IPART's risk-based audit scope, where applicable.
- b) assess the level of compliance achieved by the utility against each of the requirements of the Operating Licence, set out in IPART's risk-based audit scope, providing detailed supporting evidence for this assessment and reporting compliance according to IPART's established compliance scoring methodology.
- c) assess and report on progress by the utility in addressing any comments made by the relevant portfolio Minister pertaining to previous audits, providing supporting evidence for these assessments.
- d) for each section of the Operating Licence that is to be audited, identify factors (if any) that have affected the utility's performance for the audit period (1 July 2010 to 30 June 2011). This includes verifying the calculation of performance indicators associated with relevant requirements of the operating licences and undertaking an assessment of any underlying trends in performance arising from these indicators. Make recommendations to IPART on how the utility can improve its performance in the future, based on the audit assessment.
- e) provide a **formal briefing** to the Tribunal, if required, comprising an overview of the utility's overall performance against the requirements of the Operating Licence and the key findings of the audit.
- f) prepare a full report on the findings of the assignment, including a summary of the utility's overall performance against the audited obligations of the Operating Licence and detail of its compliance with each audited obligation of the Operating Licence.

The auditor is responsible for assessing and interpreting the audit requirements in the relevant Operating Licence and the Act and ensuring that the audit process satisfies all statutory requirements subject to the detailed audit scope.

IPART advertised the audit processes and sought submissions from the public. The auditor was required to take account of any public submissions received and the views of relevant regulators (Department of Environment, Climate Change and Water, NSW Health and the NSW Office of Water) and other stakeholders including environment, social welfare and public interest groups.

For efficiency purposes, IPART also included auditing of Sydney Water's National Water Initiative (NWI) reporting into the Request for Quote (RFQ) audit scope, as the indicators reported in that reporting framework overlap with (and are being progressively integrated with) Operating Licence compliance and performance reporting. The outcomes of the NWI audit are the subject of a separate report.

# Audit Methodology

The methodology adopted for this audit is described in the following paragraphs.

# **Audit Preparation**

To meet the specific requirements of IPART, the operational audit was undertaken adopting a methodology consistent with ISO 14011 'Guidelines for Environmental Auditing'. This guideline provides a systematic approach to defining the requirements of the audit, planning, interpreting Licence Conditions, collecting audit evidence, objectively assessing the evidence, and reporting in a clear and accurate manner. It also ensures that the audit has been conducted in accordance with an established and recognised audit protocol.

#### Draft Audit Plan

A draft audit plan was prepared to ensure that the audit requirements were met and this plan was confirmed with IPART and Sydney Water.

#### **Inception Meetings**

Following the preparation and confirmation of the audit plan, an inception meeting was held with IPART and Sydney Water. This meeting, which included Sydney Water representatives, IPART representatives and the auditors, was held on 14<sup>th</sup> September, 2011.

The primary objective of this latter meeting was to develop working relationships, mutual understandings and expectations relating to the requirements and process of the audit. The meetings also provided an opportunity for Sydney Water to present an overview of compliance and progress since the previous audit period.

#### Audit Questionnaires

Specific audit questionnaires were developed for all clauses to be audited within the scope of the risk-based approach adopted by IPART for 2010/11. These questionnaires sought to determine compliance with the Licence requirements, identify any factors that may have impacted on performance (and the likely magnitude of that impact) and the systems in place to deliver or pursue *'best appropriate practice'* performance.

Audit questionnaires were provided prior to the audit interviews, to allow Sydney Water the opportunity to prepare for the interview.

#### Provision of Preliminary Information and Draft Responses

It was agreed by IPART, Sydney Water and the auditors, that the audit questionnaires would indicate the evidence that might be required, and that Sydney Water would make every endeavour to provide this evidence in sufficient time to allow the auditors to inform themselves with respect to Sydney Water's performance prior to interview. This allowed for more effective targeting of issues or factors during the interview process. Given the time constraints for this year's audit, Sydney Water was only able to provide some of this information prior to interview and the rest were provided at interview.

# **Conduct of the Audit**

Audit protocols were agreed and confirmed between the auditors, IPART and Sydney Water at the Sydney Water inception meeting to ensure an open and efficient flow of information and to resolve any identified or potential audit issues.

#### Audit Interviews

Nominated auditors (see Fig 1.1) led interviews over 14 and 15 September 2011. The interviews permitted the auditors to explore factors or issues not readily addressed in the written response to the auditors' questionnaires, or in the evidence previously provided by Sydney Water. The provision of the written responses and evidence prior to the interviews maximised the benefit of the interview process by allowing the auditors to better target key factors and issues not fully or readily addressed in the provided information.

# **Appendix 14 Audit Scope**

# Risk-based audit scope for Sydney Water Corporation's Operational Audit in 2010/11

"Audit" indicates clause to be audited; "SC" indicates non-auditable clause, where a Statement of Compliance is required from Sydney Water; "NR" indicates there is no requirement for compliance in 2010/11

IPART requested that auditors should note any Tribunal directions shown as comments in the far right hand column.

Clause	Operating Licence Obligation	Scope	Comments
2.1	Drinking Water		
	<ol> <li>Sydney Water must manage Drinking Water quality to the satisfaction of NSW Health in accordance with the Australian Drinking Water Guidelines (unless NSW Health specifies otherwise).</li> <li>Sydney Water must prepare, to the satisfaction of NSW Health, a Five Year Drinking Water Quality Management Plan covering the entire five year term of the Licence. The Five Year Drinking Water Quality Management Plan must be in operation by 31 December 2010 and include strategies for the comprehensive management of the quality of Drinking Water in Sydney Water's water supply system in accordance with the Australian Drinking Water Guidelines (unless NSW Health specifies</li> </ol>	Audit	Audit is to consider the 2010 audit recommendation in respect to Sydney Water must have appropriate procedures to manage risks to water quality, when it is relying on other parties to effect control on the water quality.
	<ul> <li>otherwise).</li> <li>(3) The Five Year Drinking Water Quality Management Plan is to be revised for the period 1 July 2015 to 30 June 2020. Sydney Water must provide a draft revised Five Year Drinking Water Quality Management Plan to NSW Health by 31 December 2014.</li> </ul>		This clause does not apply until 2014 and is excluded from the audit scope.
	<ul> <li>(4) Sydney Water is to implement procedures and processes for the appropriate management of the Drinking Water supply system under its control in light of its knowledge of the entire Drinking Water supply system (from the source to the consumer). Sydney Water must have adequate systems and processes in place to manage Drinking Water quality taking into account planning and risk management and their implementation across the entire Drinking Water supply system.</li> <li>(5) Sydney Water must comply with the fluoridation plant operating targets set out in the Eluoridation</li> </ul>		
	<ul> <li>(6) Sydney Water must report on Drinking Water quality monitoring in the manner and form outlined in the Reporting Manual.</li> </ul>		

Clause	Operating Licence Obligation	Scope	Comments
2.2	Recycled Water (including stormwater)		
	Sydney Water must manage Recycled Water quality in accordance with:	Audit	
	<ol> <li>the Australian Guidelines for Water Recycling (unless NSW Health specifies otherwise) to the satisfaction of NSW Health; and/or</li> </ol>		
	(2) any other guidelines specified by NSW Health to the satisfaction of IPART.		
	(3) Sydney Water must report on Recycled Water quality monitoring in the manner and form outlined in the Reporting Manual.		
2.3	Changes to management of water quality		
	<ol> <li>Sydney Water must notify NSW Health of any proposed changes to its processes for:         <ul> <li>(a) managing; or</li> <li>(b) reporting to NSW Health in relation to; Drinking Water quality under clause 2.1 or Recycled Water quality under clause 2.2 where such changes may have a material impact on public health.</li> <li>(2) Sydney Water must obtain NSW Health's approval for any changes notified under clause 2.3(a) before implementing them.</li> </ul> </li> </ol>	Audit if circumstances have changed	
3.1.1	Managing Assets		
	Sydney Water must ensure that its Assets are managed consistently with the asset management framework described in clause 3.1.2.	NR	Separate audit as part of the OPEX CAPX review

Clause	Operating Licence Obligation	Scope	Comments
3.1.2	Asset management framework		
	Sydney Water's asset management framework must demonstrate:	NR	Separate audit as part of the OPEX CAPX review
	<ul> <li>(a) robust and transparent methodologies for determining and prioritising licensing and other regulatory requirements and current and future service levels as well as identifying the infrastructure needed to achieve those service levels and requirements:</li> </ul>		
	<ul> <li>(b) robust, transparent and consistent processes, practices and programs to ensure sustainable delivery of service levels and regulatory requirements, based on sound risk management, including:</li> </ul>		
	<ol> <li>asset inventory;</li> <li>asset planning incorporating both business and technical risk assessments;</li> </ol>		
	<ul><li>(3) maintenance of adequate records and robust and reliable data;</li></ul>		
	<ul> <li>(4) asset replacement, rehabilitation, augmentation, creation/acquisition and/or substitution (asset and non asset substitutions);</li> </ul>		
	<li>(5) management of service provision, including contracts;</li>		
	(6) monitoring and condition assessment;		
	(7) proactive and reactive maintenance;		
	(8) operations;		
	(9) training and resourcing;		
	<ul> <li>(10) contingency planning covering both</li> <li>emergency management and business</li> <li>continuity; and</li> </ul>		
	(11) asset rationalisation and disposal;		
	(C) robust and transparent decision making processes that balance acceptable risk with cost and service provision to achieve prudent, efficient and effective operating and capital investment:		
	<ul> <li>(d) an approach that achieves the lowest cost of service delivery through the effective life cycle management of the asset base; and</li> </ul>		
	(e) robust and transparent processes of review and continuous improvement in asset management.		
3.2	Notification of significant changes to asset management framework		
	Sydney Water must advise IPART of any significant changes to processes and methodologies established in accordance with clause 3.1.2 which may have a material impact on the asset management framework.	NR	Separate audit as part of the OPEX CAPX review

Clause	Operating Licence Obligation	Scope	Comments
3.3	System performance standards		
	<ul> <li>(a) For the purposes of this clause 3.3 (except in relation to Uncontrolled Sewerage Overflows under clause 3.3.3), each separately billed or separately occupied part of multiple occupancy Property is considered to be a separate Property.</li> </ul>	Context	Definition clause.
	(b) For the purposes of Uncontrolled Sewerage Overflows under clause 3.3.3, each multiple occupancy Property is counted as a single Property.		
	(C) In the case of any ambiguity in the definition or application of any system performance standards, IPART's interpretation or assessment of the system performance standards will prevail.		
3.3.1	Water Pressure Standard		
	<ul> <li>(a) Water Pressure Standard</li> <li>Sydney Water must ensure that no more than 6,000 Properties experience a Water Pressure Failure in a financial year in its Drinking Water supply system.</li> <li>(b) Water Pressure Failure <ul> <li>(1) A Property is taken to have experienced a Water Pressure Failure at each of the following times:</li> <li>(A) when a person notifies Sydney Water that the Property has experienced a Water Pressure Failure and that Water Pressure Failure is confirmed by Sydney Water; or</li> <li>(B) when Sydney Water's systems identify that the Property has experienced a Water Pressure Failure.</li> </ul> </li> </ul>	Audit	
	<ul> <li>(2) A Property will not be taken to have experienced a Water Pressure Failure only because of a short term operational problem (such as a main break) which is remedied within 4 days of its occurrence or from abnormal demand (such as demand during fire fighting).</li> <li>(3) Clause 3.3.1(b)(1) does not limit the circumstances in which a Property will have experienced a Water Pressure Failure.</li> </ul>		

Clause	Operating Licence Obligation	Scope	Comments
3.3.2	Water Continuity Standard		
	(a) Water Continuity Standard Sydney Water must ensure that:	Audit	
	<ul> <li>a. no more than 40,000 Properties experience an Unplanned Water Interruption exceeding 5 hours in a financial year; and</li> </ul>		
	<ul> <li>no more than 14,000 Properties experience</li> <li>3 or more Unplanned Water Interruptions of more than 1 hour duration in a financial year,</li> </ul>		
	in its Drinking Water supply system.		
	(b) Unplanned Water Interruption		
	<ol> <li>In determining whether a Property experiences an Unplanned Water Interruption a best estimate is to be applied from the best available data, taking account of water pressure data where that data is available.</li> </ol>		
	(2) A Property is taken to have experienced a separate Unplanned Water Interruption for each period of 5 hours or more that the Unplanned Water Interruption exists.		
	<ul> <li>(3) Clause 3.3.2(b)(2) does not limit the circumstances in which a Property will have experienced an Unplanned Water Interruption under clause 3.3.2(b)(1).</li> </ul>		
3.3.3	Sewage Overflow Standard		
	Sydney Water must ensure that:	Audit	
	<ul> <li>(a) no more than 14,000 Properties (other than Public Properties) experience an Uncontrolled Sewage Overflow in dry weather in a financial year; and</li> </ul>		
	(b) no more than 175 Properties (other than Public Properties) experience 3 or more Uncontrolled Sewage Overflows in dry weather in a financial year.		
3.4	Service quality and system performance indicators		
	(a) Sydney Water must maintain record systems that are sufficient to enable it to measure accurately its performance against the Service Quality and System Performance Indicators.	Audit	
	(b) In the case of any ambiguity in the definition or application of any indicators, IPART's interpretation or assessment of the indicators will prevail.		

Clause	Operating Licence Obligation	Scope	Comments
3.5	Response time for water main breaks		
	<ul> <li>(a) Sydney Water's response to water main breaks and leaks (in the trunk and reticulation components of Sydney Water's Drinking Water supply system between water treatment plants and a Property), as measured from the time Sydney Water receives notification of a break or leak to the time Sydney Water stops the loss of water, will be as follows: <ul> <li>(1) Priority 6 breaks/leaks</li> <li>90% of jobs within 3 hours</li> <li>(2) Priority 5 breaks/leaks</li> <li>90% of jobs within 6 hours</li> <li>(3) Priority 4 breaks/leaks</li> <li>90% of jobs within 5 days</li> </ul> </li> <li>(b) Categorisation of Priorities 4, 5 and 6 is set out in</li> </ul>	Audit	
	Schedule 3.		
3.6	Priority Sewage Program		
	<ul> <li>(a) Sydney Water must continue with the planning and delivery of the Priority Sewerage Program such that Wastewater services are provided to the requisite number of lots in the following areas by the dates specified below:</li> </ul>	Audit	
	<ul> <li>(1) Agnes Banks and Londonderry by 31 December 2012;</li> <li>(2) Classedia Ecompatic Basesh and Wilherforce</li> </ul>		
	<ul> <li>Glossodia, Freeman's Reach and Wilderforce by 31 December 2012;</li> <li>(2) William December 2012;</li> </ul>		
	(3) Yellow Rock and Hawkesbury Heights by 31 December 2012; and		
	<ul> <li>(4) Appin by 30 June 2015.</li> <li>(b) If either Sydney Water or a licensee under the Water Industry Competition Act 2006 provides Wastewater services to a significant development (as determined by the Minister) in an adjoining area to one of the following areas in the Priority Sewerage Program: <ul> <li>(1) Austral and West Hoxton;</li> </ul> </li> </ul>		
	(2) Wilton; or		
	(3) Menangle and Menangle Park, then Sydney Water must deliver the Priority Sewerage Program in that area such that Wastewater services are made available to Customers within 24 months of Wastewater services being available to service the significant development.		
	(c) Clause 3.6(b) does not apply where a licensee under the Water Industry Competition Act 2006 provides Wastewater services to the relevant area of the Priority Sewerage Program.		
	(d) Sydney Water must complete planning for, and begin construction on, the provision of Wastewater services to the requisite number of lots in the Cowan and Bargo areas of the Priority Sewerage Program by the end of the term of the Licence. The construction work to be commenced by the end of the term of the Licence must include the augmentation of the sewage treatment plant at Picton required to facilitate the implementation of		

Clause	Operating Licence Obligation	Scope	Comments
	<ul> <li>the Priority Sewerage Program in the Bargo area.</li> <li>(e) Should delays caused by consent authorities impair Sydney Water's ability to meet the timeframes set out in this clause 3.6, Sydney Water must write to the Minister to advise of the reasons for the delay.</li> </ul>		
	(f) Sydney Water must provide an annual report on its progress in implementing the Priority Sewerage Program to IPART in accordance with the Reporting Manual.		
4.1	Customer Contract		
	(a) Section 54 of the Act requires that the terms and conditions of a customer contract are set out in Sydney Water's operating licence. Sydney Water's customer contract is set out in Schedule 2 (Customer Contract).	Audit	Clauses (a) and (b) are interpretive clauses only.
	(b) The Customer Contract sets out the rights and obligations of Customers and Sydney Water in relation to the Services provided through systems required under the Licence. These rights and obligations are in addition to the rights and obligations conferred by the Act and any other law.		
	(c) A copy of the Customer Contract, and any variations to it must be posted on Sydney Water's website for downloading by any person free of charge and provided to Customers free of charge upon request.		
4.2.1	Explaining the Customer Contract		
	Sydney Water must prepare a pamphlet that:	Audit	
	<ul> <li>(a) provides a brief explanation of the Customer Contract;</li> </ul>		
	<ul> <li>(b) summarises the key rights and obligations of Customers under the Customer Contract;</li> </ul>		
	<ul> <li>(c) refers to the types of account relief available for Customers experiencing financial hardship; and</li> </ul>		
	<ul> <li>(d) contains a list of Sydney Water's contact numbers in its Area of Operations.</li> </ul>		
4.2.2	Explaining variation to Customer Contract		
	The pamphlet prepared under clause 4.2.1 must be updated when changes are made to the Customer Contract and must be disseminated by Sydney Water free of charge to:	Audit	
	<ul> <li>(a) Customers, at least once annually with their quarterly or other bills; and</li> </ul>		
4.2	(D) any other person on request.		
4.3	Consumers	A!!+	
	Contract relating to complaint handling and complaint resolution procedures are extended to Consumers as if the Consumers were a party to the relevant Customer Contract.	Audit	
4.4	Practices and procedures relating to customer hardship, debt, water flow restriction and disconnection for non payment		
	<ul> <li>Sydney Water must have in place and comply with procedures relating to customer hardship, debt, water flow restriction and disconnection. These</li> </ul>	Audit	

Clause	Operating Licence Obligation	Scope	Comments
	procedures must include:		
	<ol> <li>a customer hardship policy for residential Customers, that helps residential Customers in financial difficulty better manage their current and future bills;</li> </ol>		
	<ul> <li>a payment plan for residential Customers who are responsible for paying their bill and who are, in Sydney Water's opinion, experiencing financial difficulty;</li> </ul>		
	<ul> <li>(3) conditions for disconnection of supply or water flow restriction in accordance with the disconnection procedure set out in the Customer Contract; and</li> </ul>		
	<ul> <li>provisions for self-identification,</li> <li>identification by community welfare</li> <li>organisations and identification by Sydney</li> <li>Water of residential Customers experiencing</li> <li>financial difficulty.</li> </ul>		
	(b) Sydney Water must set out the procedures relating to customer hardship, debt, water flow restriction and disconnection referred to in clause 4.4(a) in the Customer Contract.		
	(C) Sydney Water must provide information on its procedures relating to customer hardship, debt, water flow restriction and disconnection free of charge to:		
	<ol> <li>residential Customers, at least once annually with their quarterly or other bills;</li> </ol>		
	<ul> <li>residential Customers who are identified as experiencing financial difficulty; and</li> </ul>		
	(3) any other person who requests it.		
	<ul> <li>(d) Sydney Water must publish its procedures relating to customer hardship, debt, water flow restriction and disconnection on its website.</li> </ul>		
	(e) Sydney Water must advise residential Customers of their rights, including any rights to have a complaint or dispute referred to the Energy and Water Ombudsman NSW for resolution.		
4.5.1	Customer Councils		
	<ul> <li>(a) In accordance with the Act, Sydney Water must have in place and regularly consult with a Customer Council to enable community involvement in issues relevant to the performance of Sydney Water's obligations under the Licence. Sydney Water may have one or more Customer Councils.</li> </ul>	Audit	
	<ul> <li>(b) Sydney Water must consult with the Customer Council, in accordance with the terms of the relevant Customer Council Charter, on:</li> </ul>		
	<ul> <li>the interests of Customers and Consumers of Sydney Water;</li> <li>(1)</li> </ul>		
	(2) the Customer Contract; and		
	<ul> <li>(3) such other key issues related to Sydney</li> <li>Water's planning and operations as Sydney</li> <li>Water may determine.</li> </ul>		
	(C) Sydney Water must appoint the members of a Customer Council, consistent with the Licence.		

Clause	Operating Licence Obligation	Scope	Comments
	<ul> <li>(d) At all times, the membership of a Customer Council must include a representative for the interests of at least each of the following: <ul> <li>(1) business and consumer groups;</li> <li>(2) low income households;</li> <li>(3) people living in rural and urban fringe areas;</li> <li>(4) residential consumers;</li> <li>(5) environmental groups;</li> <li>(6) local government; and</li> <li>(7) people from culturally and linguistically diverse backgrounds.</li> </ul> </li> <li>(e) Sydney Water must provide a Customer Council with information within its possession or under its control (other than information or documents over which Sydney Water or another person claims confidentiality or privilege) necessary to enable that Customer Council to discharge the tasks arcimed to it</li> </ul>		
45.2	assigned to it.		
4.3.2	(a) In consultation with members of each Customer Council, Sydney Water must maintain a customer council charter (Customer Council Charter) that addresses:	Audit	
	<ol> <li>the role of the Customer Council;</li> <li>selection criteria on how members will be drown from the community.</li> </ol>		
	<ul> <li>(3) how the Customer Council will operate;</li> <li>(4) induction processes for new members;</li> <li>(5) a description of the type of matters that will be referred to the Customer Council;</li> <li>(6) procedures for the conduct of Customer</li> </ul>		
	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;		
	<ul> <li>(/) communicating the outcome of the Customer Council's work to the public, including the publication of meeting agenda and minutes on Sydney Water's website;</li> </ul>		
	<ul> <li>(8) procedures for tracking issues raised and ensuring appropriate follow-up of those issues; and</li> </ul>		
	(9) funding and resourcing of the Customer Council by Sydney Water including sitting fees and expenses for members.		
	(b) Either Sydney Water or the Customer Council may 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.		
5.1	Internal Dispute Resolution Process		
	(a) Sydney Water must establish and maintain internal complaint handling procedures for receiving, responding to and resolving Complaints by Customers and Consumers against Sydney Water.	Audit	

Clause	Operating Licence Obligation	Scope	Comments
	(b) The internal complaints handling procedures of Sydney Water must be based on the Australian Standard AS/ISO 10002: 2004 MOD Customer Satisfaction – Guidelines for Complaint Handling, as amended or replaced from time to time.		
	(C) Sydney Water must make available to Customers and Consumers information concerning its internal complaints handling procedures which explains how to make a Complaint and how the complaint handling procedure works.		
	(d) Sydney Water must provide information of the nature described in clause 5.1(c) to Customers through their quarterly, or other, bills at least once annually.		
5.2	External Dispute Resolution Scheme		
	(a) Sydney Water must establish or be a member of an industry based dispute resolution scheme for the resolution by a dispute resolution body of disputes between Sydney Water and its Customers and between Sydney Water and Consumers.	Audit	
	(b) Any industry based dispute resolution scheme so established by Sydney Water is subject to the Minister's approval.		
	(C) Sydney Water must:		
	<ul> <li>prepare a pamphlet that explains how the dispute resolution scheme operates and how it can be accessed; and</li> </ul>		
	(2) provide that pamphlet to Customers through their quarterly or other bills, at least once annually.		
6.1	Environment management		
	<ul> <li>(a) Sydney Water must maintain an environmental management system certified to AS/NZS ISO 14001:2004 (as updated from time to time) to manage environmental risk of its business and service delivery.</li> </ul>	Audit	
	<ul> <li>(b) Sydney Water must prepare a Five Year Environment Plan in accordance with the environmental management system in clause 6.1(a) by 30 September 2010. The Five Year Environment Plan must:</li> <li>(1) include Sydney Water's environmental objectives:</li> </ul>		
	<ul> <li>(2) contain details of Sydney Water's program to meet the environmental objectives including targets and timetables;</li> </ul>		
	<ul> <li>endorse the principles of ecologically sustainable development;</li> </ul>		
	<ul> <li>be integrated into Sydney Water's business plans; and</li> </ul>		
	<ul> <li>(b) be posted on Sydney Water's website for downloading by any person free of charge. A copy of the plan must be provided to any member of the public free of charge upon request.</li> </ul>		
	(C) Sydney Water must complete an annual progress report in accordance with the Reporting Manual,		

Clause	Operating Licence Obligation	Scope	Comments
	<ul> <li>outlining details of Sydney Water's progress with the environmental objectives, targets and timetable.</li> <li>(d) Each year Sydney Water must review the Five Year Environment Plan by consulting with DECCW and peak environmental non-governmental organisations to determine whether any changes to the Five Year Environment Plan are required in the subsequent year and the nature of those amendments.</li> </ul>		
6.2	Environment indicators		
	<ul> <li>Sydney Water must:</li> <li>(a) monitor, record and compile data on the Environmental Performance Indicators; and</li> <li>(b) report on the Environmental Performance Indicators,</li> <li>in accordance with its obligations under the Reporting</li> </ul>	Audit	
	Manual.		
7.1	Water Usage Level		
	<ul> <li>(a) Sydney Water must reduce the quantity of Drinking Water 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) by 30 June 2011.</li> <li>(b) Thereafter, Sydney Water must continue to maintain the Water Usage Level for the remainder</li> </ul>	Audit	Clauses (c), (d) & (e) are excluded from the audit – not due until 2011-12.
	of the term of the Licence, to be measured at 30 June each year.		
	(C) In calculating water usage for the purposes 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.		
	(d) If Sydney Water fails to meet the Water Usage Level in a particular year, Sydney Water must demonstrate, to the satisfaction of IPART, that it would not have been reasonable to meet the Water Usage Level in that year.		
	(e) Sydney Water must undertake a review of the water usage level as part of the end of term review of this Licence.		
7.2	Water Leakage		
	<ul> <li>(a) Sydney Water must ensure that the level of water leakage from its Drinking Water supply system (the Water Leakage Level) does not exceed 105 megalitres per day.</li> <li>(b) When calculating the Water Leakage Level each year, Sydney Water must use the assumptions and methodology approved by IPART.</li> <li>(c) Sydney Water must complete a review by 31 December 2011 to determine the economic Water Leakage Level and submit a report on this review to IPART. The review must be conducted in a manner acceptable to IPART.</li> <li>(d) Following submission of the report from Sydney Water under clause 7.2(c), IPART must provide a recommendation to the Minister as to the</li> </ul>	Audit	

Clause	Operating Licence Obligation	Scope	Comments
	(e) Following review of the report submitted to IPART under clause 7.2(c) and consideration of IPART's recommendation under clause 7.2(d), the Minister may adjust the Water Leakage Level.		
7.3	Water efficiency programs		
	<ul> <li>(a) Sydney Water must undertake and promote water efficiency programs.</li> <li>(b) Sydney Water must give due consideration to water efficiency and other water conservation measures as part of planning the future provision of its Services, including addressing water leakage.</li> </ul>	Audit	
7.4	Water recycling program (including stormwater)		
	(a) Sydney Water must promote, foster and encourage the production and use of Recycled Water in the Area of Operations.	Audit	
	<ul> <li>(b) Sydney Water must: <ul> <li>(1) meet any target relating to the production and/or use of Recycled Water set by the Minister from time to time consistent with the objectives of the Metropolitan Water Plan; and</li> <li>(2) implement any particular Recycled Water schemes indicated by the Minister so as to meet any target in clause 7.4(b)(1) above.</li> </ul> </li> <li>(C) Sydney Water is not required to undertake any Recycled Water scheme where it is not financially viable to do so.</li> </ul>		

Clause	Operating Licence Obligation	Scope	Comments
7.5	Water Conservation Strategy Document and annual report		
	<ul> <li>(a) Sydney Water must prepare and submit to IPART and the Minister by 31 December 2010 a Five Year Water Conservation Strategy Document covering the term of the Licence. The Five Year Water Conservation Strategy Document must include details of: <ul> <li>(1) strategies relating to water leakage;</li> <li>(2) strategies relating to Recycled Water;</li> <li>(3) strategies relating to water efficiency;</li> <li>(4) how the water conservation strategies outlined in paragraphs (a)(1) – (a)(3) above contribute to the objectives and targets outlined in the Metropolitan Water Plan.</li> </ul> </li> <li>(b) The Five Year Water Conservation Strategy Document must provide an analysis of current and future programs and projects being undertaken, and expected to be undertaken, by Sydney Water. In particular, the Five Year Water Conservation Strategy Document must outline Sydney Water's water conservation objectives, targets and timetable for the entire term of the Licence.</li> <li>(c) Sydney Water must provide an annual report on its progress in implementing its water conservation strategies in accordance with the Reporting Manual. The annual report must include an explanation of how work done for the purpose of implementing the water conservation strategies undertaken during the year contribute to the objectives and targets outlined in the Metropolitan Water Plan.</li> <li>(d) The following documents must be placed on Sydney Water's website: <ul> <li>(1) the annual report on Sydney Water's progress in implementing its water conservation strategies in accordance strategies related to the objectives and targets outlined in the Metropolitan Water Plan.</li> </ul> </li> </ul>	Audit	
	Document.		
9	Reporting and maintaining records	a 11/	
	<ul> <li>(a) Sydney Water must comply with its reporting obligations set out in the Reporting Manual and must report to IPART in accordance with the Reporting Manual.</li> <li>(b) Sydney Water must provide to NSW Health a copy of any report referred to in the Reporting Manual relating to water quality monitoring.</li> <li>(c) Sydney Water must maintain record systems that are sufficient to enable it to accurately report in</li> </ul>	Audit	
10.1	accordance with clause 9(a).		
10.1	<ul> <li>(a) Sydney Water must comply with any reasonable request by IPART for information relating to the performance by Sydney Water of its obligations under clause 9.</li> <li>(b) As part of its obligations under clause 10.1(c)</li> </ul>	Audit	

Clause	Operating Licence Obligation	Scope	Comments			
	Sydney Water must provide IPART with physical and electronic access to the records kept by Sydney Water that enable it to comply with clause 9.					
	(C) Sydney Water must provide IPART with such information as IPART reasonably requires to enable it to conduct any reviews of the Licence or					
	obligations under the Licence as may be required by the Minister.					
10.2	Request for information and access – NSW Health					
	Sydney Water must comply with any request by NSW Health for information relating to water quality. The information provided under this clause must be in the manner and form specified by NSW Health.	Audit				
11	Memoranda of Understanding					
	<ul> <li>(b) In accordance with the Act, Sydney Water must maintain a memorandum of understanding with each of the following:</li> <li>(1) the Water Administration Ministerial Corporation (WAMC);</li> <li>(2) NSW Health: and</li> </ul>	Audit				
	(3) DECCW,					
	for the term of the Licence.					
	(a) The purpose of a memorandum of understanding is to form the basis for co-operative relationships between the parties to the memorandum. In particular:					
	<ul> <li>the memorandum of understanding with</li> <li>NSW Health is to recognise the role of NSW</li> <li>Health in providing advice to the</li> <li>Government of NSW in relation to:</li> </ul>					
	<ul> <li>the management of the supply of Drinking Water to ensure it is safe to drink; and</li> </ul>					
	<ul> <li>(B) the management of the supply of Recycled Water in respect of its fitness for purpose and effects on health;</li> </ul>					
	(2) the memorandum of understanding with DECCW is to recognise DECCW as the environmental regulator of the State and to commit Sydney Water to environmental obligations; and					
	(3) the memorandum of understanding with the WAMC, is to recognise the role of WAMC in regulating water access, use and management and Sydney Water's right to use water vested in the WAMC.					
	(b) Clause 11(a) does not limit the persons or regulatory agencies with whom Sydney Water may have a memorandum of understanding.					
12	End of term review of Licence					
	(b) Sydney Water must, on the direction of the Minister, make available to the public on request and for downloading from its website, and free of charge, the report prepared by the Licence Reviewer at the conclusion of the review.	NR				
Minister's rec	uirements	from	2009/10	) op	erational	audit
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	Requirement	Scope	Comments
MR1	Validation of water infrastructure design methodology Sydney Water to present a report to IPART before 31 March 2011 which outlines information and assumptions that demonstrate the validation of water infrastructure design methodology and assumptions for a range of water supply zones.	Audit	
	The information provided should be sufficient to enable a determination of the suitability of Sydney Water's approach.		

A Audit report – Operating licence audit

B Audit report – Asset management audit

B Audit report – Asset management audit

# WS Atkins International Ltd

in association with

### Cardno

# **Final Report to IPART**

Audit of Asset Management Obligations 2010/11– Sydney Water Corporation

November 2011

**Plan Design Enable** 

### Independent Pricing and Regulatory Tribunal Report on 2010/11 Audit of Asset Management Obligations – Sydney Water Corporation

### **Final Report**

### November 2011

#### Notice

This document and its contents have been prepared and are intended solely for the *Independent Pricing and Regulatory Tribunal of New South Wales (IPART)*'s information and use in relation to Sydney Water Corporation: *Audit of Asset Management Obligation*.

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## Abbreviations

Term	Definition	
ADAC	Asset Design As Constructed	
ADWG	Australian Drinking Water Guidelines (2004), National Health and Medical Research Council and Agriculture and Resource Management Council	
ANZECC	Australia and New Zealand Environment and Conservation Council	
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand	
ASAE	Australian Standard on Assurance Engagements	
BASIX	Building Sustainability Index	
BMIS	Business Management Information System	
DMS	Demand Management System	
ELL	Economic Level of leakage	
EMS	Environmental Management System	
ESD	Ecologically Sustainable Development	
EWON	Energy and Water Ombudsman NSW	
FRM	Field Resource Management	
GIS	Geographical Information System	
HACCP	Hazard Analysis and Critical Control Points	
IICATS	Integrated Instrumentation Control and Telemetry System	
ILI	Infrastructure Leakage Index	
IPART	Independent Pricing and Regulatory Tribunal (NSW)	
ISO	International Organisation for Standardisation	
IWA	International Water Association	
LCD	Litres per capita per day water consumption	
KPI	Key Performance Indicator	
MCA	Multi-Criteria Analysis	
MOU	Memorandum of Understanding	
NATA	National Analytical Testing Authority	
NHMRC	National Health and Medical Research Council	
NSW Health	NSW Department of Health	
NWI	National Water Initiative	
PAMS	Product and Asset Management System	
R&D	Research & Development	
RWQMP	Recycled Water Quality Management Plan	
SCA	Sydney Catchment Authority	
SOP	Standing Operating Procedure	
STP	Sewage Treatment Plant	

Term	Definition
SWC	Sydney Water Corporation
SWIM	Sydney Water Information Management System
UKWIR	United Kingdom Water Industry Research
WAMC	Water Administration Ministerial Corporation
WELS	Water Efficiency Labelling Standards
WES	Water Efficiency Standards
WERF	Water Environment Research Foundation
WSAA	Water Services Association of Australia

# Glossary/Definitions

	General Terms and Definitions
Term	Meaning
Act	Sydney Water Act, 1994
Area of Operations	As specified in section 10(1) of the Act and described in Part 10 of the Operating Licence.
Audit period	1 July 2010 to 30 June 2011
Auditor	Atkins in association with Cardno
Commencement Date (of operating licence)	1 July 2010
End of Term Review	A review of the Operating Licence is to be undertaken on or about 1 January 2014.
Function	Means a power, authority or duty.
Minister	The Minister responsible for administering the provisions of the Sydney Water Act 1994.
Operating Licence	The Licence between 1 July 2010 and 30 June 2015.

# **Compliance Table Assessment**

Term	Meaning
Grading of Compliance	The following ratings are used to grade achievement of compliance with a Licence condition.
Full compliance	All requirements of the condition have been met.
High compliance	Most requirements of the condition have been met with some minor technical failures or breaches.
Moderate compliance	The major requirements of the condition have been met.
Low compliance	Key requirements of the condition have not been met but minor achievements regarding compliance have been demonstrated.
Non compliance	The requirements of the condition have not been met.
Insufficient information	Relevant, suitable or adequate information to make an objective determination regarding compliance was not available to the auditor.
No requirement	The requirement to comply with this condition does not occur within the audit period or there is no requirement for Sydney Water Corporation to meet, such as a definition, a requirement placed upon another agency or the requirement was met in an earlier audit period.



## **Executive Summary**

Atkins, in association with Cardno, undertook a detailed assessment and interview of Sydney Water Corporation's (Sydney Water) representatives for a number of operating licence clauses relating to asset management obligations.

Sydney Water has managed its resources to achieve full compliance with the Clause 3.1 Asset Management Obligation on the Operating Licence for the period 2010-11.

#### **Summary of Key Findings**

Sydney Water has achieved full compliance in relation to its asset management obligations. The audit found that Sydney Water's asset management practices were approaching best practice in many areas. Sydney Water's asset management practices were supported by well developed systems and processes which enabled informed decision making. Sydney Water demonstrated processes to achieve continuous improvement in asset management.

#### **Summary of Key Recommendations**

There are no key recommendations.



## 1. Introduction

### 1.1 Background

Atkins, in association with Cardno (Atkins/Cardno), was engaged by the Independent Pricing and Regulatory Tribunal (IPART) to undertake the Audit of Asset Management Obligations in the Sydney Water Corporation's 2010-2015 Operating Licence. This work has been carried out in parallel with the review of Sydney Water's operating and capital expenditure. The views expressed in this report relate solely to compliance with the Operating Licence and should not be considered as implying any level of efficiency in the implementation of the asset management processes.

Sydney Water Corporation (Sydney Water) is a State Owned Corporation, wholly owned by the NSW Government. The roles and responsibilities of Sydney Water derive from the *Sydney Water Act, 1994* (the Act) and the Operating Licence issued pursuant to Part 5 of the Act. In accordance with the Act, the NSW Government granted the first Operating Licence to Sydney Water in 1995. Sydney Water is currently operating under its fourth Operating Licence, effective 1 July 2010 to 30 June 2015.

Throughout its area of operations, being Sydney, the Blue Mountains and Illawarra regions (as shown in Figure 1-1), Sydney Water provides services to a population of approximately 4.6 million. Schematic representations of the major water and sewerage infrastructure, under the control of Sydney Water are shown in Figure 1-2 and Figure 1-3, respectively.

### 1.2 Operating Licence

The asset management obligations of Sydney Water were assessed against the requirements of its Operating Licence (2010-2015). A copy of the Licence is available from Sydney Water's website.

http://www.sydneywater.com.au/Publications/LegislationActs/OperatingLicence.pdf

#### 1.3 Audit Scope

The audit scope covers the following clauses in Sydney Water's Operating Licence under its asset management obligations:

3.1.1 Managing assets

3.1.2 Asset management framework.

### 1.4 Summary of Compliance

In general, Atkins/Cardno found that Sydney Water performed well against the audited clauses of the Operating Licence. A summary of compliance is presented in Table 1-1.

Licence Clause	Compliance
3.1 Asset Management Obligation	
3.1.1 Managing assets	Full compliance
3.1.2 Asset management framework	Full compliance

 Table 1-1
 Summary of Compliance



Figure 1-1 Sydney Water Corporation's Area of Operations



Sydney Water Corporation's Water Infrastructure



Figure 1-3 Sydney Water Corporation's Sewerage Infrastructure



# 2. The Approach

### 2.1 The Approach

To ensure that the Audit was conducted in accordance with an established and recognised audit protocol, a systematic approach was taken to defining the requirements of the audit, planning, interpreting Licence conditions, collecting audit evidence, objectively assessing the evidence, and reporting in a clear and accurate manner. This methodology was consistent with IPART's *Audit Guideline, Water Licence Audits, Sept 2009* and *ASAE 3000* Assurance *Engagements Other than Audits or Reviews of Historical Financial Information.* 

#### 2.2 Audit Plan

To ensure that the audit requirements outlined in the Operating Licence and the brief were addressed, the scope of the audit was confirmed with IPART at an inception meeting and a draft audit plan revised as a result of IPART feedback. The draft audit plan was forwarded to Sydney Water and the schedule modified to meet Sydney Water and IPART staff availability.

#### 2.3 Documentation

Sydney Water provided relevant documentation for review by the auditors.

#### 2.4 Audit Questionnaires

An audit questionnaire was developed for all requirements within the scope of the audit. This questionnaire was designed to establish substantive compliance with the Licence requirements as well as to identify factors that have, or may have, an impact on performance.

The audit questionnaire also assessed the underlying procedures that Sydney Water has in place relevant to the requirements and the application of these procedures by Sydney Water. This was designed to verify that the underlying management processes within the organisation are sound and give confidence that work is carried out systematically and in accordance with internal procedures.

The Audit questionnaire and information request was provided to Sydney Water on the 8<sup>th</sup> August to allow Sydney Water the opportunity to prepare for the interviews and collate the necessary documentary evidence.

### 2.5 Conduct of the Audit

To ensure a positive relationship, audit protocols were established at the inception meeting between the auditor and Sydney Water representatives. The protocols were designed to ensure efficient and transparent information transfer and foster an open and professional working relationship between all parties.

Both Sydney Water and the auditor adhered to the agreed protocols.

#### 2.6 Audit Interviews

Specialist auditors conducted interviews between the 20<sup>th</sup> and 22<sup>nd</sup> September 2011. The interviews were generally guided, but not limited, by the pre-prepared questionnaires and Sydney Water was provided the opportunity to present evidence towards demonstrating compliance with the Licence requirements.

IPART representatives attended the interviews as observers.

Some requests for additional information and clarification were submitted in the weeks following the interview.

### 2.7 Audit Team

The audit team consisted of specialist auditors. The audit team structure is shown in Figure 2-1.



Figure 2-1 Audit Team

## 3. Audit Findings

### 3.1 Summary of Requirements

Part 3.1 of the *Operating Licence* outlines Sydney Water's obligations in relation to asset management. Clause 3.1.1 requires Sydney Water to implement the asset management framework while clause 3.1.2 requires Sydney Water to develop an asset management framework.

#### 3.2 Compliance

Atkins/Cardno determined that Sydney Water demonstrated **Full Compliance** in relation to clauses 3.1.1 and 3.1.2.

#### 3.3 Discussion

We found that asset management practices, supporting systems and documentation within Sydney Water were well developed, robust and mature. These practices had been refined over a number of years and Sydney Water indicated that these would continue to be refined as the organisation sought to further improve its performance.

Sydney Water was able to provide evidence of its asset management framework and its implementation. This evidence included documentation such as:

- Asset Management Framework
- Asset Management Plans for all asset classes
- Examples of documented processes and procedures relating to planning, procurement, design, operations, maintenance, renewal and risk management.

Documentation review was supplemented by:

- Presentations from relevant managers and staff followed by responses to queries from auditors; and
- Demonstrations of systems such as Maximo, IICATS and Hydra (GIS).

Sydney Water demonstrated a consistent and highly developed understanding of asset management and its role in supporting sustainable delivery of services to customers and the achievement of the business' objectives.

We noted that Sydney Water was the leading water utility in six of the eight elements of the WSAA Asset Management Process Benchmarking in 2008. It was close to being leader in the remaining two elements.

While Sydney Water was able to demonstrate a number of commendable asset management practices, the following were considered notable by the audit team:

- Use of decision frameworks to state investment criteria for capital works and guide engineers through the assessment of capital works needs;
- Use of economic benefit-cost justification for renewals investments for some asset types;

- Development of decision tools around issues such as condition assessment strategies for large diameter critical water mains and best practice approaches for managing the odour and corrosion impacts of hydrogen sulphide in sewers;
- The level of development of knowledge management processes supporting informed decision making as evidenced by:
  - The development of decision frameworks that have captured tacit knowledge which facilitates logical, consistent decision making relating to asset management;
  - Continuing development of critical asset management information systems such as Maximo and Hydra (GIS);
  - Investment in business intelligence software to analyse data from a range of databases to gain a greater understanding of asset performance leading to potential cost savings and better management of risks;
  - Monitoring and monthly reporting of asset performance, identification of high failure assets and implementation of corrective action;
  - The development of asset management plans for all asset classes which document current status, challenges/ issues, financial statistics and projections, capital and operational strategies to achieve the business objectives;
  - Providing field staff with feedback on facility asset performance through the Waterscape module on the intranet.
  - Initiation of an options library to store information on options considered and tools used in options selection for planning studies.
- The existence of a robust, consistent risk management framework with risk and control responsibilities clearly assigned and communicated. Contingency planning was well documented, with business continuity plans existing for all critical processes and incident responses maintained, regularly exercised and reported. Risk management was observed to be a key foundation in the decision making processes.
- A demonstrated commitment to continuous improvement by the organisation as demonstrated by, for example:
  - Asset management plans which included gap analyses and strategies/ actions to improve performance. The plans also documented incident learnings and corrective actions;
  - The identification and implementation of additional controls to achieve target residual risk levels;
  - Active involvement with industry associations such as WSAA, WERF and UKWIR as well as research organisations;
  - Organisational re-structuring such as the Operations and Maintenance partnerships to achieve efficiencies.

The robust use of data and evidence based decision making was a common theme in many of Sydney Water's investment decision practices. Examples included the use of actual flow data and / or customer databases to inform the timing of capital works investment.



### 3.4 Recommendations

There are no key recommendations.

Clause	Requirements	Risk	Target for Compliance	Comments
3.1	Asset Management Obligation			
3.1.1	Sydney Water must ensure that its assets are managed consistently with the asset management framework described in clause 3.1.2.	High risk. Failure to implement the framework will impact on service levels and increase costs to customers	Evidence that Sydney Water is implementing its asset management framework	Full complianceAll requirements of the condition have been met.We observed that Sydney Water was implementing the processes and systems outlined in its asset management framework. A rigorous process exists for monitoring service levels, asset performance, achievement of actions and targets. Relevant managers are made accountable for risk controls and business cases
3.1.2	Sydney Water's asset management framework must demonstrate:			Full complianceAll requirements of the condition have been met.
	a) Robust and transparent methodologies from determining and prioritising licensing and other regulatory requirements and current and future service levels as well as identifying the infrastructure needed to achieve those service levels and requirements;	High risk. Non-compliance may result in ineffective or inefficient allocation of resources thus contributing to increased costs	Evidence exists that robust and transparent methodologies exist	Sydney Water has an established integrated corporate planning process in place. This is supported by a range of plans and decision tools. Sydney Water has developed a suite of Decision Frameworks that ensures a logical and consistent decision making process within Sydney Water
	b) Robust, transparent and consistent processes, practices and programs to ensure sustainable delivery of service	High risk: Non-compliance will result in unsustainable service delivery causing a reduction in service levels	Evidence that robust, transparent and consistent	Sydney Water uses a risk based approach to decision making with priorities being set based on risk ratings. The supporting documentation is comprehensive.

Table 3-1	Compliance Assessment
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Clause	Requirements	Risk	Target for Compliance	Comments
	levels and regulatory requirements, based on sound risk management including:	requiring increased charges to customers to re-establish acceptable service levels	processes, practices and programs exists programs exist	
	i. Asset inventory;	High risk: An inadequate asset inventory will result in inefficient business operations, duplication of effort, increased costs and poor response to customer requests		Sydney Water has well developed systems for recording asset attributes, location and criticality. The primary systems are Maximo (facility assets) and Hydra (GIS) for linear assets (pipes and fittings). These systems are linked. A financial asset register also exists. Processes exist to maintain the currency and reliability of the data stored.
	<li>Asset planning incorporating both business and technical risk assessments;</li>	High risk. Inadequate consideration of risk could lead to sub-optimal asset investment, increased costs and risk exposure		Sydney Water has well developed processes to identify investment needs for growth and service level improvements and identify and assess options, and assess the timing of investment requirements.
	iii. Maintenance of adequate records and robust and reliable data;	High risk. Without access to reliable, accurate and timely information Sydney Water is unlikely to make optimal asset management decisions resulting in additional costs to customers and reduced service levels		The primary data sources include IICATS (operational data), Maximo (maintenance management) and Hydra (GIS). Asset management procedures are stored in PAMS. Controlled documents are stored in BIMS while records and uncontrolled documents are stored in SWIM. Sydney Water has invested in Business Object a business intelligence software that allows staff to better analyse data from a range of sources within the company.

Clause	Requirements	Risk	Target for Compliance	Comments
	<ul> <li>iv. Asset replacement, rehabilitation, augmentation, creation/acquisition and/or substitution (asset and non asset substitutions);</li> </ul>	High risk. Non-compliance will result in either ineffective asset investment or excessive asset failures and reduced service levels		Investment in renewals is linked to condition and performance criteria, risk and service level expectations. Direct observation or assessment of the asset condition is made to optimise the timing of renewals investment where feasible and cost effective. Sydney Water is developing the use of economic cost benefit methodologies for renewals requirement assessments.
	v. Management of service provision, including contracts;	High risk. Non-compliance will result in excessive costs of services/ infrastructure provided to Sydney Water		An extensive review of Alliance procurement methodologies and costs is provided in section 5. Otherwise, Sydney Water uses good practice for the management of service provision including the use of a Capital Projects Delivery Management System (which independent audits have found to be mature and comprehensive) and competitive tendering and strategy reviews for purchases of major items such as chemicals and energy.
	vi. Monitoring and condition assessment	High risk. Failure to understand the condition and performance of assets could lead to premature or delayed asset investment resulting in increased costs and/or reduced service levels		A risk-based approach is taken to asset monitoring and condition assessment. Condition assessment strategies and condition grading methodologies are well documented. A pro-active approach is taken towards high criticality assets. A wide range of condition assessment methodologies are adopted. Sydney Water is now able to analyse the operational performance of assets and identify potential problems and intervene ahead of any failure. A system of failure history and reporting is in place which enables problem assets to be

Clause	Requirements	Risk	Target for Compliance	Comments
				identified and action taken. The strategies adopted are considered to be robust and comprehensive.
	vii. Proactive and reactive maintenance	High risk. Inadequate investment in maintenance could result in premature asset failure, reduced asset availability, reduced service levels and increased costs		Maintenance strategies are based on the required performance/ condition requirements to meet asset availability, reliability, criticality and risk criteria. Maintenance is managed through Maximo and procedures are well documented. The performance of assets is closely monitored and appropriate intervention actions implemented. The maintenance strategies were considered to be well developed, implemented and monitored. Processes existed for optimising maintenance to balance risk of failure with customer service levels.
	viii. Operations	High. Non-compliance could lead to a reduction in service levels and excessive costs		The water and sewerage networks are controlled through the IICATS system with individual plants controlled through SCADA. The IICATS system is a sophisticated telemetry system with in-built and off-line analysis tools to assist in optimising system operation. Operational procedures are well documented
	ix. Training and resourcing	High. Non-compliance could lead to a reduction in service levels and excessive costs		A 5 year strategic workforce plan provides direction to workforce capability across the organisation. Competency programs have been developed for all staff. Identified training gaps are captured in ongoing performance development plans. Sydney Water uses Compass, an on-line system for performance and training management. Annual divisional strategic workforce plans analyse the workforce and identify

Clause	Requirements	Risk	Target for Compliance	Comments
				issues that impact on the business objectives
	x. Contingency planning covering both emergency management and business continuity	High risk. Failure to adequately respond to a risk event may result in financial loss, litigation, impacts on service levels and loss of business reputation		Sydney Water has a comprehensive contingency planning process in place.
	xi. Asset rationalisation and disposal	Medium risk. Non- compliance may result in the business retaining underutilised or inefficient assets		The ongoing use of assets is considered in the planning process. Redundant assets are made safe when taken out of routine use.
	c) Robust and transparent decision making processes that balance acceptable risk with cost and service provision to achieve prudent, efficient and effective operating and capital investment;	High. Non-compliance could result in excessive costs and/or reduced service levels		Investment options are analysed on a lifecycle cost basis as well as other criteria. Asset management strategies are founded on logical risk management criteria. Documented decision frameworks facilitate consistent and rational decision making across the organisation. Supporting information systems are well developed and are being further refined
	<ul> <li>d) An approach that achieves the lowest cost of service delivery through the effective life cycle management of the asset base; and</li> </ul>	High. Non-compliance could result in excessive costs and ineffective resource allocation		An integrated infrastructure planning process exists with infrastructure investment options assessed on lifecycle costs. Procurement practices seek to achieve value for money outcomes. Operational monitoring and control is highly developed & allows Sydney Water to maximise the capability of its existing network assets. Maintenance strategies are robust.

Clause	Requirements	Risk	Target for Compliance	Comments
	e) Robust and transparent processes of review and continuous improvement in asset management.	Medium-High. Non- compliance may result in ineffective and/or inefficient asset management practices in the future leading to inefficient service provision and increased costs to customers		<ul> <li>Sydney Water demonstrated a commitment to continuous improvement through, for example:</li> <li>Lessons learnt, gap analysis and action plans in all asset management plans,</li> <li>Involvement in asset management initiatives/ research undertaken by Universities, WSAA, WERF and other research organisations</li> </ul>



# 4. Potential Asset Management Improvements

During the audit we identified potential improvements which should be investigated by Sydney Water in further development of its asset management practices. In addition, as part of the efficiency review we may identify further potential improvements which we may include in our separate Efficiency Report. The potential improvements identified at audit included the following:

- (i) In general we observed robust alignment between service expectations, investment decisions and operational practices. However, while planning staff reported that there is no explicit requirement to provide water for fire-fighting for bush fires, operational staff reported that in the event of bush-fires water treatment plant production rates are immediately raised as quickly as possible and additional water is conveyed to affected areas. We recommend that Sydney Water explicitly defines whether there is a requirement to provide water for fighting bushfires, and if so recognise this requirement in investment decisions. Fire-fighting requirements, may for example, influence the required level of reliability at water filtration facilities and require immediate execution of renewals which might otherwise be deferred in plants with capacity significantly higher than average demand;
- (ii) We observed that Sydney Water is applying more rigour and assigning greater accountability in its business case development, and is seeking to further improve the process. It would be desirable to improve the reliability of the operation and maintenance costs estimates in the options analysis and as part of the improvement process;
- (iii) Overall, planning studies we reviewed generally met good practice requirements. However in one study reviewed as part of this audit, the basis for concluding that the preferred option was the least lifecycle cost option was unclear and it was uncertain whether land acquisition costs were recognised in the lifecycle cost assessment. We suggest that all planning reports state the basis on which it is determined that the preferred option is the least lifecycle cost option (if so) and justify the exclusion of detailed analysis of operating and maintenance costs or renewals costs or estimation of land acquisition costs where that is the case. We also suggest that Sydney Water prepares guidance for planning engineers and consultants on the circumstances in which full analysis of operating and maintenance costs and renewals costs or estimation of items such as land acquisition would be redundant;
- (iv) Within the planning reports reviewed for this audit, we observed a variation in the approach adopted for multi-criteria analysis. In order to ensure that similar decisions are made on a consistent basis it is suggested that Sydney Water provides guidance to planning engineers and consultants to ensure that:
  - Where items which could in principle be estimated, for example land acquisition costs or operating and maintenance costs, are included as non-cost items, their scoring relative to the cost items is commensurate to their likely cost;
  - Where non-cost items for which robust estimates of customer willingness to pay or reasonable proxies for customer willingness to pay are available, for example carbon pricing for greenhouse gas emissions, that their scoring relative to the cost items is commensurate with the ratio of the estimates of or proxies customer willingness to pay relative to the cost items; and
  - the scoring and weighting given to non-cost items, and the overall weighting given to all non-cost items relative to cost, is similar in similar circumstances and for similar estimates of capital cost.

- (v) We recognise the value of decision frameworks in providing guidance on investment decisions and strategies. However, in contrast to decision framework for water main renewals and similar works, we found it difficult to relate the Facilities Decision Framework to decision criteria actually documented in business case documentation for wastewater treatment facilities or water filtration plants. The Facilities Decision Framework also did not reflect considerations such as asset criticality and the impact of spare available capacity, even though e these factors are considered when making renewal decisions. We suggest that Sydney Water reviews the level of detail provided in the Facilities Decision Framework and whether it is appropriate for one Framework document to cover a wide range of asset types and scenarios;
- (vi) The asset management plans were considered to be of a high standard, clear and informative. Potential improvements include the standardising the presentation of key outputs, for example renewal expenditure projections, across all plans to allow consistency in the level of detail provided;
- (vii) The separation of water and sewerage mains into no-fail (critical) and plan-to-fail categories allows Sydney Water to focus its resources on assets with greatest consequence of failure. The process could be further refined by allocating a risk rating to all assets based on a consistent multi-criteria consequence of failure and condition rating (likelihood of failure). This allows a transition from less critical to critical assets rather than a definite separation, as is the current case, and which may identify additional critical assets that may not be captured using the current process. This would also help in identifying the level of acceptable risk being applied;
- (viii) Sydney Water should model its financial position, asset risk profile and service levels (e.g. main breaks) over a 30 year period based on a range of scenarios (e.g. rate of water and sewer main deterioration). Likely scenarios should be documented in the relevant asset management plans and, for a whole-of-business, in the State of the Assets Report. Sydney Water already has well developed projections in the short to medium term. However it would be prudent to assess likely long term service and asset sustainability impacts to guide any future business strategies;
- (ix) The capture of 'as-constructed' data for water and sewerage mains is a relatively laborious. Opportunities exist to automate this process using products such as ADAC (Asset Design As Constructed);
- (x) We observed that the budgeted and actual cash-flows for maintenance capital expenditure were not in harmony until close to the financial year. The budget assumed a near linear expenditure while the bulk of expenditure occurred towards the end of the financial year. It was explained that this was due to the budgeting on an annual basis. Sydney Water should investigate options for overcoming this trend such as planning two years ahead and including planning/ investigation/design costs for the second year to be included in the first year budget.
## 5. Alliance Procurement

IPART has specifically requested that the Asset Management review include consideration of whether the use of Alliance procurement methods leads to the lowest asset lifecycle costs in comparison with other procurement methodologies including build-own-operate, design and construct contracts and or Sydney Water construction.

Sydney Water has used a range of Alliances over the last ten years. Program alliances such as the NetWorks Alliance have been used to undertake a large number of relatively routine jobs. Project alliances have been used to undertake unique and complex one-off projects including the Sydney Desalination Delivery Pipeline as well as renewal, refurbishment and installation of a range of assets.

In undertaking this review, we have focused on the capital expenditure costs of Alliances. We do not consider that operating and maintenance expenditure would have significant influence on the lifecycle costs of assets delivered through Alliances.

## 5.1 Program Alliances

Program alliances used by Sydney Water include the NetWorks Alliance, the SewerFix Wet Weather Alliance and the Priority Sewerage Program Alliance.

Sydney Water has undertaken a number of reviews and benchmarking studies on the NetWorks Alliance. One of these studies compared the average cost per kilometre of pipe laid for the NetWorks Alliance, the Sydney Water Civil Group and other major water organisations outside Sydney. The other organisations use a range of procurement methods including Alliance, Design and Construct and Schedule of Rates Contracts.

The study did not attempt to correct the average cost per kilometre laid for pipe size or other construction conditions. Nevertheless, the data in that study indicates that:

- The average costs of pipe laid in Sydney were in the order of \$500/m to \$550/m (but the figures varied considerably from year to year);
- Average costs of pipe laid outside of Sydney ranged from around \$200/m to just over \$400/m;
- Outside of Sydney, the average costs per metre for pipe laid by an Alliance were about 20% more expensive than the average costs for pipe laid by Design and Construct contracts, but less expensive than pipes laid under a Schedule of Rates contract.

The cost differences do not necessarily indicate that Alliance delivery is more or less expensive than other procurement models because factors other than procurement methodologies may have impacts greater than any differences arising from the choice of procurement model.

Sydney Water has attempted to explain the differences between the NetWork Alliances costs in Sydney, and the costs for the comparison organisation outside Sydney with the highest cost per metre of pipe laid. Sydney Water identified a number of factors which contributed to higher costs in Sydney.

 Sydney Water is required to undertake a greater amount of open trench construction rather than less expensive techniques such as pipe bursting in central business districts. The reasons for doing so include proximity of other services in narrow, congested streets and high traffic loads;

- The average length of renewals is shorter for Sydney Water construction jobs and therefore establishment and other fixed costs must be spread over a shorter length of pipeline;
- Road authority and other customer requirements which result in a much greater percentage of their works must be undertaken at night compared to other organisations (including their Civil Group) which is more expensive;
- Sydney Water must complete temporary restoration works then pay premium rates to local councils to complete permanent restoration; and
- There are other regulatory and stakeholder requirements which impose additional costs.

However, according to the information provided in the benchmarking study discussed above, there are a number of other factors which should also make work outside Sydney more expensive than in Sydney. The reported ground conditions are worse for the comparison organisations (i.e. rock is encountered more often elsewhere) and the comparison organisations all report a much greater percentage of work in roads and less in grass verges. The profile of pipe diameters is also weighted slightly towards larger diameter pipes for the comparison organisations. According to the information provided in the benchmarking study, average construction costs per metre laid for the NetWorks Alliance were about 12% more expensive than the Sydney Water Civil Projects Group over a three year period from 2007/2008 to 2009/10<sup>1</sup>. The Networks Alliance is undertaking more pipe-bursting, more work at night, more work on roads and some work on larger diameter pipes than the Sydney Water Civil Projects Group, but less of their work was reported to be in difficult ground. In a separate comparison for reticulation mains only, Sydney Water found that that Networks Alliance was 25% cheaper overall than the Sydney Water Civil Projects Group for mains built in 2010/11.

As part of the benchmarking study, the NetWorks Alliance and other organisations were asked to nominate standard costs for undertaking similar project scenarios.

In all cases, the NetWorks Alliance estimates had a 60% or greater cost premium relative to the estimates for other organisations outside Sydney except for some of the scenarios for the organisation using a schedule of rates contract. The factors cited above would cause additional costs in Sydney for these scenarios, but it is unclear whether or not these factors explain all of the higher costs at the Networks Alliance.

In summary:

- (i) Before making adjustments for factors such as differences in pipe diameter and local conditions, the average cost per metre laid rates for Sydney Water's NetWorks Alliance are more expensive than the costs reported in surveys for other procurement models outside of Sydney.
- (ii) The cost differences may be due to differences in the type of work undertaken, the local construction conditions and possibly differences in allocation of overheads rather than necessarily be due to inherent cost differences in procurement models.

Based on the information we have seen, we found that cost differences may be attributable to the type of work undertaken, the working environment, the allocation of overheads and the form of contract. Some information suggests the possibility of a cost premium for procurement through Network Alliance but this is not conclusive. Any premium or saving

<sup>&</sup>lt;sup>1</sup> The cost comparison was made by dividing the expenditure reported in the benchmarking study by the reported metres laid over three years for both the NetWorks Alliance and the Sydney Water Civil Projects Group.

depends on the way the Alliance is structured and implemented, and the commitment of parties to work together.

There is a high level of maturity in the program alliance procurement models in the water industry in the United Kingdom, where Alliances are explicitly used with the goal of reducing final out-turn costs. The target out-turn costs are developed with reference to previous costs for similar work completed by Alliances in that area and specifically require cost efficiency improvements.

While Sydney Water is adopting efficiency improvement targets for its program alliances, not all of the Independent Estimator reports prepared for Sydney Water specifically identify the comparison projects upon which the assessments are based but instead reference summary cost comparison data held by consultants.

Sydney Water is reviewing the form of Alliance or partnering arrangements to maximise the benefits while reducing costs, and plans to review the practices adopted in the United Kingdom.

### 5.2 Project Alliances

Sydney Water has elected to use project alliances for a number of key projects including the Desalination Water Delivery Alliance and the North Head STP PARR (Process Reliability and Renewals Alliance)

Public sector guidelines for the use of Alliances have been developed under a Council of Australian Governments (COAG) initiative, led by the Victorian Department of Treasury and Finance. These guidelines support the use of Alliances where the costs of the project exceeds \$50M, and the project is particularly complex with risks that cannot easily be defined or managed at the outset of the project and / or the cost of transferring risks is prohibitive.

For complex or risky projects, it is difficult to determine in advance what the out-turn costs are likely to be, and for similar reasons it is not possible to retrospectively compare costs, because the realisation of project risks will skew the costs for projects delivered by traditional procurement methods. In these circumstances, Alliances have the advantage that they avoid the costs and time delays arising from dispute resolution, and enable owners, designers and constructors to work collaboratively to identify innovative solutions. These benefits are difficult to quantify but are acknowledged to substantial and real.

The Desalination Water Delivery Pipeline and the North Head STP PARR projects were complex and exhibited significant risks.

Build-own-operate and similar contracts offer attractive financing alternatives, but are not generally justified on the basis of recognised life cycle cost savings.

## 5.3 Appraisal of Current Practices

The practices adopted by Sydney Water for the selection and management of Alliances included many features of good practice widely used in industry including consideration of alternative procurement methodologies; documentation of procurement selection decisions; use of specialist procurement advisors to advise on the set-up and management of Alliances; and use of independent estimators to validate Target Out-turn Costs.

However, when compared to best practice there is scope for improvement.

The Victorian Government Guidelines recommend that Alliances be developed in the context of a Value for Money Framework to align project actions with the key drivers of value identified in the business case.

Price expectations for program alliances should also be clearly stated at the time of the procurement model decision and at time of approval of the Alliance contract, and reviews of the delivery model and contract should reference the initial expectations.

Where non-cost criteria are used either for selection of the procurement model or selection of nonowner participants within a multi-criteria analysis framework, effort should be made to objectively justify the criteria weighting and scores adopted.

We also noted that there is no standard classification of cost categories (e.g. program management versus direct cost) between Alliances. Such standard classification would also facilitate cost comparisons between work undertaken by the Alliances and work undertaken by other means.

### 5.4 Improvements to Alliance Procurement Practices

During the audit we identified improvements which Sydney Water should consider adopting. We noted that Sydney Water was already seeking to investigate a number of these improvement opportunities. Potential improvement opportunities include:

- Undertaking the planned review of best practice Alliance procurement practices in the United Kingdom and determine the extent to which those practices may be applied for procurement at Sydney;
- Undertaking further reviews to determine the reason for apparent cost differences between the NetWorks Alliance, Sydney Water Civil Projects Group and delivery of similar projects elsewhere;
- (iii) Continuing to seek other opportunities to benchmark the costs of different procurement models and strategies to validate procurement model and strategy selection decisions;
- (iv) Considering of the findings of benchmarking studies / cost investigations when reviewing the NetWorks Alliance and making decisions about major procurement strategies and the amount of work delivered via the Sydney Water Civil Projects Group;
- (v) Considering undertaking trials of more extensive use of Design and Construct methodologies and / or other methodologies which have possible cost advantages relative to Alliances for routine work currently undertaken by Program Alliances;
- (vi) Including price or expected cost as an explicit criteria in all procurement model, strategy selection and major procurement contract approval decisions (with the possible exception of Alliances with substantial complexity or difficult to define risks);
- (vii) Where non-cost criteria are used for procurement model and major contractor selection decisions, seeking objective data to validate the weighting and scoring of those criteria;
- (viii) Implementing reviews of cost and performance of procurement strategies and models against initial cost and performance expectations and use of the results of the reviews to strengthen the validation of procurement model decisions;
- (ix) Developing consistent definitions for cost categories such as direct costs, indirect costs and program management costs;
- (x) Ensuring that Project Management Office and other overheads are appropriately allocated for Alliances, work undertaken by the Sydney Water Civil Projects Group and any other delivery mechanisms to facilitate cost comparisons.



## 6. Conclusions

The audit confirmed that Sydney Water is complying well with both the spirit and the letter of the requirements of its Operating Licence in relation to its asset management obligations. Sydney Water obtained Full Compliance with the Clauses considered as part of this Audit.

Sydney Water demonstrated a consistent and highly developed understanding of asset management and its role in supporting sustainable delivery of services to customers and the achievement of the business' objectives. A number of initiatives have been highlighted in this report.

We have made some suggestions in relation to potential asset management improvements. In particular we have suggested that Sydney Water models longer term scenarios in relation to its asset risk profile, service levels and financial position to guide any future business strategies.

IPART has specifically requested that the Asset Management review include consideration of whether the use of Alliance procurement methods leads to the lowest asset lifecycle costs in comparison with other procurement methodologies. The practices adopted by Sydney Water for the selection and management of Alliances included many features of good practice. However, opportunities may exist to achieve further cost efficiencies in infrastructure delivery. We noted that Sydney Water was already seeking to investigate a number of these improvement opportunities.



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# 7. Recommendations

There are no key recommendations.

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## C | Opportunities for Improvement

The operating licence auditor's report lists a number of opportunities for improvement. These opportunities are listed below. The numbering in brackets following each point identifies the number assigned to it in the auditor's report.

1. Drinking Water Quality

1.1 Review the Water Quality Level of Service obligations for asset and maintenance management, in particular: define a maximum tolerable hole size for water tanks that constitutes a 'vermin-proof' condition and a tolerance for the extent of direct runoff that may enter tanks through holes in roofs or other entry mechanisms.

1.2Establish rules to minimise the presence of holes below the roofs of existing tanks that represent possible entry points for vermin and minimise the ingress of runoff from existing tank roofs into the tank including with respect to the anticipated design life and associated renewal/replacement of the relevant components.

1.3 prior to 30 June 2012, conduct an audit of tanks that reports the number and location of tanks that fail to meet these requirements, and report the results of this audit to IPART.

1.4 prior to 30 June 2012, establish a remediation timetable to expeditiously rectify the faults identified in recommendation 2.1.3, that is to establish a program to fill/mesh any holes below the roofs of existing tanks which may permit the entry of vermin into tanks and address unacceptable water ingress to tanks;

1.5 prior to 30 June 2012 amend maintenance strategy, procedures and associated work instructions and checklists, the asset management renewal/replacement strategy, training and competency needs for staff for inspection, maintenance, testing and operation and renewal/replacement/new specifications for tanks to meet these criteria.

- Where NSW Health has signed off water quality management plans, the critical limits involved need to be observed. Enhance awareness among recycled water system operators of the critical limit criteria endorsed by NSW Health and of the regulatory significance of achieving these criteria. (SR2.1)
- 3. Clarify with NSW Health the specific details of filtration performance critical limits do they apply to individual or combined filter effluent sampling points? This discussion should cover both potable water plants from higher risk sources/periods and recycled water plants supplying high exposure uses. (SR 2.2)

- 4. Review ways to help keep caps on the sample taps in areas where contractors might use those taps to get water and not replace them. This recommendation also applies at service reservoirs. (For details, refer to Appendix 2, page 7) (SR 2.3)
- 5. Building on the existing analysis for each plant, and as part of the move to disinfectant contact time (CT) reporting at plants, identify the minimum worst case CT (shortest possible contact time, taking into consideration short-circuiting effect) for each plant to ensure that this cannot drop below a specified minimum value. (SR 2.4)
- 6. If moving away from hatch alarms, consider the potential for using some other method to control the risk such as portable ladder access. (SR 2.5)
- 7. Review the implications of the P1 (high) to P4 (low) priority system for the asset inspections being the converse of the P1 (low) to P6 (high) priority system for the more regular inspections for reservoirs. (SR 2.6)
- 8. In validating recycled water schemes, consider moving away from any reliance being placed upon, or any reference being made to, the indicative estimated values in Table 3.4 of the AGWR and rely instead on objective, verifiable evidence for all assumptions made in validation for all schemes. (SR 2.7)
- 9. Although outside of Sydney Water's area of responsibility, to help mitigate risks to Sydney Water schemes, seek to promote enhanced control of post-occupancy plumbing cross-connection risks where involuntary consumption of recycled water may arise. (SR2.8)
- 10. Review the implications of the 3 sample site codes being identical for the exit of the 3 chlorine contact tanks at Rouse Hill Recycled Water Plant. (SR2.9)
- 11.Sydney Water appears confident the evident increasing trend in unplanned water interruptions is manageable. Questions were raised regarding how Sydney Water intended to monitor these increases and at what point would other options be investigated to ensure that the measure target was not exceeded. Due to the potential lag between performance and implementation of mitigation activities, we would recommend that Sydney water determine what the trigger points would be where additional works/investigations will be undertaken to ensure ongoing compliance with unplanned interruptions measure.
- 12. A number of manual processes were in place to compile and there is a potential for errors with the large number of spread sheets that are being linked etc to provide appropriate reporting. We understand that this is being addressed in the near future.
- 13. Optimise internal work processes used for Dial Before You Dig requests and work with other agencies to streamline the process.
- 14. Include translation services (written in different languages) on the front page of the website to assist those customers and tenants etc with English as a second language.

- 15. Improve the searching function of the website to ensure important documents such as the customer contract and other customer policies are easily accessible, for example included in the "Quick Links" function.
- 16.Provide more detail regarding the complaints process on the Sydney Water Website to ensure that customers understand the different steps involved in the complaint resolution process.
- 17. Provide a link to the Complaints Policy on the website where the complaints process is addressed.
- 18.From 2012/13, ensure that Water Wrap contains some condensed wording around the complaints handling process in addition to the "our contract with you" pamphlet.
- 19. Ensure that the information contained in transmittal emails to regulator/s clearly explains the purpose of the correspondence. For instance, the subject line of the email should contain more information regarding the subject of the email and the relevant regulator (eg, IPART, Transmittal of 1 September Reports).
- 20. While the current segmented document and records control system appears to be functional, it would be beneficial for Sydney Water to consider having an overarching document control system for the business. It is understood that a corporate-wide document control system is currently being considered.
- 21. The Project Manager Regulatory Affairs is the main hub for use and control of the Online Compliance Program. Having largely a sole person with this responsibility could present a risk for Sydney Water. While it is acknowledged that risk is mitigated somewhat by the creation of a manual for use of the Online Compliance Program by the Project Manager, the manual is currently not a controlled document (although it is accessible from the S drive) and should become so.
- 22. **MoU Health (draft 2011)**: While there is a responsibility on NSW Health at Clause 8.4 to provide advice on wastewater management activities, it is suggested that at Clause 4.2, wastewater and in particular, health issues related to biosolids, are formally recognised (not withstanding that ad hoc joint working parties may be established to investigate specific technical issues).
- 23.**MoU WAMC (2011)**: Note that Attachment A (The Western Sydney Recycled Water Initiative: Operating Protocol) will have to be reviewed more frequently than the MoU in entirety to ensure that contact details and personnel remain current. Note that Section 9.2 of the Protocol requires at least annual review by the parties, however, it is advised that Sydney Water includes a requirement in its Folio of Progress to ensure that annual review of the Attachment will be undertaken and that within the 'Interpretation' section of the Folio, that Sydney Water states that annual review is only for the Protocol itself and not of the MoU in its entirety.

#### C Opportunities for Improvement

The asset management auditor listed a number of opportunities for improvement in their report. These have been presented again below:

- 1. In general the auditors observed robust alignment between service expectations, investment decisions and operational practices. However, while planning staff reported that there is no explicit requirement to provide water for fire-fighting for bush fires, operational staff reported that in the event of bush-fires water treatment plant production rates are immediately raised as quickly as possible and additional water is conveyed to affected areas. The auditors recommend that Sydney Water explicitly defines whether there is a requirement to provide water for fighting bushfires, and if so recognise this requirement in investment decisions. Fire-fighting requirements may, for example, influence the required level of reliability at water filtration facilities and require immediate execution of renewals which might otherwise be deferred in plants with capacity significantly higher than average demand.
- 2. The auditors observed that Sydney Water is applying more rigour and assigning greater accountability in its business case development, and is seeking to further improve the process. It would be desirable to improve the reliability of the operation and maintenance costs estimates in the options analysis and as part of the improvement process.
- 3. Overall, planning studies the auditors reviewed generally met good practice requirements. However in one study reviewed as part of this audit, the basis for concluding that the preferred option was the least lifecycle cost option was unclear and it was uncertain whether land acquisition costs were recognised in the lifecycle cost assessment. The auditors suggest that all planning reports state the basis on which it is determined that the preferred option is the least lifecycle cost option (if so) and justify the exclusion of detailed analysis of operating and maintenance costs or renewals costs or estimation of land acquisition costs where that is the case. The auditors also suggest that Sydney Water prepares guidance for planning engineers and consultants on the circumstances in which full analysis of operating and maintenance costs or estimation of items such as land acquisition would be redundant.
- 4. Within the planning reports reviewed for this audit, the auditors observed a variation in the approach adopted for multi-criteria analysis. In order to ensure that similar decisions are made on a consistent basis it is suggested that Sydney Water provides guidance to planning engineers and consultants to ensure that:
  - a) Where items which could in principle be estimated, for example land acquisition costs or operating and maintenance costs, are included as non-cost items, their scoring relative to the cost items is commensurate to their likely cost,
  - b) Where non-cost items for which robust estimates of customer willingness to pay or reasonable proxies for customer willingness to pay are available, for example carbon pricing for greenhouse gas emissions, that their scoring relative to the cost items is commensurate with the ratio of the estimates of or proxies customer willingness to pay relative to the cost items, and

- c) The scoring and weighting given to non-cost items, and the overall weighting given to all non-cost items relative to cost, is similar in similar circumstances and for similar estimates of capital cost.
- 5. The auditors recognise the value of decision frameworks in providing guidance on investment decisions and strategies. However, in contrast to decision framework for water main renewals and similar works, the auditors found it difficult to relate the Facilities Decision Framework to decision criteria actually documented in business case documentation for wastewater treatment facilities or water filtration plants. The Facilities Decision Framework also did not reflect considerations such as asset criticality and the impact of spare available capacity, even though e these factors are considered when making renewal decisions. The auditors suggest that Sydney Water reviews the level of detail provided in the Facilities Decision Framework and whether it is appropriate for one Framework document to cover a wide range of asset types and scenarios.
- 6. The asset management plans were considered to be of a high standard, clear and informative. Potential improvements include the standardising the presentation of key outputs, for example renewal expenditure projections, across all plans to allow consistency in the level of detail provided.
- 7. The separation of water and sewerage mains into no-fail (critical) and plan-to-fail categories allows Sydney Water to focus its resources on assets with greatest consequence of failure. The process could be further refined by allocating a risk rating to all assets based on a consistent multi-criteria consequence of failure and condition rating (likelihood of failure). This allows a transition from less critical to critical assets rather than a definite separation, as is the current case, and which may identify additional critical assets that may not be captured using the current process. This would also help in identifying the level of acceptable risk being applied.
- 8. Sydney Water should model its financial position, asset risk profile and service levels (eg, main breaks) over a 30-year period based on a range of scenarios (eg, rate of water and sewer main deterioration). Likely scenarios should be documented in the relevant asset management plans and, for a whole-of-business, in the State of the Assets Report. Sydney Water already has well developed projections in the short to medium term. However it would be prudent to assess likely long term service and asset sustainability impacts to guide any future business strategies.
- 9. The capture of 'as-constructed' data for water and sewerage mains is a relatively laborious. Opportunities exist to automate this process using products such as ADAC (Asset Design As Constructed).

#### C Opportunities for Improvement

10. The auditors observed that the budgeted and actual cash-flows for maintenance capital expenditure were not in harmony until close to the financial year. The budget assumed a near linear expenditure while the bulk of expenditure occurred towards the end of the financial year. It was explained that this was due to the budgeting on an annual basis. Sydney Water should investigate options for overcoming this trend such as planning 2 years ahead and including planning/investigation/design costs for the second year to be included in the first year budget.