

Hunter Water Corporation
Operational Audit 2000/2001

INDEPENDENT PRICING AND REGULATORY TRIBUNAL
OF NEW SOUTH WALES

Hunter Water Corporation
Operational Audit 2000/2001

Compliance No 4, 2001

November 2001

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I N D E P E N D E N T P R I C I N G A N D R E G U L A T O R Y T R I B U N A L
O F N E W S O U T H W A L E S

Our reference: 01/322

Contact: Liz Livingstone
Ph: (02) 9290 8429
Fax: (02) 9290 8462
Liz-Livingstone@ipart.nsw.gov.au

19 November 2001

The Hon. Kim Yeadon MP
Minister for Energy
Level 34
Governor Macquarie Tower
1 Farrer Place
SYDNEY NSW 2000

Dear Minister

Hunter Water Corporation 2000/2001 Operating Licence Compliance Audit

I am pleased to present you with the independent Operational Audit Report for Hunter Water Corporation for the period from 1 July 2000 to 30 June 2001. Enclosed is a copy of the Audit Report along with draft Ministerial Requirements (Attachment 1) for your information and approval.

Hunter Water has performed very well against its licence over 2000/2001 and achieved full or high compliance for all requirements. However the Auditor has made a number of recommendations that would ensure continual improvement and I draw these to your attention in the following comments.

Water supply

I note that Hunter Water complied with all water quality requirements in its licence. However the auditor identified potential risks to the quality of the water supply and made recommendations that these be investigated. These relate to the efficiency of disinfection in remote parts of the water supply system and to assessing the role of urban development in the catchment areas. Identifying and addressing risks is important for safeguarding the water supply. To this end the Tribunal endorses Audit recommendations 1 and 2:

- 1. Hunter Water should investigate the efficiency of disinfection in remote parts of the system, and develop strategies for improvements, including additional sampling if appropriate.*

- 2. Hunter Water Should provide a risk management plan of urban development within water catchments in order to assist the assessment of the costs and benefits of any further steps to reduce these risks.*

During the audit period extreme hot weather contributed to very low water pressures for some customers. Some customers did not receive water at all. I note that Hunter Water has taken action to prevent the recurrence of these problems. In order that the effectiveness of these actions is assessed and that pressure problems are monitored I endorse Audit recommendation 4:

- 4. Hunter Water should monitor the performances of all the problem low pressure areas and report annually about the severity of the problems.*

Dam Safety

The auditors found that two items from the Dams Safety Committee report remain outstanding after the 2000/01 audit period. I endorse Audit recommendations 6 and 7 that require these be completed:

- 6. Hunter Water should provide a formal report to the Dam Safety Committee on the outcome of the inspection of Campvale Culvert by 31 December 2001.*
- 7. Hunter Water should communicate with State Emergency Services, and ensure that a meeting with the community downstream of Chichester Dam is held no later than 29 November 2002.*

Environmental Management Plan

I note that Hunter Water has complied with 84 of the 85 actions in its Environmental Management Plan (EMP) and that the plan continues to develop with the introduction of measurable performance standards. The auditor has identified opportunities for further improvement. In particular, the Tribunal draws your attention to Audit recommendations 9 and 12:

- 9. The introduction by Hunter Water of measurable performance standards into the 2001/2002 Environmental Management Plan (EMP) should be assessed in the 2001/2002 Audit.*
- 12. Most of the relevant recommendations of the Williams River Inquiry have been completed by Hunter Water. The EMP should be updated to reflect this and provide a long term outlook for management of the catchment.*

In relation to demand management, the auditor states that Hunter Water has adopted a figure of 210KL/household as the long term average target for residential consumption. However annual variation to demand makes it difficult to determine the long term average. The Tribunal endorses Audit recommendation 16:

- 16. Hunter Water should develop a climatic model to enable it to assess its long term average against the adopted target of 210kL per household per annum.*

Customer Management

The Tribunal believes that customer management is a fundamental part of Hunter Water's business. The auditors have reported satisfactory performance over the audit period but have made several recommendations that would further improve performance. The Tribunal particularly considers that an investigation and report on the integration of the customer service systems should be completed as a matter of priority, as recommended by the auditors. The Tribunal also endorses the recommendation that the customer charter be better aligned with the measures in the Operating Licence. The recommendations are as follows:

19. The Customer Charter should be reviewed with specific focus on:

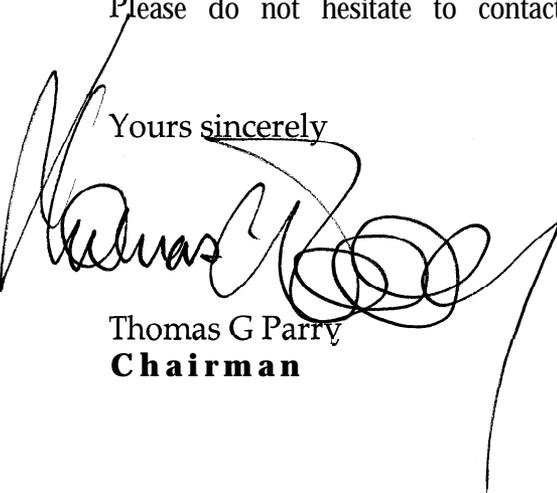
- (1) the consistency between measures used in the licence and the Customer Charter;*
- (2) clarifying the purpose of the rebate – compensation, goodwill or motivation for improvement; and*
- (3) methods for measuring discontinuities and low pressure flows (from time of report or time valve shut down).*

22. Suggest that an investigation and subsequent report be made concerning the integration of the Assets and Operations Management System (AOMS) and Customer Care Systems (CSS). The report should be completed by 30 June 2002, and assist in streamlining responses to customers.

These recommendations have all been addressed in the attached draft Ministerial Requirements.

Please do not hesitate to contact me if you wish to discuss this matter further.

Yours sincerely



Thomas G Parry
Chairman

Independent Pricing and Regulatory Tribunal

2000/01 Operational Audit of Hunter Water Corporation

Audit Report

12 November 2001



Independent Pricing and Regulatory Tribunal

2000/01 Operational Audit of Hunter Water Corporation

Audit Report

12 November 2001

Author: Robyn Campbell

Checker: Gidi Azar

Approver: Gidi Azar

Disclaimer

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Abbreviations

AOMS	Assets Operations Management Systems
ARMCANZ	Agricultural and Resource Management Council of Australia and New Zealand
BOD	Biological Oxygen Demand
CCS	Customer Care System
CMC	Catchment Management Committees
CSS	Customer Service Systems
DLWC	Department of Land and Water Conservation
DoH	Department of Health
DSC	Dam Safety Committee
DUAP	Department of Urban Affairs and Planning
EIA	Environmental Impact Assessment
EIP	Environmental Improvement Plan
EMP	Environmental Management Plan
EMS	Environmental Management System
EP	Equivalent Population
EPA	Environment Protection Authority
EPU	Environmental Policy Unit, Hunter Water
ESD	Environmentally Sustainable Development
HCMT	Hunter Catchment Management Trust
HRMC	Hunter River Management Committee
HWC	Hunter Water Corporation
HWA	Hunter Water Australia
IPART	Independent Pricing and Regulatory Tribunal
ISO	International Standards Organisation
ML	Megalitre
mm	Millimetre
MoU	Memorandum of Understanding
NATA	National Analytical Testing Authority
NFR	Non-Filtrable Residue
NHMRC	National Health and Medical Research Council
PRP	Pollution Reduction Program
QA	Quality Assurance

SCADA	System Control and Data Acquisition
SES	State Emergency Services
SPEM	Service Performance Evaluation Manual
TCM	Total Catchment Management
YTD	Year to Date
WPS	Water Pumping Station
WRA	Water Reform Agenda
WWTW	Wastewater Treatment Works

1 Executive Summary

1.1 Background

On 1 November 2000, the NSW Government proclaimed the *Independent Pricing and Regulatory Tribunal and Other Legislation Amendment Act*, which transferred responsibility for regulating the Operating Licence from the Licence Regulator to the Independent Pricing and Regulatory Tribunal (IPART).

Hyder Consulting was commissioned by the Independent Pricing and Regulatory Tribunal (IPART) to undertake the 2000/2001 operational audit of Hunter Water Corporation. The audit was carried out in accordance with the requirements of the Operating Licence granted under the Hunter Water Act 1991.

Clause 8 of Section 12 of the *Hunter Water Corporatisation Act, 1991* states the requirement for an annual operational audit to assess HWC's performance of its obligations under the Operating Licence. The context of the audit is provided for in the Act under Section 8 of the Operating Licence, and the scope is further defined in Schedule 5 of the Operating Licence. IPART's terms of reference required the audit to cover the additional aspects of Hunter Water's operation including customer service, Ministerial requirements and the recommendations of last year's operational audit.

There are four sources for the requirements, as per the following groups:

- Operating Licence
- Memoranda of understanding, licences and other legal requirements
- Ministerial requirements, including recommendations from 1999/2000 operational audit
- Other requirements

The specific requirements and compliance status are summarised in Section 1.3 below.

The 2000/2001 operational audit covers the period between 1st July 2000 and 30th June 2001. It has been conducted in accordance with the methodology outlined in the relevant Australian Standards including AS/NZ ISO 14011:1996 Guidelines for Environmental Auditing – Audit Procedures and AS/NZ ISO 9001 – Quality Systems.

1.2 Performance

1.2.1 Compliance with the Operating Licence conditions.

Hunter Water Corporation demonstrated compliance with the conditions of the Operating Licence for the period 2000/01.

1.2.2 Water quality

This is the most important standard, as it relates directly to public health. It requires Hunter Water to adhere to water quality standards based on the guidelines published in the NHMRC/ARMCANZ Australian Drinking Water Guidelines.

Hunter Water complied with the Operating Licence requirements with respect to the quality of drinking water supplied to its customers.

The auditors recommend that, whilst Hunter Water demonstrated full compliance with the water quality requirements of the licence, further studies should be undertaken to assist with continual improvement.

1.2.3 Service interruptions

The Operating Licence requires that no more than 8 percent of customers may experience interruption (discontinuity) to their water supply.

Hunter Water complied with this requirement. Interruptions to the supply have been experienced by less than 4 percent of customers, significantly less than the limit set by the Licence.

1.2.4 Water pressure

The Operating Licence requires that no more than 5 percent of customers experience low pressure to their water supply.

Hunter Water complied with this requirement. Low water pressure was experienced by 2.5 percent of customers, significantly less than the limit set by the Operating Licence.

The auditors recommend that Hunter Water address the areas where low pressure is experienced regularly.

1.2.5 Wastewater treatment works

The Operating Licence requires Hunter Water to comply with licences issued by the EPA for its wastewater treatment works.

Hunter Water complied with this requirement, with some minor exceptions.

1.2.6 Sewer surcharges

The Operating Licence sets two standards for performance on sewer surcharges. They are an upper limit to sewer surcharges of 1.4 events per

km of pipe, and a maximum of 4 percent of customers experiencing sewer surcharges on their property.

Hunter Water complied with these requirements. The number of surcharges were 1.04 per km of pipe and 1.4 percent of properties were affected by sewer surcharges.

1.2.7 Security of supply against drought

The Operating Licence requires Hunter Water to ensure water restrictions do not occur more often than once ever 10 years.

Hunter Water complied with this requirement, evidenced by a computer model demonstrating that statistically, restrictions would occur once every 12 years. Hunter Water is investing in capital works upgrades to increase drought security.

The auditors recommend that the standard be reviewed, and that Hunter Water assesses the demand taking into account demand management strategies.

1.2.8 Environmental Management Plan

The Operating Licence requires that the auditors report on the performance of Hunter Water against its environmental management plan (EMP).

The EMP has been prepared by Hunter Water, and includes 85 actions aimed at improving the environmental performance. Hunter Water conformed with all but one of these actions. This action requires reporting of the type of pumping station overflows in the annual Environmental Report as well as the number of overflows. Further, Hunter Water demonstrated commitment to environmental management throughout the organisation.

The auditors recommend that Hunter Water considers developing longer term, measurable objectives for its EMP.

1.2.9 Customer management

This is not a requirement of the Operating Licence, but the terms of reference require auditors to assess the performance of Hunter Water on customer management.

Hunter Water has demonstrated continuous commitment to customer service through the utilisation and implementation of the Customer Charter. The Charter outlines Hunter Water's obligations to its customers and provides for customer rebates. It forms an integral part of Hunter Water's customer management system, which is comprised of a contact and complaint register in addition to annual monitoring of customer satisfaction levels. The customer management system has resulted in continuous improvement of service levels..

The auditors recommend that the Customer Charter be reviewed with a view to aligning the Charter with the Operating Licence and rationalising the rebate system.

1.3 Compliance Summary

The following table is a summary of compliance. N/A signifies no action required during audit period.

Operating Licence	
Requirement	Compliance
1. Water quality performance standards	✓
2. Wastewater treatment works	✓ (Minor breaches of conditions, refer section 7.1)
3. Water service interruptions	✓
4. Sewer Surcharges	✓
5. Water pressure	✓
6. Security of water supply against drought	✓
7. In addition, the Operating Licence requires the operational audit to cover the assessment and reporting on the performance and progress against the environmental management plan.	84 out of 85 actions

Memoranda of understanding, licences and other legal requirements	
Requirement	Compliance
8. MoU with EPA	✓
9. MoU with Department of Health	✓
10. MoU with DLWC	✓
11. Licence from EPA under the Protection of the Environment Operation Act. This overlaps with the Operating Licence requirement for wastewater treatment plants (overlaps with 2 above).	✓ (refer item 2 above)
12. Water Management Licence from DLWC.	✓
13. Dam Safety Act 1978.	Refer to 17 below

14. Hunter Water Corporation Limited (Special Areas) Regulation 1997.	N/A
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Ministerial requirements

Requirement	Compliance
15. Operating licence – a review of the licence is required	Not included in this audit
16. Water quality performance and standards – a report on water quality management and improvement program.	✓
17. Dam safety – address outstanding recommendations from Dam Safety Committee report.	One recommendation was outstanding at 30 June 2001, but was completed mid July 2001
18. McClellan inquiry – continue to progress initiatives.	✓

Other recommendations from 1999/00 operational audit

Requirement	Compliance
19. Cryptosporidium and giardia – review of notification protocols.	✓
20. Wastewater treatment works – plans of maintenance.	✓
21. Environmental plan – measurable performance standards.	To be incorporated in 2001/2002 EMP
22. Raw water quality – resolve electronic access by DLWC.	✓
23. Research – continue participation.	✓(ongoing)
24. Water conservation – continue to develop strategies.	Completed August 2001 as required by Water Management Licence
25. Wastewater transportation – complete flow modelling by December 2001.	In progress
26. Customer care – integrate AOMS and Customer Care systems.	In progress

27. Cryptosporidium and giardia – review feasibility of developing a warning system.	✓
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Other requirements

28. Customer management	✓
29. McClellan inquiry recommendations (overlaps with Ministerial requirement no. 4, Item 18 above)	✓

1.4 Recommendations

Following is a list of recommendations, as they appear in the report, with the relevant page number. For full comprehension of the recommendations, they should be read in the context of the accompanying text in the report.

Chapter 6: Water Supply		
Recommendation	Page	
<p>1</p> <p>Hunter Water should investigate the efficiency of disinfection in remote parts of the system, and develop strategies for improvements, including additional sampling if appropriate.</p> <p>Background: <i>Whilst Hunter Water achieved full compliance with microbiological water quality, the total coliform counts in Southern and Northern Regions appear to deteriorate during the warmer months. This may be due to the decay of the primary disinfectant, chlorine, in long lengths of pipe since these remote areas are further away from treatment plants.</i></p>	<p>22</p>	
<p>2</p> <p>Hunter Water should provide a risk management plan of urban development within water catchments in order to assist the assessment of the costs and benefits of any further steps to reduce these risks.</p> <p>Background: <i>The presence of urban development within the catchment is a potential risk to water quality. The impacts of urbanisation on the quality of water within a catchment should be investigated and incorporated into catchment protection and risk reduction plans, as recommended by the McClellan Inquiry findings.</i></p>	<p>26</p>	
<p>3</p> <p>Hunter Water should adopt a policy on the permanent low pressure customers by 30 June 2002.</p> <p>Background: <i>1450 customers are supplied with a pressure of 16m, while all other customers are supplied with 20m.</i></p>	<p>30</p>	
<p>4</p> <p>Hunter Water should monitor the performances of all the problem low pressure areas and report annually about the severity of the problems.</p> <p>Background: <i>Several areas experienced low pressure during times of high demand, with some households experiencing no water at all. Hunter Water has upgraded the water supply system to solve this problem. Monitoring the performance of the upgrades will assist in the production of a management plan for affected areas.</i></p>	<p>31</p>	

5	<p>Demand Management predictions for the next 5 years should reflect the water conservation strategy.</p> <p>Background: <i>Estimates of future demand are based on current annual water consumption of 210 kL per household. Whilst this level of demand is one of the lowest in the country, it may be appropriate to consider further reductions resulting from the continuous implementation of Hunter Water's water conservation strategy.</i></p>	35
6	<p>Hunter Water should provide a formal report to the Dam Safety Committee on the outcome of the inspection of Campvale Culvert by 31 December 2001.</p> <p>Background: <i>Inspection of Campvale Culvert was a recommendation arising from the Dam Safety Committee Report on Grahamstown and Chichester Dams. The recommendation was outstanding at the end of the audit period (although carried out on 12th July 2001), and was therefore not subject to audit. Findings of the inspection verbally presented.</i></p>	39
7	<p>Hunter Water should communicate with State Emergency Services, and ensure that a meeting with the community downstream of Chichester Dam is held no later than 29 February 2002.</p> <p>Background: <i>As the dam owner, Hunter Water have an interest to ensure that the meeting with the community takes place, although the responsibility to initiate proceedings is State Emergency Service's.</i></p>	39

Chapter 7: Wastewater

	Recommendation	Page
8	<p>Hunter Water should prepare plans for transitions and change-overs well in advance, with a focus on meeting licence conditions where practical.</p> <p>Background: <i>This is a mitigation strategy to ensure that non-compliances due to changes (both administrative and physical) are reduced.</i></p>	45

Chapter 8: Environmental Management Plan

Recommendation	Page
<p>9 The introduction by Hunter water of measurable performance standards into the 2001/2002 Environmental Management Plan (EMP) should be assessed in the 2001/2002 Audit.</p> <p>Background: <i>Many objectives in the 2000/01 EMP (which is the subject of this audit) do not have measurable standards, making it difficult to assess performance with respect to recommendations from the previous year's audit.</i></p>	54
<p>10 Hunter Water should develop further medium – long term measurable objectives for inclusion in the EMP.</p> <p>Background: <i>The 2000/01 EMP includes short term (1 year) goals, and ongoing activities, measured annually or biennially. Medium term goals (3 to 5 years), for issues such as water reuse or biosolids, should also be included in the EMP since the EMP is in place for the medium term (5 years).</i></p>	55
<p>11 In accordance with the overriding objective, Hunter Water should develop a method of representing the “cost to the community” and relate this to the actions relating to water resources.</p> <p>Background: <i>The overriding objective relating to water resources is ‘to harvest, treat and provide safe supply of water, with least environmental impact, at reasonable cost to the community’. The cost to the community needs to be addressed in the EMP.</i></p>	55
<p>12 Most of the relevant recommendations of the Williams River Enquiry have been completed by Hunter Water. The EMP should be updated to reflect this and provide a long term outlook for management of the catchment.</p> <p>Background: <i>Hunter Water is required to support the objectives of Total Catchment Management (TCM). Hunter Water also provides support for research as well as financial support.</i></p>	56
<p>13 Specific requirements of the Water Management Licence (WML) which relate to the Corporation’s objectives in environmental management should be developed into medium-long term actions in the EMP.</p> <p>Background: <i>The EMP does not incorporate specific requirements under the (WML), as they are regulated by the Department of Land and Water Conservation (DLWC). At the same time, the WML requirements have environmental facets and it would be beneficial to incorporate these into the EMP to streamline environmental requirements.</i></p>	56

14	<p>Where regular (annual/biannual) reviews of programs or strategies are planned as part of the EMP, it is recommended that a long term program be developed to assist planning and avoid confusion.</p> <p>Background: <i>The EMP requires many annual and biennial reviews of various aspects. A long term plan of these reviews would assist in programming and clarify the requirements.</i></p>	57
15	<p>Hunter Water should identify research opportunities which would provide a benefit in terms of commercial, environmental and efficiency improvements for both the Corporation and its customers.</p> <p>Background: <i>Hunter Water is involved in research initiatives, however not all directly relate to operational issues facing Hunter Water.</i></p>	58
16	<p>Hunter Water should develop a climatic model to enable it to assess its long term average against the adopted target of 210 kL per household per annum.</p> <p>Background: <i>Hunter Water actively encourages effluent reuse and other demand management initiatives. However, climatic variation and annual variation in demand makes it difficult to predict future demand for management purposes. The development and adoption of a modeling tool to assist with reporting would enable Hunter Water to report against water consumption targets.</i></p>	59
17	<p>Hunter Water should include a measure of cost-effectiveness in minimising impacts and maximising efficiencies of the wastewater transportation system.</p> <p>Background: <i>Hunter Water must undertake all reasonable measures to comply with licensing requirements. This must also take into account the cost-effectiveness of various options for doing so.</i></p>	60
18	<p>Hunter Water should complete the flow modelling of the outstanding sewer systems they own by December 2001.</p> <p>Background: <i>This recommendation, from the previous audit (1999/00) is ongoing and due for completion by December of this year. This recommendation should be reviewed in the next operational audit.</i></p>	61

Chapter 9: Customer Management

Recommendation	Page
<p>19</p> <p>The Customer Charter should be reviewed with specific focus on:</p> <p>(1) the consistency between measures used in the licence and the Customer Charter;</p> <p>(2) clarifying the purpose of the rebate - compensation, goodwill or motivation for improvement; and</p> <p>(3) methods for measuring discontinuities and low pressure flows (from time of report or time valve shut down).</p> <p>Background: <i>Hunter Water staff are uncertain of the origins of the Customer Charter standards and objectives. That is, it is not clear if they originated from operational requirements or customer service expectations. The clarification of this would also help to identify purpose of elements of the Charter, such as the rebates available. In addition to this, discrepancies exist between Charter objectives and Licence objectives, such as water pressure and service interruption (discontinuity).</i></p>	72
<p>20</p> <p>Hunter Water should provide the Independent Pricing and Regulatory Tribunal (IPART) with the results of the 2001 Customer Perceptions Survey no later than 31 December 2001.</p> <p>Background: <i>The 2000/01 Customer Perceptions Survey was carried out through a combination of face-to-face and telephone interviews. The results were not available at the time of the audit.</i></p>	81
<p>21</p> <p>Results of the Customer Telephone Satisfaction Survey should provide a methodology for follow up procedures for customers with complaints. This may include measures for complaint resolution.</p> <p>Background: <i>The Customer Telephone Satisfaction Survey interviews 800 randomly selected customers annually, commencing 2001. The Survey from 2001, due to commence toward the end of this year (2001), will be the first of these annual Surveys.</i></p>	82
<p>22</p> <p>Suggest that an investigation and subsequent report be made concerning the integration of the Assets and Operations Management System (AOMS) and Customer Care Systems (CSS). The report should be completed by 30 June 2002, and assist in streamlining responses to customers.</p> <p>Background: <i>Currently, AOMS and CSS are used for different purposes and are not directly linked. It is understood that Hunter Water plans to review these databases in the coming financial year. The auditors believe that this should be done as a matter of priority.</i></p>	82

2 Introduction

2.1 Background

HWC is a State-owned corporation, which provides water and wastewater services to approximately 500,000 people from the Local Government Areas of Newcastle, Lake Macquarie, Maitland, Cessnock and Port Stephens. HWC is responsible for maintaining almost \$2 billion of assets and has a workforce of 450 employees.

The three major water sources of Chichester Dam, Grahamstown Dam and the Tomago Sandbeds serve HWC's water supply system, which comprises 4,100 kilometres of pipes, 71 reservoirs and 61 pumping stations. The Operating Licence sets service requirements for water quality, water supply and pressure.

HWC maintains a wastewater transportation network comprising 3,900 kilometres of gravity reticulation and carrier sewers and 304 wastewater pumping stations. Wastewater is collected from customers and transported through the network for treatment at one of 17 wastewater treatment works (WWTWs). The Operating Licence sets wastewater requirements for sewer surcharges for quality of effluent discharge from the treatment facilities.

HWC is regulated by the following state government agencies:

- IPART, which sets prices and regulates service standards for customers.
- DLWC, which administers HWC's Water Management Licence;
- The EPA, which issues the sewerage system licences, covering mainly effluent discharge;
- The Department of Health, through a memorandum of understanding (MoU) that establishes procedures for communicating results of the Corporation's water quality monitoring programs; and
- The Dam Safety Committee, which regulates the safety aspects of dam management.

2.2 Scope of the Audit

The objective of the audit is to advise and report to the Independent Pricing and Regulatory Tribunal (IPART) on the performance of Hunter Water Corporation (HWC) against its Operating Licence for the period 1 July 2000 to 30 June 2001.

Section 12 of the Hunter Water Board (Corporatisation) Act 1991 provides the requirement for a licence for the operations of HWC. The scope of the Operational Audit is defined in Clause 8 and Schedule Five of the Operating Licence.

Clause 8 of the Operational Licence requires that:

8.1 “The Minister may (annually or at other times), cause an operational audit to be performed of the Licensee’s performance of its obligations under clauses 4.1 and 5.3 (a) of this Licence by an independent expert nominated by the Regulator....., and

8.5 The operational audit will extend to the assessment of and reporting on the performance and progress of the Licensee in relation to the Environmental Plan.”

In undertaking the audit the auditor must:

1. review and assess the level of compliance (or progress) achieved by Hunter Water against the Operating Licence criteria,
2. assess and report on progress by the Corporation in implementing the Ministerial Requirements and Audit Recommendations arising from the 1999/2000 Operational Audit of Hunter Water,
3. identify any factors that have affected the performance for the financial year ending 30 June 2001,
4. identify any factors that could impact on Hunter Water achieving its Operating Licence performance requirements in the future, and
5. based upon the audit assessment, make recommendations on how Hunter Water can improve its performance in the future.

The Minister for Energy has requested that the Tribunal conduct a full review of HWC’s Operating Licence with a view to new arrangements being in place by 1 July 2002. Information gathered through the course of the Audit will be utilised as part of the process.

The auditor is required to report on the extent of substantive compliance with the Operating Licence requirements.

The audit tasks are to be addressed, where appropriate, with reference to the provisions of the Corporation’s Memorandum of Understanding with the EPA, the NSW Department of Health and its Water Management Licence with DLWC.

2.3 Public Submissions

Prior to the commencement of the operational audit, IPART placed advertisements in the Newcastle Herald and the Sydney Morning Herald inviting public comments on the performance of Hunter Water.

No written comments were received.

2.4 Acknowledgment

The auditors acknowledge the cooperation and help received from Hunter Water’s management and staff. Through the audit process, the auditors have interacted with a large number of staff – all of whom were helpful and supportive.

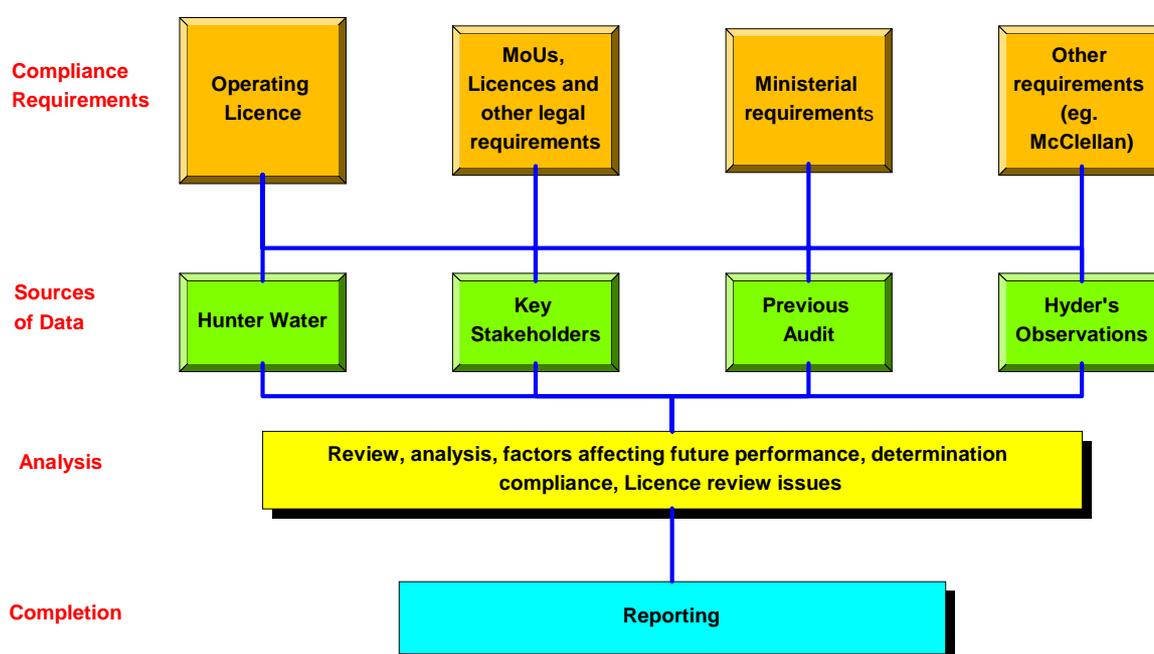
3 Audit Methodology

3.1 Methodology

The general approach to the audit was based on Australian / New Zealand Standard AS/NZS ISO 14011:1996, Guidelines for environmental auditing - Audit Procedures - Auditing of environmental management systems.

The audit methodology followed a four-tier approach as described in Figure 3.1 and as detailed in the following sections.

Figure 3.1 - Audit Methodology



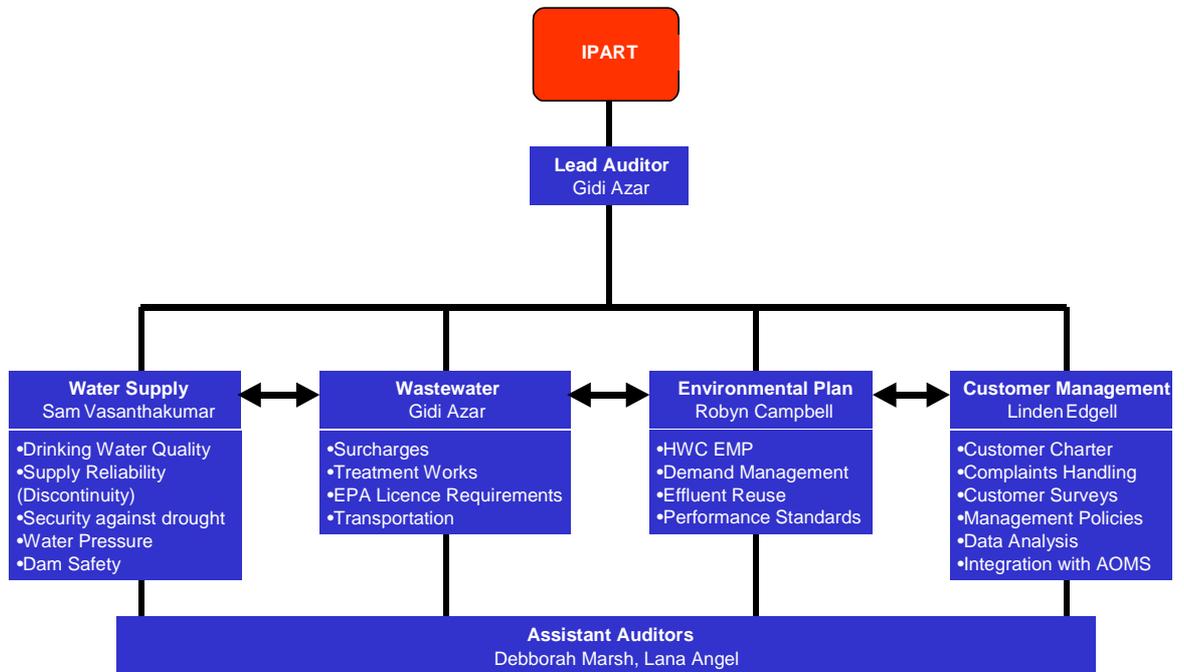
- ❑ **Compliance requirements:** The requirements were defined from the Operating Licence, the terms of reference and other sources. The requirements are summarised in Section 4.
- ❑ **Sources of data:** Data for the audit was collected from the sources shown in the figure above. They are summarised in Section 5.
- ❑ **Analysis:** The auditors analysed the evidence to determine compliance, as well as identifying the factors affecting the current and future performance. These are covered in Sections 6 to 10.
- ❑ **Conclusion:** This report is the documentation of the findings as per AS 14011.

The audit plan is included in Appendix A.

3.2 Audit Team

The audit team comprised of specialist auditors from Hyder Consulting and ERM. The organisation structure of the audit team is illustrated in Figure 3.2 below.

Figure 3.2 - Audit Team



4 Compliance Requirements

4.1 Introduction

As shown schematically in Figure 3.1, there are four main groups of compliance requirements. They are:

- Operating Licence
- Memoranda of understanding, licences and other legal requirements
- Ministerial requirements, including last years' audit
- Other requirements

The compliance requirements are listed below. These requirements, and HWC compliance against them, are discussed in Sections 6-9 of the audit report.

For easy reference, each requirement below is followed by a section and page reference.

4.2 Operating Licence

*Reference
Section, page*

The specific requirements in the Operating Licence are listed below.

- | | |
|---|----------------|
| 1. Water quality performance standards | 6.1, 20 |
| 2. Wastewater treatment works | 7.1, 43 |
| 3. Water service interruptions | 6.5, 27 |
| 4. Sewer Surcharges | 7.3, 46 |
| 5. Water pressure | 6.6, 29 |
| 6. Security of water supply against drought | 6.7, 31 |
| 7. In addition, the Operating Licence requires the operational audit to cover the assessment and reporting on the performance and progress against the Environmental Management Plan. | 8, 53 |
-

4.3 Memoranda of understanding, licences and other legal requirements

The requirements included in this group are:

- | | |
|---|----------|
| 8. MoU with EPA | 7.6, 51 |
| 9. MoU with Department of Health | 6.9, 36 |
| 10. MoU with DLWC | 6.10, 36 |
| 11. Licence from EPA under the <i>Protection of the Environment Operation Act</i> (Refer to Section 7.7.2). This overlaps with the Operating Licence requirement for wastewater treatment plants (No. 2 above). | 7.1, 43 |
| 12. Water Management Licence from DLWC. | |
| 13. <i>Dam Safety Act 1978</i> . | 6.11, 36 |
| 14. <i>Hunter Water Corporation Limited (Special Areas) Regulation 1997</i> . | 6.13, 40 |
-

4.4 Ministerial Requirements

Based on the 1999/00 audit of Hunter Water Corporation, the Minister for Energy, in a letter dated 12 December 2000, issued four requirements to HWC.

In addition, through the terms of reference, and by a clarifying letter dated 20 June 2001, IPART advised that the auditors are required to audit the recommendations of the 1999/00 operational audit.

The requirements under this group are listed below:

Ministerial requirements

- | | |
|---|--|
| 15. Operating licence – a review of the licence is required | <i>Not a requirement of this audit</i> |
| 16. Water quality performance and standards – a report on water quality management and improvement program. | 6.3, 22 |
| 17. Dam safety – address outstanding recommendations from the Dam Safety Committee report. | 6.11, 36 |
| 18. McClellan inquiry – continue initiatives. | 6.3, 22 |
-

Recommendations from 1999/00 operational audit	
19. Cryptosporidium and giardia – review of notification protocols.	6.3, 22
20. Wastewater treatment works – plans of maintenance.	7.1, 43
21. Environmental Plan – measurable performance standards.	8.2.1, 54
22. Raw water quality – resolve electronic access by DLWC.	8.2.4, 56
23. Research – continue participation.	8.2.6, 57
24. Demand management – continue to develop strategies.	6.8, 35
25. Wastewater transportation – complete flow modelling.	8.3.3, 59
26. Customer care – integrate AOMS and Customer Care systems.	9.7.1, 82
27. Cryptosporidium and giardia – review feasibility of developing a warning system.	6.3, 22

4.5 Other requirements

The following requirements were specifically identified in the terms of reference for the audit:	
28. Customer management	9, 66
29. McClellan inquiry recommendations (overlaps with Ministerial requirement no. 4)	6.3, 22

Requirements relating to the management of the Williams River catchment that were covered by previous years' audits have not been included in the 2000/2001 audit. These requirements have been listed in the Williams River Catchment Regional Environmental Plan and the Healthy River Commission's Independent Inquiry into the Williams River (1996). This audit does not cover these requirements as the auditors consider that the key requirements are now covered by the Water Management Licence.

5 Sources of Data

5.1 Hunter Water Corporation

Most of the data used in the audit was obtained from Hunter Water. HWC has established a Regulatory Monitor system, aimed at capturing information relating to the Operating Licence compliance and other regulatory requirements.

Maintaining the Regulatory Monitor files is the responsibility of each division within HWC. The process is coordinated by the Manager, Corporate Planning and Government Regulations.

5.2 Key Stakeholders

The auditors sent letters to key stakeholders, requesting their comments on the performance of HWC for the audit period.

Two responses were received, from the Dam Safety Committee and the Department of Land and Water Conservation (DLWC). Both were positive about the performance of HWC.

The auditors conclude that key stakeholders have no major issue with the service, compliance and impact of HWC.

Appendix B contains a copy of the letter sent, and a distribution list.

5.3 Previous Audit

Last year's operational audit report¹ was used as a source of data for various topics.

5.4 Auditor's Observations

The auditors have met with management and staff of Hunter Water, and have visited a number of facilities including Grahamstown Dam, Tomago Water Treatment Plant, Raymond Terrace WWTW, Hunter Water Australia laboratory in Warrabrook and a customer service centre in Maitland.

In addition, several customers were contacted for their comments on the customer management aspects.

¹ Hunter Water Corporation Operational Audit 1999/2000, Trevor Brown & Associates, 25 November 2000.

6 Water Supply

6.1 Overview

This section covers the standards associated with the harvesting, treatment and distribution of drinking water. While Hunter Water achieved compliance with all Operating Licence requirements, performance in several areas of operation were affected by factors outside Hunter Water's control.

Extreme hot weather during the 2000/01 summer (refer Section 6.14.1) resulted in the development of low pressure areas around the Warners Bay and Wallalong areas. Increased demand in the hot, dry conditions contributed to this. Issues and relevant actions undertaken are discussed in Section 6.6.

Security of water supply will be addressed by several projects, as discussed in Section 6.7. A major development in supply security is the augmentation of Grahamstown Dam, planned for commencement in 2004. Current supply security initiatives include the Tomago Borefields and Anna Bay Sand Bed controlled extractions. The need to reassess the efficiency of the current disinfection process has also been identified as an issue for future water supply security. Hunter Water comfortably achieved full compliance with NHMRC/ ARMCANZ Drinking Water Quality Guidelines.

Actions relevant to Hunter Water in the Memoranda of Understanding with the NSW Department of Health and Department of Land and Water Conservation were met with full compliance. Similarly, Hunter Water complied with all of the actions applicable to the audit period of the Water Management Licence and Dam Safety Act. Although one action required under the Dam Safety Act was outstanding at the end of the audit period, it was completed by 12 July 2001(see Section 6.12).

6.2 Water Quality

Water quality is the most critical performance standard, as it has direct impacts on safeguarding public health. Water quality is measured by most water authorities in Australia, including HWC, against guidelines published by National Health and Medical Research Council (NHMRC) and Agricultural and Resource Management Council of Australia and New Zealand (ARMCANZ).

6.2.1 Requirement and Compliance

Clause 4.1a and Schedule 3, parts 1 to 10 of the Operating Licence require:	Compliance
<p>Compliance with Draft 1994 NHMRC/ARMCANZ guidelines</p> <p>Compliance with Health and Aesthetic parameters of the 1996 NHMRC/ARMCANZ Australian Drinking Water Guidelines (voluntarily agreed to by HWC).</p>	✓

Compliance for water quality must be achieved separately for each of the Corporation's geographical areas (Central, Southern and Northern Regions) as well as the Corporation as a whole.

6.2.2 Microbiological Water quality

Microbiological water quality is assessed through testing for indicator micro-organisms. In 2000/01, HWC complied with the requirements as detailed in the table below.

Standard	Licence Target (lower limit)	Performance 2000/01
Total Coliform	95%	98.6%
Faecal Coliform	98%	99.7%

Hunter Water's performance indicates that the Licence requirements have been complied with during the year on both a regional basis as well as the Corporation as a whole. The results for the Central Region have been consistently good, achieving almost 100% compliance. The total coliform counts in Southern and Northern Regions appear to deteriorate during the warmer months, but are still well above the licence requirements.

This may relate to the fact that the Southern and Northern regions are remote from the treatment plant and the residual chlorine may decay in long lengths of pipeline (which is required for the purpose of disinfection). Consequently, the coliform counts in the water are increased. Whilst HWC demonstrated compliance with the licence, the

results indicate that further assessment of water quality at the extremities of the system should be undertaken.

Recommendation 1:
HWC should investigate the efficiency of disinfection in remote parts of the system, and develop strategies for improvements, including additional sampling if appropriate.

6.2.3 Chemical/Physical Water Quality

The Licence requires that drinking water to be tested for 12 key parameters and five non-key parameters with results for each being within 1996 NHMRC guidelines.

For 12 key parameters HWC must achieve compliance against the guideline in each of the three geographic regions and for the Corporation as a whole.

For the five non-key parameters compliance is required on a Corporation wide basis.

6.3 McClellan Inquiry / Cryptosporidium and Giardia

6.3.1 Introduction

The McClellan Inquiry was conducted in 1998 following the Sydney water contamination incidents in that year. The incidents related to detected levels of cryptosporidium and giardia organisms.

Commissioner McClellan made recommendations relating to catchment protection and risk assessment and reduction in water supplies, as well as education and awareness of the community.

6.3.2 Requirement and Compliance

The Minister for Energy in a letter to HWC of 12 December 2000 requires:	Compliance
“With respect to the recommendations arising from the McClellan Inquiry into the Sydney Water contamination incidents,.... I trust that Hunter Water will continue to progress these initiatives.”	✓

Recommendation 6 of the 1999/00 operational audit requires:	Compliance
Drinking water notification protocols should continue to be reviewed periodically in consultation with the Hunter Area Health Unit to ensure that any progress in the setting of standards (either nationally or internationally) is taken into account in the reporting protocols.	✓
Recommendation 15 of the 1999/00 operational audit requires:	
Review on an annual basis the feasibility of developing a real-time warning system for particles (including protozoa), as industry knowledge advances on this subject.	✓

6.3.3 Discussion

Minister's requirement

HWC has continued to progress the recommendations of the McClellan inquiry. The actions by HWC that are relevant to its operations include:

- Development of an incident management plan.
- Staff training.
- Revised MoU with Department of Health.
- Development of notification procedures.
- Catchment protection. There are issues relating to urban development in the catchment of Campvale Canal – this is addressed in Section 6.4.2 on page 24.

Recommendation 6 from 1999/00 audit

Notification protocols are reviewed and discussed in quarterly meetings with the Hunter Area Health Unit.

To date no change to notification protocols has been required.

Recommendation 15 from 1999/00 audit

The feasibility of using particle count for real time warning system has been reviewed with Hunter Area Health Unit.

HWC carried out pilot plant testing of cryptosporidium removal, with the following outcomes:

- The plant testing has shown that very effective removal of cryptosporidium (generally better than 99.9%) can be achieved with the Hunter Water's current configuration at both Grahamstown and Dungog Water Treatment Plants.

- Particle counters were attached to the real plant and the pilot plant to correlate the particle removal rates in the two plants. The results showed that the particle removal efficiency is a conservative measure of cryptosporidium removal. Based on these results, HWC developed the following testing regime:
 - Testing treated water for cryptosporidium is carried out if counts in the raw water exceeded 10 oocysts per 100 litres.
 - If a positive result is obtained in the raw water and particle removal efficiency recorded at the time was less than 95% then the treated water is also to be tested for cryptosporidium.

The pilot plant also showed that the risk of particle break-through is higher when the filter has been brought back on-line after backwashing, and when a sudden flow change through the filters occurs. Therefore, to mitigate such break-through, the following procedures are followed during filter operation:

- To minimise the risk of breakthrough, only one filter is brought back on line at a time after backwashing.
- To minimise sudden flow changes on the filters, pumping, especially from the Grahamstown Water Treatment Plant has been modified to minimise step changes that occur with different pumping patterns.

The auditors conclude that HWC has adopted a real-time warning system to minimise the risk of particles (including protozoa) reaching the water supply.

6.4 Catchment Protection

6.4.1 Requirement and Compliance

The Minister for Energy in a letter to HWC of 12 December 2000 requires:	Compliance
<p>... “the detection of possible protozoa contamination in raw water at Dungog highlights the need for prudent management of the water catchments and distribution system.</p> <p>In view of this, I require Hunter Water to provide a report on its water quality management and improvement program by 29 June 2001.”</p>	✓

6.4.2 Discussion

Hunter Water has developed a Water Quality Management and Improvement Program report that was sent to the Minister together with a covering letter dated 29 June 2001.

This report sets out three main areas as discussed below:

Overall Management Strategy to Guarantee the Safety of Water Supply

Hunter Water has taken a number of steps aimed at improving the services they provide to their customers in terms of water supply. The management strategy is to reduce the risk to the safety of the water supply and improve the management of the water supply system. This has involved the implementation of two major actions:

- secure alternative water supplies within the catchment to meet demand; and
- formation of a multi-barrier approach incorporated into Hunter Water's strategy to safeguarding the water supplies.

The availability of alternative water supplies has been a major target. The development of substitute sources within the catchment for use in the event of contamination has been a key advancement for the security of potable water supply. The capacity of the Tomago Borefields, regarded as a secure source, has been increased over the past two years. This is one of a range of augmentation options Hunter Water is currently following up on to secure water supply within the catchment.

Water Quality Improvement Initiatives

The primary strategy implemented by Hunter Water to ensure water quality is the utilisation of a defensive set of barriers, aimed at reducing the types and amounts of contaminants that may enter catchment areas and water supply.

The multi-barrier approach works to ensure that contamination of water supplies can be prevented on a number of levels, rather than relying solely on water quality testing. HWC employs three Rangers, who regulate activities within catchment areas, specifically those which may affect water quality.

The recently adopted program of reservoir roofing is a major step towards maintaining high quality water. The majority of barriers utilised by this approach were already in place before the roofing program was adopted.

All water sources have adequate barriers against contamination.

Although most catchment areas within the Hunter Water area contain very little human activity, Campvale Canal, in the Grahamstown Dam catchment, contains urban development. Hunter Water has taken steps to reduce the risk of contamination by providing a reticulated sewerage system in Medowie at cost of \$4.5 million, which was commissioned in 2001. To date all tests have shown that the water quality of Campvale Canal is safe to pump into Grahamstown. However, the catchment is considered high risk due to the presence of urban development. Further assessment of the affects of urban development within this catchment on water quality would assist in the identification of possible sources of contamination.

Hunter Water is also currently reviewing chlorination of water supplies, quality assurance/ accreditation of treatment plants, and is in the process of augmenting Grahamstown to provide improved supply and quality of water. Aeration initiatives at Chichester Dam aim to provide increased quality of raw water.

Recommendation 2:

The presence of urban development within the catchment is a potential risk to water quality. Hunter Water should provide a risk management plan for urban development in order to assist the assessment of the costs and benefits of any further steps to reduce these risks.

Planning for the Future

A number of key planning issues identified by Hunter Water include health issues and changing standards for water quality.

Health issues raised as a result of current treatment processes using chemicals are being targeted in Hunter Water's management strategy. Major issues are those associated with by-products formed by the use of chemicals used during disinfection, such as chlorine, and are currently being investigated. Hunter Water aims to reduce the concentration of these by-products by utilising additional technologies, such as roofing the distribution system. Other water quality parameters under investigation include protozoa presence (such as giardia and cryptosporidium), and aluminium content.

Hunter Water routinely assesses the demands placed on existing infrastructure by the expanding catchment population on a five year basis. This is to assist with predictive planning for infrastructure upgrades and extensions.

6.5 Service Interruptions

6.5.1 Requirement and Compliance

Schedule 4 of the Operating Licence requires:	Compliance
92% of properties served will not incur discontinuity of water services for more than 5 hours duration annually.	✓

6.5.2 Discussion

This standard is interpreted by HWC as follows:

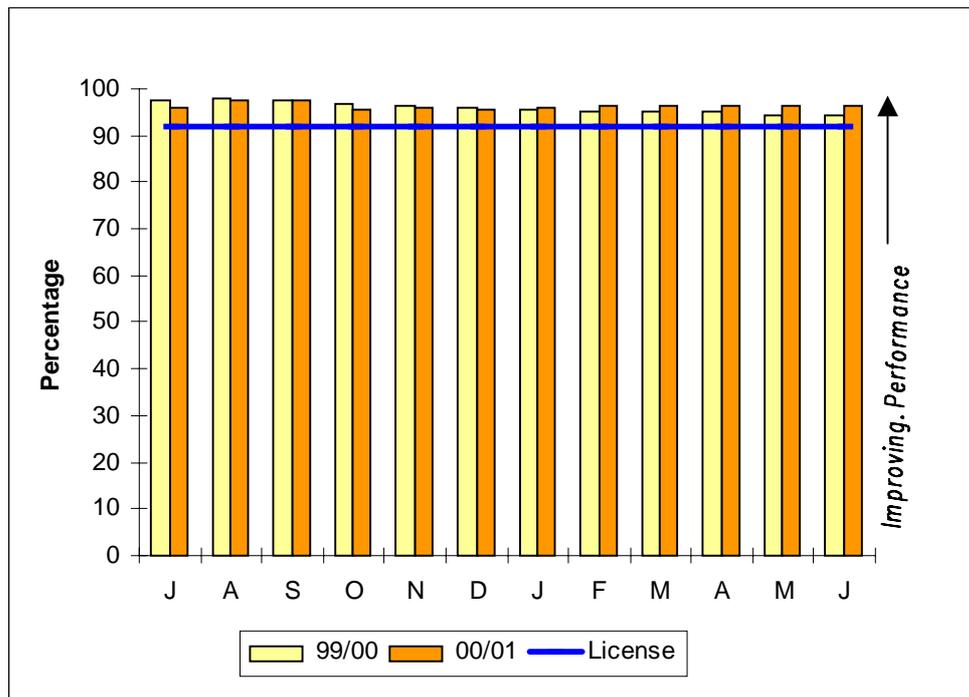
- The total time of interruption per property is calculated by adding all incidents duration throughout the year. That is, a single interruption of five hours is equivalent to five interruptions of one hour.
- The period counted is one financial year (July to June).
- Both planned and unplanned interruptions are included.

The performance during the audit year is listed below.

Standard	Licence Target (lower limit)	Performance 2000/01
Properties not experiencing interruption greater than 5 hours	92%	96.23%

The number of properties subject to interruptions of supply at any one event is estimated by using the geographical information system (GIS). The valves that are shut for the purpose of repairing any system failure are marked on the GIS, which identifies the properties that experience discontinuity of supply. A count of the highlighted properties indicates the number that were subject to discontinuity of supply. Figure 6.1 illustrates Hunter Water's performance for 2000/01.

Figure 6.1: Percentage Of Properties Not Experiencing Interruptions



The duration of interruption is measured from the time the valves are turned off. If the reason for the interruption is a major pipe burst, this may be an under-estimation of the interruption time as it does not take into consideration the duration of interruption between the time of failure and the time when the valves are shut. HWC advised that in the majority of cases pipe bursts do not cause interruption until the valves are turned off by maintenance personnel, and that this measure reflects the true interruption time.

6.6 Water Pressure

6.6.1 Requirement and Compliance

Schedule 4 of the Operating Licence requires:	Compliance
95% of water customers per annum will not experience a verified low pressure incident of less than 20 metres head as measured at the service meter.	✓

6.6.2 Discussion

This standard is interpreted by HWC as follows:

- A verified complaint is one that has been confirmed by a field operator, who measures the pressure at the meter. The measurement is done, if possible, at the same time of the day as indicated by the customer.
- A customer with a verified complaint is counted only once in a financial year, regardless of the number of complaints or the duration of the low pressure.

Based on this interpretation the performance in 2000/01 has been:

Standard	Licence Target (lower limit)	Performance 2000/01
Properties experiencing verified low pressure	95%	97.5%

There is approximately 1,450 customers, or less than 1%, in permanent low pressure areas. HWC advised that the pressure to these customers is 16 metres, and is based on the standard that was adopted to these customers before the Operating Licence was issued. Whilst 16 metre head is considered to be sufficient pressure for most typical households, this has created two classes of customers:

- Permanent low pressure areas where the target pressure is 16 m head;
- Problem low pressure areas, which occur in the Warners Bay area and affect a small minority with target pressure of 16 m head.

Recommendation 3:

1450 customers are supplied with a pressure of 16m, while all other customers are supplied with 20m. Hunter Water should adopt a policy on the permanent lower pressure customers by 30 June 2002.

The Warners Bay lower pressure areas were not identified prior to customer complaints in January 2001. In particular, battle axe properties elevated approximately 10m above street level were experiencing lower pressures. Hunter Water have taken steps to reduce the likelihood of low pressures occurring (details in following paragraphs). The success of these measures will be determined during the next (2001/02) summer. The low pressure count is calculated by adding the verified low pressure complaints during the year to the permanent low (16 m) pressure properties.

Most of the low pressure events are due to system failures such as pipeline breaks. However there are areas which are subject to low pressures due to lack of system capacity during high demand periods. Some of the examples are:

Wallalong

This area experienced low pressures during the summer periods when the demand was high. Some properties in this area were subject to very low pressures (less than 12m required by Customer Charter). This area has been recognised by HWC as a low pressure area since the problem is caused by inadequate system capacity. Hunter Water have advised that both the Mt Kanwary Pump Station and Wallalong Booster will be repaired in preparation for the 2001/02 summer demand. Verification of the system capacity will also be undertaken prior to the summer period.

Warners Bay (Plumridge Close and Chelston Street)

A number of properties in this area experienced long periods of low pressure during periods of extreme demands last summer. Some had no water at all. This problem has been addressed by HWC by installing a booster pump in the Chelston Street area and a new trunk main to supply the Plumridge Close area.

The following areas also experienced low pressure problems for similar reasons, with varying degrees of severity: Lake Road, Balcolyn; Awaba High Level System; Kempwood Close, Adamstown Heights; Eden Street, Bellbird; South Seas Drive, Ashtonfield; Tenambit High Level Zone; Raymond Terrace High Level zone; Whitebread Drive, Lemon Tree Passage; Harris Street, Edgeworth; Ocean Street, Dudley.

Recommendation 4:

Several areas experience low pressure during times of high demand. Hunter Water should monitor the performance of all the problem low pressure areas and report annually about the severity of the problems.

6.7 Security of Water Supply against Drought

6.7.1 Requirement and Compliance

Clause 5.3(a) of the Operating Licence requires:	Compliance
... the licensee shall maintain and provide works sufficient to meet a probable occurrence of drought (requiring the imposition of water restrictions) at no less than 10 yearly intervals.	✓

Drought is defined as when the bulk water held in the special areas (dams) is at 60% or less of available storage.

6.7.2 Discussion

Security against drought

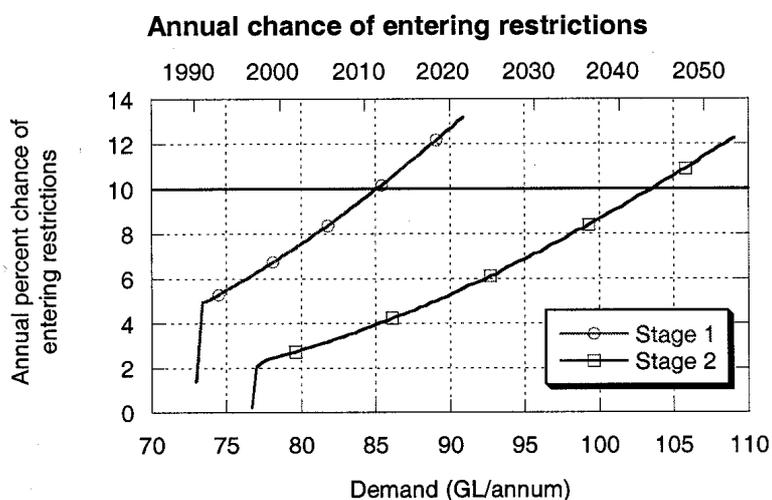
This licence requirement relates to the probability of the storage level in the dams dropping to below 60% of full storage capacity. As the dams are filled by rainfall, the water levels would drop in the case of an extended dry period.

This measure is statistical, based on long term rainfall patterns. The behaviour of the storage is predicted using mathematical modelling and long term time series of rainfall and other climatic conditions.

HWC has established a model that uses historical 70 years of historical rainfall data to generate predictions of rainfall. The model then simulates the behaviour of the storage dams on the basis of rainfall-related inflow and demand-related outflows.

The results of the model are summarised in Figure 6.2, where the drought security is expressed on the vertical axis in terms of probability. That is, a 10 percent probability in any one year equates to a statistical drought every 10 years. The modelling indicates that at the present demand and with Grahamstown Dam at its present state (Stage 1) a drought would occur statistically once in approximately 12 years (8 percent probability). The forecast growth in demand would increase the probability of drought, and it is expected that the 10 year limit would be reached by about 2010.

Figure 6.2: Comparison between the current system (Stage 1) and the augmented system (Stage 2)



Source: Hunter Water Corporation, May 2001

Effect on Customer Service

The security of supply is important as it affects customer service. If a drought situation is encountered, HWC would impose restrictions on customers in order to reduce demand and conserve water.

From the customers' point of view, there are three aspects to restrictions:

- how often they are imposed,
- how long they last, and
- the severity of restrictions (the lower the water reserves get, the more severe the restrictions need to be).

The current standard is considered deficient, as it addresses only the first aspect. Therefore, HWC would still comply with the Licence requirement if it entered drought condition once in 10 years, but imposed restrictions lasting 9 years. This is obviously not acceptable from the customer perspective. The auditors suggest that this requirement be reviewed as part of the Operating Licence review.

Grahamstown Dam Stage 2 Augmentation

Augmentation of Grahamstown Dam spillway (Stage 2), planned to commence in 2004, will increase the dam storage capacity and reduce the probability of drought. With the projected demand, the Stage 2 augmentation would enable HWC to meet this Licence condition until about 2045 (refer to Figure 6.2).

The augmentation involves increasing the storage capacity by about 50%, by increasing the Full Supply Level (FSL) by about 2.5 metres. This is to be achieved by the construction of a major spillway upstream of the

Pacific Highway at Irrawang, a new discharge channel and associated works.

The cost of the works is approximately \$20m.

HWC is implementing the augmentation in stages. Stage 2a, which will increase the storage capacity of the dam by about 15%, is a \$4 million interim stage. Work on Stage 2a has commenced, and is expected to be completed by mid 2002.

Computer model of raw water supply

Overview

Modelling of drought forecasting involves the construction of mathematical models using projections relating to climatic conditions, water quality in Williams River, demand growths, economic situation etc.

Hunter Water has developed a computerised headworks model as a joint effort between Hunter Water and the University of Newcastle in the form of a research project. The headworks model predicts the probability of drought based on historical climatic data and forecast of demand. Typical output of the model is shown in Figure 6.2.

Supply projections

The flow in the rivers and the availability of groundwater in the Tomago aquifer is estimated from extrapolating historical rainfall data. Similarly, water losses through evaporation are estimated from statistical climatic data.

In addition, the nutrient levels in the Williams River is a limiting factor for extracting water from the river. The model includes projections of these levels and the corresponding water extraction regime.

Demand projections

Residential demand projections are based on:

- Population projections using census information and data from the Department of Urban Affairs and Planning (DUAP); and
- Current average domestic demand estimated from the consumption records. No allowance is included in the demand projections for reduction in water demand over time which may result from the implementation of demand management strategies. For further discussion refer to section 6.8 below.

Non-residential demand is difficult to predict, as it is affected significantly by a small number of large users. Hunter Water has included growth for non-residential demand based on current non-residential consumption. In addition an allowance was made for two possible steel mills by multiplying the likely demand by the estimated probability of them proceeding. Therefore, the allowance for Austeel and Protech was based on 10 and 50 percent probability respectively.

Auditors' comment

The auditors have not reviewed the model in detail, as it is considered outside the scope of the audit. The auditors requested Hunter Water to provide details of the review and checking process used to verify the model and the results.

Hunter Water has requested Associate Professor George Kuczera of the University of Newcastle to review and comment on the model. Professor Kuczera has reviewed the model and confirmed by a letter to Hunter Water dated 10 October 2001 that he is satisfied the headworks model is conceptually sound and is using modern approaches. Professor Kuczera also advised that his PhD student, Mr Peter Coombs, has independently developed a headworks model using a different approach. The results (in terms of timing of future augmentation) are similar to those obtained by Hunter Water (as presented in Figure 6.2). Professor Kuczera suggested that Hunter Water revise the demand model in order to improve the model's accuracy.

The auditors are satisfied that, with the proposed augmentation of Grahamstown Dam, compliance with the Operating Licence condition will be achieved in the foreseeable future. The auditors have not commented on the economic justification of the proposed augmentation of Grahamstown Dam. It is understood that such justification will be included in Hunter Water's pricing submission in or around September 2002. In accordance with Recommendation 5 below, the demand projection should reflect HWCs demand management strategy.

Risk

The risk of drought is quantified through the headworks model. However, it is a statistical prediction and it is possible that future climatic conditions would be more severe than predicted, causing extended drought.

It is therefore prudent to have a contingency plan to enable Hunter Water to respond to drought occurring more frequently than statistical predictions.

Hunter Water's contingency plans include :

- Increasing the extraction of groundwater from Tomago sandbeds. The groundwater can be drawn down over a short period to augment the supply from surface water.
- Developing Stockton sand beds. This aquifer is not used by HWC at present.
- Additional pumping to Grahamstown Dam.

As discussed above, the pumping to Grahamstown Dam is limited by nutrient levels in the Williams River. When nutrients concentrations are high, pumping stops to prevent algal growth in the dam. One component of the HWC contingency strategy is extending the period of pumping. HWC has standby activated carbon filters at Grahamstown Water Treatment Plant that can be brought into operation to enable supply of

water from Grahamstown, allowing for deterioration of the water quality at the dam which may result from high nutrient levels.

6.8 Demand Management

6.8.1 Requirement and Compliance

Recommendation 12 of the 1999/00 operational audit requires	Compliance
HWC should continue to develop a strategy for water conservation for its area of operation and encourage the community to achieve reduction in water usage.	N/A
Demand Management predictions for the next 5 years should reflect the water conservation strategy.	N/A

6.8.2 Discussion

Develop strategy

Developing a demand management strategy is also a requirement of the Environmental Management Plan and of the Water Management Licence. The objective of the demand strategy, as specified by the EMP is “*To assist in optimising the construction/ augmentation of sources of water and water transportation systems by continuing the demand management programme*”. HWC established a Demand Management Committee in May 2001, whose role is to coordinate demand management activities in the organisation.

HWC was preparing a demand management strategy that was submitted to DLWC in August 2001, as required by the WML. This was not reviewed by the auditors as it was completed outside the audit period.

Projections to reflect strategy

The next five year projections are based on the current annual residential demand of 210 kL / household. This reflects past water conservation measures, in particular user pays pricing. However, there is no reference to further reduction of demand as a result of future strategies. As the demand management strategy was to be completed beyond the timeframe of the audit, this recommendation should be carried forward to next year’s operational audit.

Recommendation 5:

Demand Management predictions for the next 5 years should reflect the water conservation strategy.

6.9 MoU with NSW Department of Health

An MoU between HWC and the NSW Department of Health (DoH) was established on 1 December 1999. The purpose of the MoU is to outline the roles and responsibilities of the two organisations and to facilitate effective interaction .

A review of HWCs compliance with the MoU was carried out, focusing on the clauses that require action from HWC. The MoU includes 15 actions by HWC. Hunter Water conformed with all relevant actions. Details of the actions and their status are in Appendix E.

6.10 MoU with Department of Land and Water Conservation

An MoU between DLWC and HWC was signed on 7 July 2001 and is effective until 30 June 2002. Under Part 9 of the *Water Act, 1912* (since then this Act has been superseded by the *Water Management Act, 2000*), DLWC has issued HWC with a water management licence to take and use water (Refer to Section 6.11 below). The MoU outlines how both parties will manage water abstraction and the water management licence.

The MoU includes 6 actions by HWC. Hunter Water conformed with all relevant actions. Details of the actions and their status are in Appendix F.

6.11 Water Management Licence

6.11.1 Overview

A 20 year Water Management Licence (WML) was issued by the Water Administration Ministerial Corporation on 26 December 1998 under Part 9 of the *Water Act, 1912*. The WML is administered by DLWC. The licence is for 20 years with 5-yearly reviews. The WML replaces the Water Use Agreement, which forms Schedule 6 of the Operating Licence.

When the relevant sections of the *Water Management Act, 2000* commence, the licence will be converted to a major utility licence under the Act.

The WML allows HWC to take and use water by means of water management works and in accordance with the conditions attached to the licence. Water management works include:

- Chichester Dam;
- Bandon Grove Pipeline Crossing;
- Seaham Weir, Balickera pumping station and associated works;
- Grahamstown Storage; and

- Groundwater Extraction facilities operating in the Special Areas of Tomago, Anna Bay and North Stockton .

6.11.2 Objectives

The purpose of the WML is to regulate the use of water by HWC.

The WML authorises HWC to take and use water through its water management works (pumping stations, dams, boreholes etc). It requires HWC to manage the water resources in accordance with the principles of ecologically sustainable development, and without impacting on third party interests such as other water users.

The main objective of the WML is therefore to protect the environment and the sustainability of water resources. While it places restrictions on HWC operations in the short term, the WML ensures the viability of the water resources in the long term.

6.11.3 Conformance

The WML includes 29 actions that Hunter Water is responsible for. HWC complied with all actions applicable for the audit period. Details are summarised in Appendix G.

6.12 Dam Safety Act

6.12.1 Introduction

The NSW Dams Safety Committee, which was established in accordance with the *Dams Safety Act 1978*, is the statutory authority charged with safety of prescribed dams.

Under the Act, the Committee classifies dams according to the consequence of failure with respect to loss of life, social and environmental impact.

Under this classification system, both Grahamstown and Chichester Dams are High Hazard dams. It is noted that this classification is not an indication of the risk of failure, merely the consequence of failure.

Surveillance reports for dams in this classification are required to be submitted to the Committee at intervals not exceeding five years. Surveillance reports for both Grahamstown and Chichester Dams were submitted to the Dam Safety Committee in July 1998.

6.12.2 Requirement and Compliance

The Minister for Energy in a letter to HWC of 12 December 2000 requires:	Compliance
The current Audit Report identifies a number of outstanding action items arising from the Dams Safety Committee Report for both Grahamstown and Chichester Dams. ... I require the Corporation to address these outstanding recommendations as a matter of urgency	✓

6.12.3 Discussion

From a comprehensive five year review of Dam safety for the HWC's dams, an action list was prepared. At the time of the last Operational audit four actions were outstanding.

The four actions and their current status is as follows:

	HWC Actions Required	Comments	Status
1	Checking the spillway tendons at Chichester Dam.	Work completed – tendon stresses in line with normal range and previous inspections.	Complete
2	Inspection of Campvale Culvert.	Inspection has been delayed due to high water level in the Dam which makes access impossible. HWC is currently examining other techniques to allow assessment of the culvert under similar conditions.	Outstanding on 30 June 2001. HWC advised that CCTV inspection was carried out on 12 July 2001.
3	State Emergency Services (SES) to initiate a community meeting with households at risk from dam failure downstream of Chichester Dam. Hunter Water Corporation to provide technical assistance to SES.	This meeting has not taken place. HWC has written to the SES requesting that the matter be expedited.	N/A

4	Hunter Water to develop a regular maintenance program for radios installed for Chichester Dam.	This is an ongoing item. The intention was that a maintenance program will be discussed in a meeting with SES and residents (refer Action 3 above). Since the meeting did not take place, HWC carried out routine maintenance inspection of each radio in April.	✓
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There are two actions that have not been completed.

With respect to the inspection of Campvale Culvert, Hunter Water advised that an inspection was carried out on 12 July 2001 by a remotely controlled CCTV. A verbal report was provided to the Dams Safety Committee on the outcome of the inspection.

Recommendation 6:

Hunter Water to provide a formal report to the Dam Safety Committee on the outcome of the inspection of Campvale Culvert by 31 December 2001

With respect to the meeting with the community downstream of Chichester Dam, the auditors acknowledge that the action for initiating the meeting is the responsibility of SES. However, as the dam owner, Hunter Water has an interest in proceeding with the meeting, and it should take action to ensure that the meeting is held.

Recommendation 7:

Hunter Water should communicate with SES, and ensure that a meeting with the community downstream of Chichester Dam is held no later than 29 February 2002

6.12.4 Stakeholder Consultation

The Dam Safety Committee responded to the auditors' letter requesting comments. In its response the Committee commented:

The Committee advises that Hunter Water Corporation shows a continued commitment to complying with all Committee requirements under the Dams Safety Act, 1978.

6.13 Hunter Water Corporation Limited (Special Areas) Regulation 1997

The *HWC Limited (Special Areas) Regulation 1997*, under the *Hunter Water Act 1991* aims to provide HWC with a framework with which to maintain specific areas (Special Areas) within the Corporation's catchment. The Special Areas referred to by the Regulation are defined in Schedules 1-5 of the Regulation. These designated Special Areas all form part of HWC's water supply catchment. DLWC is the governing body, with HWC holding some authority in the Chichester and Grahamstown Dam areas.

The Regulation protects sensitive or important areas within the HWC catchment against harm from a number of anthropogenic sources. It's provisions include prohibition of agricultural uses and developments within 30m of any water body within Special Areas and the prohibition of watercraft and access in specified areas.

The management of Special Areas is regulated by DLWC through the submission of annual reports from Corporation Rangers employed by HWC.

Development may occur within catchment areas after the approval of a development application lodged with the relevant governing body. In some cases some form of Environmental Impact Assessment such as a Statement of Environmental Effects or an Environmental Impact Statement may be required as a condition of development approval. Hunter Water has given no evidence to indicate that action is required on their part with respect to the control of development within the catchment area.

6.14 Factors Affecting Performance 2000/01

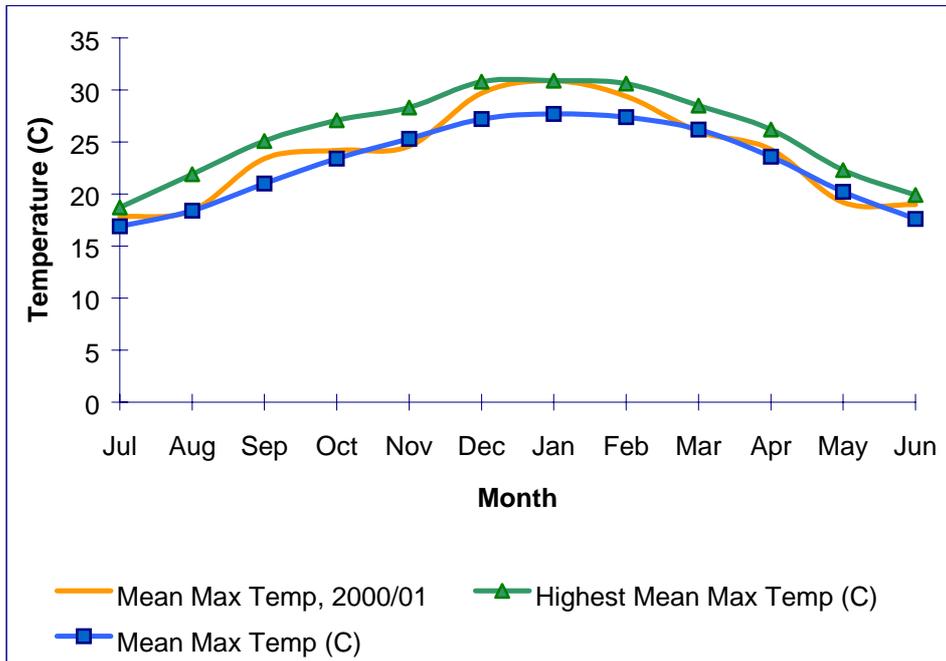
6.14.1 Weather

One of the factors that affects the performance of the water supply system is the weather. The impacts of the weather are:

- Dry and hot weather increases the demand for water.
- Drought has impact on the security of supply.

2000/2001 was characterised by a very hot summer which affected Hunter Water's performance by impacting water pressure and demand. This is illustrated in the following figure which describes the mean daily maximum temperature. The figure compares the mean daily maximum temperature in 2000/2001 with historical data since 1942. As can be seen from the graph, the mean maximum temperature in 2000/01 was generally above the long term mean, with the temperature in December 2000/January 2001 reaching an all time high.

Figure 6.3: Comparison of Temperature Variations 2000/01 with Highest and Mean Recordings, Williamstown Stn 61078



Consistent with this weather pattern, Hunter Water advised that in December/January of the audit year, it has experienced 9 of the 15 highest daily demands of the last decade.

Hunter Water consider that maintaining the system in order for it to cope with extreme conditions may not be cost effective. HWC has suggested that a three year rolling average for most standards would even out the high and low extremes. This suggestion should be considered as part of the Licence review.

6.14.2 Water pressure

In 2000/01, 97.5% of properties did not experience verified low pressure, against a Licence standard of 95%. In the previous year, the performance had been 98.6%.

This measure is skewed by the presence of the 1447 properties on permanent low pressure areas.

While complying with the Licence standard, the performance in 2000/2001 is worse than in the previous year, as shown in the table below:

Complaint	2000/01	1999/00
Verified low pressure complaints (excluding the 1447 low pressure properties)	154	4
Complaints which did not lead to verified low pressure	712	516

The reason for the deterioration is a major low pressure incident in December / January, and a few service areas that are suffering from the development and extension to the system, as discussed in Section 6.6.2.

6.14.3 Water quality

The performance in 2000/01 has been identical to the performance in the previous year with respect to faecal coliform. With respect to total coliform, the performance in 2000/01 was 98.6% of samples clear of total coliform, while the performance in the previous year had been 99.2%. As the Licence target is 95% for this parameters, HWC achieved results well above the standard.

The auditors do not consider this difference to be significant. The reasons for the difference have not been identified, though they may be related to the hot summer when the effectiveness of the disinfection process is reduced. This issue is discussed in Section 6.2.2 of the report.

6.14.4 Service discontinuities

Despite the hot summer and high demand, Hunter Water achieved good performance on this indicator in 2000/01, with 96.2% of properties not experiencing interruptions of more than 5 hours (against target of 92%). In the previous year this indicator was 94.3%.

The budget expenditure for asset replacement and augmentation (affecting both discontinuities and pressure) was \$2.4 million in 2000/01.

No one reason has been identified for the improved performance. In general, it reflects HWC expenditure on asset replacement and quick response to interruptions.

In order to make inferences about the factors affecting this aspect of performance, additional statistics needs to be collected and correlated against the performance.

6.14.5 Security of supply against drought

The security of supply has been declining with the growth of demand in the service area of Hunter Water. However, this is a statistical measure and despite the hot summer, the year had sufficient rainfall to provide for the demand and maintain high levels in supply dams.

At the end of the year all storages were at full or near full level.

7 Wastewater

7.1 Overview

This section covers the collection and treatment of wastewater, the second element in water cycle management. In addition, HWC activities relating to stormwater are addressed in this section. Hunter Water complied with the Operating Licence requirements.

Hunter Water had 14 Licences for wastewater treatment works, at the end of the audit period. Decommissioning of several WWTWs during the audit period took place under the continued implementation of the Hunter Sewerage Project. Compliance with EPA discharge standards was achieved during the audit period, with only a few minor breaches, discussed in Section 7.2.2. The nature of these breaches were mainly administrative due to changes in Licences. There was no environmental impact associated with the breaches.

Hunter Water's performance with respect to sewer surcharges has been continually improving over the past few years. This has been achieved through a combination of both pipe replacement and maintenance. An indicator of the performance of the sewerage systems is the number of properties affected by sewer surcharges. Although slightly up from the previous audit periods' rates, Hunter Water have achieved compliance with the performance standard (refer to Figure 7.2). Overall performance was affected during the audit period by extreme weather conditions. Heavy rains in May contributed to sewer overflows due to infiltration and inflow.

Hunter Water owns and operates some of the major stormwater channels within its designated area of operation, however most of the stormwater assets are owned and operated by the local councils. The operation of these channels is not addressed in the Operating Licence. The wet weather performance of the sewerage system may be affected by the stormwater system. However, the stormwater assets owned and operated by Hunter Water do not have major impacts upon sewerage performance. Hunter Water has undertaken a number of projects to improve the water quality in the stormwater system, as detailed in Section 7.5.2.

Hunter Water achieved compliance with all five actions required by the Memoranda of Understanding with the EPA. Full details are given in Appendix I.

7.2 Wastewater Treatment Works

7.2.1 Requirements and Compliance

Schedule 4 of the Operating Licence requires:	Compliance
Discharges from the wastewater treatment works of the Licensee (HWC) shall meet the discharge standards set by the licences issued by the Environment Protection Authority in respect of these works.	✓ (Some minor breaches of conditions, refer below)
Recommendation 7 of the 1999/00 operational audit requires:	
Plans of maintenance for wastewater treatment works take into account the sourcing of the spare parts and expertise required to meet the special needs of each plant, to achieve an improved level of preparedness for contingency.	✓

7.2.2 Discussion

Period covered by the audit

The EPA licences issued annually, and the conditions set therein need to be complied with on an annual basis.

Each licence is valid for a period of 12 months, however, for administrative reasons, the start date of the licences is staggered with four different start dates.

The audit therefore covers the operation of each treatment plant for the 12 months prior to the expiration of its licence.

The periods covered by the audit are shown in the list below:

Period covered	WWTWs
12 months to 1 July 2001	‡Belmont, Boulder Bay, ¥Burwood Beach, Stockton, ‡Edgeworth, ¥Shortland, ‡Toronto, * ‡Windale.
12 months to 1 April 2001	Dora Creek, Kearsley, Paxton.
12 months to 1 January 2001	Cessnock, Kurri Kurri, Morpeth.
12 months to 1 October 2000	*Bolwarra, Branxton, Farley, *Minmi, Tanilba Bay, Raymond Terrace.

* These facilities have been decommissioned and their flows redirected since the audit period, leaving 17 WWTWs operational.

‡ These facilities share Licence Number 1771.

¥ These facilities share Licence Number 1683.

Discharges from WWTW

Hunter Water operated 20 wastewater treatment works during the audit period. The discharge from the WWTWs is controlled by annual licences issued by the EPA.

During the audit period, the combined requirements of the initial 16 licences (distributed as shown in the above table) amount to more than 25,000 conditions. At 1 July, 2001, Hunter Water was operating 17 treatment plants under 14 licences.

The auditors take the view that the critical requirements of the licences are the effluent discharge criteria, or quality limits. These are expressed as maximum concentrations of certain pollutants for the 50th percentile and 90th percentile of the samples. In the audit period, HWC complied with these requirements. The auditors conclude that Hunter Water generally demonstrated compliance with the EPA licences.

There have been minor breaches of other licence conditions in seven WWTWs. With the exception of two, these have been of an administrative nature. HWC reports that in all cases there has been no impact on the quality of effluent discharged from the plants.

A detailed summary of the compliance for each WWTW is provided in Appendix H. Hunter Water has a system in place for assessing environmental incidents under the Environmental Management System where it is considered that the breach has caused an impact. The auditors consider that a consistent and rigorous assessment should be adopted for all breaches.

In 2000/01 the type of licence for the WWTW was changed, with the transition from the *Pollution Control Act (1970)* to the *Protection of the Environment Operations Act (1999)*. Some of the non compliances were administrative in relation to the changed licences.

The auditor's conclusion is that non compliances have mostly been minor in nature, and have had no significant environmental impact. The performance of HWC is considered satisfactory.

The auditor notes, however, that many of the non compliances relate to transitional arrangements, including the transition to the new licence and the transition from the old works to the new works at Morpeth.

Recommendation 8:

HWC should prepare plans for transitions and change overs well in advance, with a focus on meeting licence conditions

Plans of maintenance

HWC has prepared plans of maintenance as per the recommendations of the 1999/00 audit.

A report titled *Identification of Critical Process Components & Development of Contingency Plans for Hunter Water Corporation Wastewater Treatment Works* was completed in June 2001.

7.3 Sewer Surcharges

7.3.1 Requirement and Compliance

Schedule 4 of the Operating Licence requires two operational standards for sewer discharges:	Compliance
Reported sewer surcharges will occur at no more than 1.4 incidents per kilometre of main per annum.	✓
96% of customers per annum will not experience a sewage overflow on their property from Hunter Water's sewer.	✓

7.3.2 Discussion

What are sewer surcharges?

Sewer surcharges occur when wastewater is discharged from the sewerage system to the surface. The causes are

- Interruption to the flow due to pipe blockage. These are caused mainly by tree roots entering the pipes.
- Insufficient capacity in the sewers to accommodate the flow, usually when the flow increases due to wet weather. The increased flow is a result of infiltration of groundwater into the pipe system and inflow of surface water into access chambers and through illegal connections of roof drains.
- A combination of the above two causes. This can happen as a result of partial blockage of the pipe, which causes surcharges in wet weather only.

Surcharges occur in mains and branches, typically through access chambers, and in shafts, which are part of the customers' private sewerage connection.

Infiltration and inflow of rainwater into sewers and access chambers affects the wet weather performance of the system. The quantity of rainfall therefore affects the performance of the system. The high rainfall in March-May 2001 (refer to Figure 7.3) resulted in these three months having higher than average surcharges, with the highest number of surcharges for the year occurring in May (667 surcharges, with 287 storm surcharges). An inadequate stormwater system can increase the stormwater inflow, and consequently the surcharges, by causing local flooding and encouraging illegal connections. The local drains that affect the performance of the sewerage system are generally under the control of the local council and not Hunter Water. For further discussion of the stormwater system refer to Section 7.5.

HWC Performance

HWC performance with respect to sewer surcharges has been improving over the last few years. Figures 7.1 and 7.2 illustrate Hunter Water's performance in 2000/01.

Standard	Requirement (upper limit)	Performance
Surcharges per km of main	1.4	1.04
Sewage overflow on customer property	4%	1.4%

Assessment

HWC complied with the licence requirements. Over the last few years the performance has improved through a combination of maintenance and pipe replacement.

The improved performance evident from the graphs had required additional expenditure on operations and maintenance, as well as on capital improvements.

Figure 7.1: Sewer Surcharges per Kilometre of Pipe (YTD, Annualised)

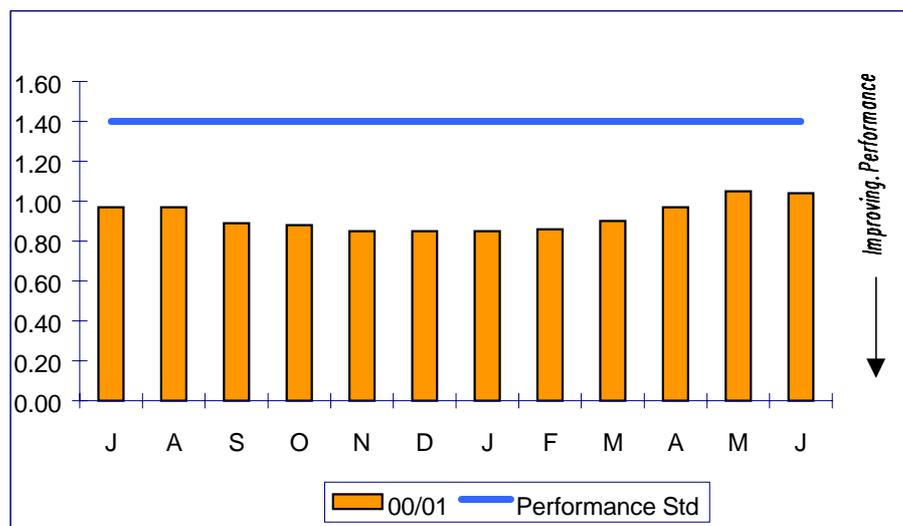
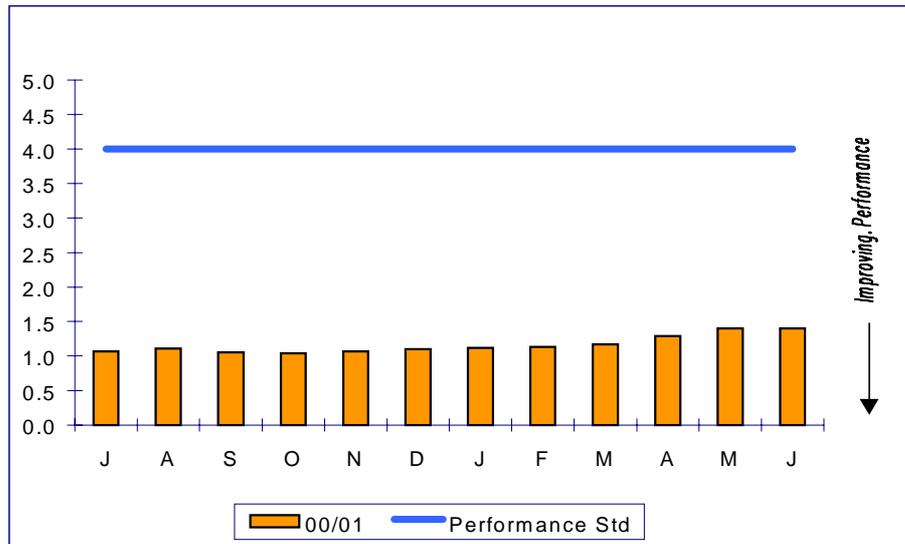


Figure 7.2: Percentage of Properties Affected by Sewer Surcharge (YTD, Annualised)



Assuming that the performance standard is appropriate (refer to discussion below), there can be an argument that the expenditures can be reduced to allow the performance to get closer to the required standard. From discussions with HWC staff, it appears that the corporation is considering this strategy, though it has not been adopted as Corporate policy.

7.4 Comments on Standards

7.4.1 Sewer Surcharges

Purpose of the standard

The standard for sewer discharge is twofold:

- Protect the environment from pollution.
- Protect customers from inconvenience and health risk.

Is the standard appropriate for addressing the purpose?

Yes. Surcharges affect both customers and the environment. The existing standards address both impacts.

Standard definition

Surcharges per km of main

This standard covers both environment protection and customer protection. The following comments are made on this standard:

- The standard does not define the pipes that should be included. HWC is interpreting the standard as including all of HWC sewers, as

well as property shafts, but excluding the customers' private sewer from the shaft to the house. This interpretation is reasonable, even conservative, because the shafts are part of the individual house connection.

- Approximately 20 percent of surcharges occur in shafts. HWC could have adopted a definition that excludes the shafts, and have enabled it to report a considerably better performance.

Effect on properties

This standard relates to customer protection. Its wide definition can compromise customer protection, as discussed below.

- A customer who experiences more than one surcharge in a year is counted only once.
- There is no tracking of, or protection to, customers who are affected by surcharges repeatedly, year after year. Whilst HWC maintains a 12 month rolling register, it does not analyse long term impact (eg, number of times affected in 10 years).
- There is no protection to properties who are not customers of HWC, but may be affected by a Hunter Water sewer.
- There is no protection to customers, or members of the public in general, who may be affected by surcharges onto public property such as footpaths or parks.

This standard is met by HWC comfortably.

7.5 Stormwater Drainage

7.5.1 Stormwater Drainage System

Hunter Water owns and operates some major stormwater channels within part of the designated area of its operations. This function of Hunter Water does not have compliance requirements in the Operating Licence, and thus is outside the scope of this audit. However, at the commencement of the audit IPART requested the auditors to address this part of the operations.

HWC is responsible for the trunk drains (channels, culverts and large pipes) in Newcastle, part of Cessnock and a very small component of Lake Macquarie. It does not operate the stormwater system in Maitland or Port Stephens. The smaller pipes that drain to HWC's stormwater system are owned and operated by the local councils.

Hunter Water's strategy is to maintain the structural integrity and existing capacity of the assets. The maintenance budget for the stormwater drainage system is around \$400,000 pa, and the anticipated capital works is estimated at \$1.1 million over the next 3 years.

In terms of flood protection, the drains generally have the capacity to contain a 1:20 year flood. There is little opportunity to increase the

capacity through the construction of larger channels, detention basins, etc. due to the highly developed urban areas in which they are located.

Water quality is maintained through gross pollutant traps, booms and berms. Reduction of other contaminants, such as nutrients, is not undertaken in all systems but sedimentation traps in Newcastle and Lake Macquarie do result in some nutrient removal. HWC advised that nutrient removal is best addressed at the source, through community education.

The main issue of management of stormwater in the major metropolitan areas in NSW, including the Hunter, is the interaction between the various authorities, including local councils, HWC, DLWC and EPA.

Institutional reform will be necessary to address this issue. Stormwater drainage is one of the objectives of the EMP, and is addressed in Section 8.5.

7.5.2 Interaction with Sewerage System

Stormwater drainage and sewerage systems are linked and impact on each other, as described below.

- Inadequate stormwater drainage system is one of the factors that can increase the inflow of stormwater into the sewerage systems, causing excessive loading which may result in overflows. The inflow is caused by local flooding and ingress of stormwater through manhole covers; and through illegal connections of roof drains to the sewage system.
- Overflows from the sewerage system typically flow into the stormwater system. This would have major effects on water quality of the receiving water, especially during dry weather when there is little dilution of the wastewater.

Hunter Water's stormwater assets are typically large trunk drains and therefore have little direct interaction with the sewerage system.

The above notwithstanding, there are a number of activities that HWC is undertaking in order to reduce the stormwater-wastewater impacts. These include:

- computer modeling of the sewerage system to identify system constraints (refer to section 8.5);
- replacing manhole covers to prevent surface water from entering the sewerage system;
- upgrading several elements of the sewerage system to control the inflow of stormwater into the sewerage system and reduce the overflows from the sewerage system.

7.6 MoU with EPA

An MoU between the EPA and HWC was signed on 20 July 2000 and is effective until 30 June 2005. The MoU outlines the roles and environmental principals of the two organisations, including HWC's commitment to environmental planning and reporting, and liaison with the community on environmental issues.

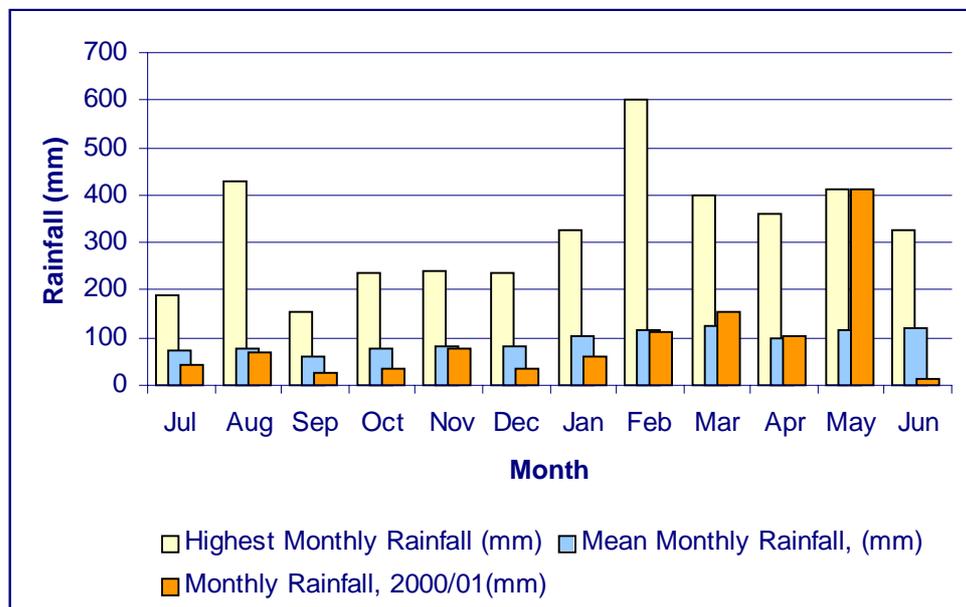
The MoU includes 5 actions by HWC. Hunter Water conformed with all relevant actions. Details of the actions and their status are in Appendix I.

7.7 Factors Affecting Performance 2000/01

7.7.1 Weather

The performance of the system is significantly influenced by yearly variations in climatic conditions. 2000/01 was characterised by a very hot summer and heavy rains in May. Figure 7.3 compares the rainfall in 2000/01 with historical data recorded since 1946. The graph shows that for 10 months the monthly rainfall in 2000/01 was below the long term monthly rainfall. However, the rainfall in May 2001 was the highest on record for May.

Figure 7.3: Comparison of Rainfall 2000/01 with Highest and Mean Recordings, Williamstown Stn 61078



The heavy rains experienced in May contributed to overflows from sewers due to infiltration and inflow. Prolonged dry, hot weather throughout summer also increases the probability of sewer blockage due to roots entering the pipe infrastructure in search of water.

7.7.2 Changes in Operating Environment

The following changes to the operating environment occurred in 2000/2001:

- The change in licences for the WWTWs to licences under *Protection of the Environment Operation Act 1999*.
- The commissioning of the new Morpeth WWTW.
- The signing of MoU with EPA (in July 2000).

The impacts are discussed below.

Changes in EPA Licences

The new EPA licensing system, under the POEO Act, is a system licence, which is different from the previous licences that only covered the WWTWs. These licences also have the power to regulate surcharges from the sewerage system. However, at this stage the EPA has not imposed conditions on the reticulation system and the changes to the licence have been administrative only, including load based licensing fees.

As discussed in Section 7.1, some administrative non compliances occurred because of these changes.

Commissioning of Morpeth

As discussed in Section 7.1, some incidents, planned and unplanned, occurred as part of the transition from the old plant to the new plant.

MoU with EPA

This has not affected the operation, as most of the actions required by the MoU have already been in progress.

7.7.3 Wastewater Treatment Plants

The performance has been good. Some incidents and the factors causing them are discussed in Section 7.2.2.

7.7.4 Sewer overflows

Hunter Water achieved the licence standard for sewer overflows in 2000/01. However, the performance has been slightly lower than in the previous year. With respect to sewer surcharges per km of main, HWC has improved its performance over the last 5 years, until in 1999/2000 it achieved a 0.92 surcharges, against a target of 1.4. In 2000/01 the performance was 1.04 surcharges.

It appears to the auditors that Hunter Water considers the standard of 1.4 surcharges per km as adequate. For this reason, it is adopting a strategy which is not pursuant of further reduction in this standard.

8 Environmental Management Plan

8.1 Overview

The Operational Audit Terms of Reference (Schedule 5) and sub-clause 8.5 of the Operating Licence requires the assessment of and reporting on the performance and progress of the Corporation in relation to its Environmental Plan. The EMP contains 85 actions, 84 of which were complied with during the audit period. Full compliance details are addressed in Appendix J.

Hunter Water has developed an Environmental Management System (EMS) generally in accordance with the ISO 14000 series of standards. The Environmental Management Plan (EMP) is one of the most critical components of the EMS. The EMP contains specific objectives, targets and actions that Hunter Water needs to address to achieve its business objectives associated with environmental management and comply with its Environmental Policy.

The EMP is required to ensure that:

- Environmental programs and action plans are closely monitored and reviewed to ensure they remain relevant to the Corporation's changing needs and objectives,
- Hunter Water's environmental performance associated with all its activities is regularly assessed and reported on,
- Hunter Water complies with environmental legislation and environmental objectives by enhancing environmental auditing within the Corporation.

The Objectives and Actions of the EMP relate to the core activities of Hunter Water:

- 1.0 Water Resources
- 2.0 Wastewater
- 3.0 Community Consultation
- 4.0 Stormwater
- 5.0 Corporate Responsibility

Overriding Objectives have been developed for each core activity with sub-objectives for each major component. Specific actions have been developed for each objective. The objectives and actions of the 2000/2001 EMP are the subject of this Operational Audit.

The EMP is revised annually to ensure that it represents the operating activities and environmental objectives of the Corporation.

8.2 Summary of Compliance

The EMP contains 85 Actions. HWC conformed with 84 of these actions. A summary of the EMP requirements and HWC activities is given below with details provided in Appendix J.

8.2.1 General Requirements

Each manager responsible for components of the EMP is to revise the EMP annually in consultation with the Manager Environmental Policy (May).

Each manager responsible for the Regulatory Monitor is to revise the monitor annually in accordance with the revised EMP (June).

Recommendation 9 of the 1999/00 operational audit requires:	Compliance
...where possible and appropriate, the next review of the EMP objectives for HWC includes measurable performance standards to provide auditable outcomes for the objectives / sub-objectives.	N/A

Compliance Status

The EMP was updated in July 2001 and each manager has revised the monitor in accordance with the revised EMP.

Many of the objectives in the 2000/2001 EMP do not have measurable outcomes or performance standards. This EMP was prepared prior to completion of the 1999/2000 operational audit, and therefore cannot reflect its recommendations.

Recommendation 9:

The introduction by HWC of measurable performance standards into the 2001/2002 EMP should be assessed in the 2001/2002 Audit.

Discussion

A number of changes have been made to the EMP to make it more accessible to the general public and provide targets associated with the environmental objectives. These changes are included in the 2001/2002 EMP.

The EMP is designed to be a medium term (5 year) plan for environmental performance. Many of the actions are either ongoing annual or biennial or have a short term focus (1 year). There is an opportunity for Hunter Water to develop more medium or long term objectives (such as the targets for reuse of effluent and biosolids), and prepare a 3-5 year plan for the performance standards that the Corporation includes in the EMP.

Recommendation 10:

Hunter Water should develop further medium – long term measurable objectives for inclusion in the EMP.

8.2.2 Objective 1.0 - Water Resources

Overriding Objective

To harvest, treat and provide a safe supply of water, with least environmental impact, at reasonable cost to the community.

Sub-Objectives

Five sub-objectives have been identified to achieve this overriding objective:

- 1.1 Catchment Management
- 1.2 Raw Water Quality
- 1.3 Water Treatment and Transportation
- 1.4 Research
- 1.5 Demand Management

Recommendation 11:

In accordance with the overriding objective, Hunter Water should develop a method of representing the “cost to the community” and relate this to the actions relating to water resources.

8.2.3 Sub-Objective 1.1 - Catchment Management

To play a supporting role in TCM in the Corporation’s area of operations and to continue to work closely with the Hunter Catchment Management Trust and Department of Land and Water Conservation and Local Councils.

Status

Hunter Water has complied with all actions relating to Catchment Management. Further information is included in Appendix J.

Discussion

Hunter Water has continued to support total catchment management initiatives and groups including providing research and financial support. Land management procedures (Property Plans for lessees) incorporate best management practices as required. The Corporation’s Rangers are active and provide support to the Catchment Management Committees (CMCs) and DLWC. Most of the relevant recommendations of the Williams River Enquiry have been completed by Hunter Water.

Recommendation 12:

Most of the relevant recommendations of the Williams River Enquiry have been completed by Hunter Water. The EMP should be updated to reflect this and provide a long term outlook for management of the catchment.

Recommendation 13:

Specific requirements of the Water Management Licence which relate to the Corporation's objectives in environmental management should be developed into medium-long term actions in the EMP.

8.2.4 Sub-Objective 1.2 - Raw Water Quality

To monitor water sources to assess trends in raw water quality.

Status

Hunter Water has complied with all actions relating to Raw Water Quality. Further information is included in Appendix J.

Discussion

Hunter Water continues to work closely with other agencies in relation to raw water quality. The Corporation monitors trends in raw water quality and the adequacy of the testing programs for early identification of catchment issues and to provide information to water treatment personnel.

Access to Raw Water Data

Recommendation 10 from the 1999/00 operational audit requires:	Compliance
Ensure that the problems associated with electronic access to Raw Water Data by DLWC are resolved.	✓

Compliance

The problems associated with access to raw water data have been resolved.

Discussion

HWC maintains a computer system which DLWC has electronic access to for the retrieval of raw water data.

HWC reports that that DLWC personnel have been trained in the retrieval of data, and that the system is operating smoothly.

8.2.5 Sub-Objective 1.3 - Water Treatment and Transportation

To treat and supply water to customers to a standard which meets all water quality objectives while minimising chemical usage and environmental impact.

Status

Hunter Water has achieved the required actions for water treatment and transportation. Further information is included in Appendix J.

Discussion

HWC monitors sludge quality in accordance with the EPA requirements for waste disposal, regularly audits chemical storage practices, and explores and develops initiatives to improve energy efficiency of the assets.

Recommendation 14:

Where regular (annual/biannual) reviews of programs or strategies are planned, it is recommended that a long term program be developed to assist planning and avoid confusion.

8.2.6 Sub-Objective 1.4 - Research

To carry out applied research associated with water resource management.

Status

Hunter Water has achieved the required actions for Research. Further information is included in Appendix J.

Discussion

Research initiatives are continuing and the Corporation's research needs have been reviewed. In 2000/2001 HWC contributed to research initiatives of the Williams River TCM committee.

Research

Recommendation 11 from the 1999/00 operational audit requires:	Compliance
HWC should continue to participate in and assist relevant groups with research related to the activities and area of interest to HWC.	✓ (ongoing)

Compliance

HWC continues to assist with research opportunities related to HWC activities.

Discussion

Hunter Water is working in partnership with the University of Newcastle and other agencies on five research projects, provides funding for the Chair of Environmental Engineering at the University, provides an annual contribution for research at the University and is a member of the WSAA and CRC for Water Quality and Treatment.

Recommendation 15:

Hunter Water should identify research opportunities which would provide a benefit in terms of commercial, environmental and efficiency improvements for the Corporation and its customers.

8.2.7 Sub-Objective 1.5 – Demand Management

To assist in optimising the construction/augmentation of sources of water and water transportation systems by continuing the demand management program.

Status

Hunter Water has achieved the required actions for Demand Management. Further information is included in Appendix J.

Discussion

Hunter Water is actively encouraging effluent reuse and other demand management initiatives for residential and non-residential customers. The Corporation has further developed feasible effluent reuse opportunities including crop and turf irrigation, industrial reuse, cleaner production initiatives and effluent application on forestry. Water conservation initiatives have included development of environmental demonstration homes. HWC has also undertaken a water conservation campaign for print and radio media and provided assistance to the Master Builders Association and Council for water reduction programs for the residential sector.

Hunter Water has adopted the current figure of 210 kL / household as the long term average target for the “hold residential water consumption” (ie maintain existing per capita rate of consumption) indicator. However, annual variation to the demand makes it difficult to determine the long term average. Hunter Water should develop a climatic model that will enable it to report against this target. The next audit should review progress against the revised indicator.

Recommendation 16:

Hunter Water should develop a climatic model to enable it to assess its long term average against the adopted target of 210 kL per household per annum.

Recommendation 12 of the 1999/2000 operational audit refers to demand management. It is addressed in Section 6.8 on page 35.

8.3 Objective 2.0 – Wastewater

8.3.1 Introduction

Overriding Objective

To collect, transport, treat and dispose of wastewater in a manner which conforms to environmental regulations and the Operating Licence in an environmentally responsible manner.

Sub-objectives

Three sub-objectives have been identified to achieve this overriding objective:

2.1 Trade Waste

2.2 Wastewater Transportation

2.3 Wastewater Treatment

8.3.2 Sub-Objective 2.1 - Trade Waste

To minimise the entry to the sewerage system of all substances which cannot be effectively treated and ensure that Hunter Water adequately protects workers, assets and receiving waters from harmful trade waste substances.

Status

Hunter Water has achieved the required actions for Trade Waste. Further information is included in Appendix J.

Discussion

Hunter Water is active in the management of Trade Waste issues including the assessment of risks, review of permits, the free chemical collection service and investigations into trade waste incidents.

8.3.3 Sub-Objective 2.2 - Wastewater Transportation

To minimise the environmental impact or risk and maximise the efficiency of the wastewater transportation system.

Targets relating to compliance with Operating Licence requirements for surcharges are also included in this Objective.

Recommendation 17:

Hunter Water should include a measure of cost-effectiveness in minimising impacts and maximising efficiencies of the wastewater transportation system.

Status

Hunter Water has achieved all but one of the required actions for Wastewater Transportation. The number of overflows from pumping stations was reported in the Annual Environmental Report but not the type of failures as required by the EMP. Further information is included in Appendix J.

Discussion

The Corporation is continuing the critical sewer inspection program, flow gauging and modelling, odour control strategies, reporting on overflows, energy management initiatives and environmental assessments of the wastewater transportation system.

Wastewater Transportation Modelling

Recommendation 13 of the 1999/00 operational audit requires:	Compliance
Complete the flow modelling of the outstanding HWC sewer systems by December 2001.	N/A

Discussion

The time required to complete this recommendation is outside the time period covered by this audit.

HWC reports that the progress to date is as follows:

Catchment	No. of Sub-Catchment	No of Sub-Catchments completed
Lake Macquarie	6	6
Newcastle Harbour	2	2
Ocean / Coastal	2	2
Port Stephens	2	1
Hunter River	5	3

The target date for completion is December 2001.

This recommendation should be reviewed again in the next operational audit.

Recommendation 18:

Complete the flow modelling of the outstanding HWC sewer systems by December 2001.

8.3.4 Sub-Objective 2.3 - Wastewater Treatment

To provide a quality of treatment which is environmentally acceptable and to seek productive reuse of effluent and biosolids, where environmentally and economically feasible.

Targets relating to public odour complaints (60 per year), effluent reuse (13% of annual dry weather flows by 2005) and reuse of biosolids (90% reuse by 2005) are also included in this Objective.

Status

Hunter Water has achieved the required actions for Wastewater Treatment. Further information is included in Appendix J.

Discussion

The Corporation is making good progress towards the effluent and biosolids reuse targets. The Corporation is currently recycling 10% of annual dry weather flows (towards the target of 13%) and was able to recycle 100% of dewatered biosolids (and stockpiled biosolids) in 2000/2001 due to the establishment of tree plantation trials by State Forests.

Progress is continuing with the Environmental Improvement Plan for inland wastewater treatment plants and the Hunter Sewerage Project. Management of the wastewater treatment activities (including assessment of impact on receiving waters, odour control strategies and the development of energy efficient initiatives) is continuing in accordance with the EMP actions. Stockton sewage flows will be transferred to Shortland WWTW to enable the decommissioning of the Stockton WWTW and outfall by mid-2002.

8.4 Objective 3.0 - Community Consultation**8.4.1 Introduction****Overriding Objective**

To demonstrate a sense of social responsibility by having regard to the interests of the community.

Sub-objective

One sub-objective has been identified to achieve this overriding objective:

3.1 Consultation, Information and Education

8.4.2 Sub-Objective 3.1 – Consultation, Information and Education

To consult with and educate the community to ensure people are well informed on Corporation's policies and plans; ensure that they have adequate input; and that the Corporation responds appropriately to their concerns.

Status

Hunter Water has achieved the required actions for Consultation, Information and Education. Further information is included in Appendix J.

Discussion

Hunter Water continues to actively consult with the community and provide support to community groups and schools including education, sponsorship and Streamwatch programs.

Hunter Water continues to meet on a quarterly basis with the Consultative Forum. The corporation will, in future, be submitting the annual revisions of the EMP to the Forum for review and comment prior to finalisation. The aim is to seek community input into the process of defining the actions in the EMP.

8.5 Objective 4.0 - Stormwater

8.5.1 Introduction

Overriding Objective

To co-operate with other organisations and the community to improve urban catchment management in Hunter Water Corporation's area of responsibility.

Sub-objective

One sub-objective has been identified to achieve this overriding objective:

4.1 Urban Catchment Management

8.5.2 Sub-Objective 4.1 - Urban Catchment Management

To play a supportive role in urban catchment management in the Corporation's area of operations.

Status

Hunter Water has achieved the required actions for Urban Catchment Management. Further information is included in Appendix J.

Discussion

Hunter Water continues to actively support local TCM committees and councils in stormwater management including the preparation of management plans and funding for education programs.

8.6 Objective 5.0 - Corporate Responsibilities

8.6.1 Introduction

Overriding Objective

To carry out all of Hunter Water's activities in a manner which has minimal environmental impact in accordance with the principles of ecologically sustainable development.

Sub-objectives

Five sub-objectives have been identified to achieve this overriding objective:

5.1 Environmental Due Diligence

5.2 Environmental Assessment and Review

5.3 Environmental Auditing

5.4 Performance Evaluation and Reporting

5.5 Annual Revision of Environmental Management Plan

8.6.2 Sub-Objective 5.1 – Environmental Due Diligence

To demonstrate environmental due diligence in all Hunter Water's activities.

Status

Hunter Water has achieved the required actions for Environmental Due Diligence. Further information is included in Appendix J.

Discussion

The Corporation continues to conduct training in environmental issues for staff, effectively manage land owned by the Corporation, review and update the EMS and develop energy management initiatives.

An audit of environmental training throughout HWC was carried out by the Compliance and Review Group (November 2000) to examine the types of training offered, contractual arrangements for training and the

relationship to the EMS. As a result, oil/chemical spills training is included in the training provided to field staff.

8.6.3 Sub-Objective 5.2 - Environmental Assessment and Review

To assess Hunter Water's impact on the environment and develop strategies to minimise our impact.

Status

Hunter Water has achieved the required actions for Environmental Assessment and Review. Further information is included in Appendix J.

Discussion

Hunter Water is actively assessing and reviewing the environmental impact of its activities. The Environmental Risk Assessment Review was updated in June 2001. Hunter Water reports on specific topics associated with areas of risk and those areas covered by the audit program. The use of the Green Slip system for consideration of environmental, economic and social aspects of construction or planned maintenance proposals was continued during the year.

8.6.4 Sub-Objective 5.3 - Environmental Auditing

To assess Hunter Water's environmental activities and determine their level of compliance with environmental legislation and corporate environmental objectives.

Status

Hunter Water has achieved the required actions for Environmental Auditing. Further information is included in Appendix J.

Discussion

Audits of Hunter Water's activities are undertaken in accordance with legislation and corporate environmental objectives. Environmental audits were undertaken generally in accordance with the audit schedule for 2000/2001. Hunter Water regularly audits the Regulatory Monitor Folders to ensure compliance with regulatory requirements.

8.6.5 Sub-Objective 5.4 - Performance Evaluation and Reporting

To monitor and report on the performance of the Environmental Management System (EMS).

Status

Hunter Water has achieved the required actions for Performance Evaluation and Reporting. Further information is included in Appendix J.

Discussion

Hunter Water has reviewed and reported on the Corporation's performance against the EMS. The Environmental Performance Indicators were reviewed and updated in the June 2001 revision of the EMS. The Annual Environmental Report included performance against key indicators.

Draft ESD indicators have been developed (June 2001) and are proposed for inclusion in the EMP.

The 1999/2000 Environmental Report was published in August 2000.

8.6.6 Sub-Objective 5.5 - Annual Revision of Environmental Management Plan

Ensure Environmental Management Plan activities are appropriate to drive environmental improvement.

Status

Hunter Water has achieved the required actions for the Annual Revision of the Environmental Management Plan. Further information is included in Appendix J.

Discussion

The EMP has been reviewed and updated by each manager responsible for components of the EMP. The final revision of the EMP was completed and presented to the Board in July 2001.

8.7 Factors Affecting Performance 2000/01

The high level of compliance with the EMP actions demonstrates Hunter Water's commitment to environmental performance. This commitment is evident throughout the organisation.

9 Customer Management

9.1 Overview

Customer management is not part of the Operating Licence. However, since Hunter Water's objectives include to be "commercially successful", customer satisfaction is an important aspect of the corporation's performance.

In 1995, Hunter Water introduced the Customer Charter which documented their commitment to customer service, distinct from a regulatory requirement. The Charter outlines minimum levels of service in terms of water service interruptions, low pressure, and sewer surcharges, and gives details of customer rebate schemes, which are discussed in Section 9.4. Hunter Water monitors its performance in meeting the Charter's standard and has paid over \$18 000 in rebates in the past year.

In 1998, Hunter Water introduced a Complaints Handling Policy. It is implemented through the Hunter Water Customer Services System (CSS), which is discussed in Section 9.5. The aim is to identify significant trends in order to develop actions to improve systems. Ongoing staff training has also been responsible for Hunter Water's improving capability to respond to customer complaints.

In order to assess customer satisfaction, Hunter Water carries out a customer perceptions survey and a telephone satisfaction survey (which is planned to start in late 2001). The surveys are planned to be conducted biennially in alternate years. Outcomes are used to deliver a set of key findings, aimed at the continual improvement of customer satisfaction. Data collected by these surveys, CSS and the database AOMS, is currently being assessed for future integration. Integration would provide a wider base for the development of strategic plans for future customer service performance.

As with technical operational areas, such as water supply and sewerage, administrative procedures can also be affected by factors outside Hunter Water's control. The CSS logged an increase in the number of complaints during the audit period than the previous year. This was most likely due to low pressure issues and sewer surcharges. Results of the 2001 Perceptions Survey, and later the Telephone Surveys will provide a more detailed understanding of factors affecting performance in customer service.

9.2 Requirements

Customer management is not a formal requirement under the Operating Licence. However, given the essential nature of the services provided by HWC and its position as a monopoly business, IPART believes that an assessment of performance in this area is appropriate.

In the terms of reference for this audit, IPART believes that, as a minimum, the auditor assesses and comments upon performance in the following areas:

- HWC's performance against its Customer Charter
- Customer complaints handling
- Outcomes of annual Customer Survey

This section of the reports provides an overview of the customer management issues in HWC. The following table lists the specific requirements of the Terms of Reference. The sections in the report where the issues are discussed have also been listed.

Audit Requirements	Comments
<p>HWC's progress in implementing audit recommendation 14 arising from the 1999/00 Operational Audit.</p> <p>This recommendation reads:</p> <p>Integration of the information gathered from the Assets Operations Maintenance System (AOMS) and Customer Care systems should be investigated to enhance analysis of complaints and provide strategic direction on customer service.</p>	<p>HWC has progressed by improving links between AOMS and CCS, and plans to provide further integration in the future.</p> <p>Further details are provided in Section 9.7.</p>
<p>HWC's Customer Complaints Handling Policy. What internal definitions or assumptions are used to clarify or provide interpretation to the policy?</p>	<p>The calls are divided into the following categories: general query, enquiry, (contact), complaint, service/emergency calls. The definitions are provided in the table in Section 9.3.</p>
<p>The auditor should report on the total number of complaints received in each category and over each complaint recording system (ie Customer Care system, Asset Operation and Maintenance System and Customer Charter System).</p>	<p>The total number of contacts and complaints in 2000/01 were 5,995 and 1,203 respectively.</p> <p>A breakdown is provided in Section 9.5.5.</p>

Audit Requirements	Comments
The extent to which HWC analyses complaint data to identify and address systemic problems. Are there systems or mechanisms in place to use complaint information in this fashion?	The auditors are satisfied that for each complaint category, HWC identified causes and trends and implemented actions to manage the complaint category.
The major findings of the most recent Customer Survey	The latest customer survey was done in June-July 2001. The results are still being compiled and analysed by HWC and their consultants, and no results have been available to the auditors. The results should be provided to IPART as soon as they are complete.

9.3 Customer Service

HWC operates a call centre and a control centre, based at the Hunter Street offices, and six Customer Service Centres at Newcastle, Boolaroo, Cessnock, Maitland, Salamander Bay and Raymond Terrace. A number of the Service Centres are co-located in council offices to enable more convenient access for the public and improved working conditions for staff.

The call centre and the control centre operate 24 hours a day, with additional functions after hours including despatching, emergency calls and monitoring of the operation system (SCADA).

Customers may also access information through the HWC web site that contains general information, as well as documents including the Customer Charter and Customer Complaints policy.

Payment of bills at Australia Post offices has been available for a few years. Recently, HWC has established an arrangement with Australia Post for 24-hour telephone and on line payment of bills, which many customers are accessing.

When a customer contacts HWC, the call is answered by an operator and responded to according to a set of procedures.

Details of customer inquiries are given in the table below.

Call Type	Definition	Recording System	Approx no of calls per annum	Comments
General query	A call from a customer that can be answered immediately	Meridian Max	105 000 service centre visits not recorded	All phone calls enter system.
Enquiry (contact)	A query that results from an approach by a customer (written or verbal), which can be satisfied by providing written or verbal information, advice, assistance, clarification, explanation or referral about a matter.	Customer Care System (CCS)	6 000	Excludes complaints and service fault calls.
Complaint	Is an expression of dissatisfaction about an action, a proposed action, or a failure to act by HWC, its employees or contractors. It can be written or verbal.	Customer Care System	1 200	Does not include enquiries or service fault calls.
Service/emergency calls	A call from a customer that requires action in the repair of infrastructure.	Asset Operations Management System (AOMS).	40 000	Call centre staff are able to view the progress of jobs through AOMS if a customer calls and requires a response. Priorities allocated to calls according to procedures.

Hunter Water Corporation has brochures available on Customer Service that it periodically sends to all customers with quarterly billing notices. Information is available on request through the call centre or at service centres.

HWC Customer Service staff take a proactive approach during times of major operational or climatic problems. Operations staff notify customer services when it appears there will be a major and lengthy shutdown

covering a large area. Staff then make a decision on actions to take which may include door knocking the affected area, providing water tanks and bottled water, ensuring critical customers are looked after and alerting the media. This operation occurred several times in the last 12 months during both the extreme hot weather and floods.

9.4 Customer charter

9.4.1 Origin and standards

The Customer Charter was introduced in July 1995 by HWC. The Charter is management's commitment to customer service, as distinct from a regulatory requirement.

Hunter Water Corporation's Customer Charter

- spells out the Corporation's objectives for responding to service interruptions which affect individual properties
- provides details of actions the Corporation will take where the Service Standards outlined in the Charter are not met over the course of the year.

In the Charter, HWC outlines its objectives for responding to service interruptions. This includes assessing urgency within 30 minutes of being contacted, reinstating services within 6 hours and cleaning up the area, and, if the services can't be reinstated within 6 hours, alternative arrangements will be made and two days notice given of planned interruptions.

The Charter states:

Water

HWC will rebate the Water Service Charge if, over the course of a year, as a result of a failure of Hunter Water's system:

- Total confirmed interruptions to the water service exceed 24 hours;
- Confirmed low water pressure events occur on more than 5 separate occasions.

Sewer

HWC will rebate the Sewer Service Charge if, over the course of a year, as a result of a failure of Hunter Water's system:

- More than 3 confirmed surcharge events (overflows) are experienced on an owner's property.

The rebates are calculated and paid automatically through the Asset Operations Management System. Reports are also extracted from this system at regular intervals to identify customers who have been affected by Charter events (ie discontinuities or low pressure events). A management team reviews these reports to establish any systemic problems that should be addressed, in order to avoid the customer's level of service reaching rebateable levels.

9.4.2 Rebates paid under the Customer Charter

Expenditure in each of the Charter categories for Water Discontinuity, Low Pressure and Sewer Surcharge for each year since inception is shown in the following table.

Incident Type	95/96	96/97	97/98	98/99	99/00	00/01	Total
Discontinuity	\$ 3,472	\$115,015 Note 1	\$29,892 Note 2	\$4,538	\$29,794 Note 3	\$2,692	\$185,407
Low Pressure	\$2,425	\$381	\$4,525 Note 2	\$123	\$7,765 Note 3	\$15,216 Note 4	\$30,437
Sewer	\$625	\$2,210	\$6,335	\$1,629	\$1,719	\$202	\$12,722
Total	\$6,523	\$117,607	\$40,753	\$6,291	\$39,279	\$18,111	\$228,566

Source: Hunter Water Corporation

Notes:

1. Water Discontinuity rebate increased in 1996/97 due to four major trunk main breaks.
2. Discontinuity and low pressure rebates in 1997/98 were due to 2 major events.
3. Water Discontinuity and Low Pressure rebate increased in 1999/00 due to water supply operational problems.
4. Low Pressure rebates increased in 2000/01 due to low pressure events in localised pockets including Edgeworth, Medowie, Balcolyn, Warners Bay and Wallalong. The low pressure was attributable to peak high demand in the particularly hot summer months.

Over a six year period, an average amount of \$38, 094 has been paid per annum. As indicated in the notes, extreme weather events and system failures accounted for a significant number of rebates.

The data in the previous table refers to the amounts rebated, rather than the number of properties affected. There has been a rebate amount of \$25 (Water and Sewer Service Charge) until 1 January 2001, when this was raised to \$50 for low pressure only. There are three different types of incident-based rebate, ranging from \$25 to \$202. This amount applies to residential and business properties alike and is only paid once in any financial year period. During the audit period, 4,000 properties received an incident-based rebate.

9.4.3 Analysis

The origin of the standards and objectives for responding to service interruptions is unclear. HWC staff were unable to clarify whether the standards had been adopted based on customer expectations or operational requirements or a combination of the two. There has been an informal review of the standards and objectives, but no formal review to take into account any operational improvements or changing customer expectations. It is recommended that these standards be reviewed as part of the Licence Review.

It should also be noted that the Charter standards are different from the requirement of the Operating Licence. For example:

- ❑ Water pressure - the licence target (for 95% of properties) is 20m head, whereas the Charter defines low water pressure as less than 12m head.
- ❑ Discontinuity times – the standard in the Licence is 5 hours whereas Charter rebates apply to interruptions of more than 24 hours in a financial year.
- ❑ Sewer surcharges – Charter rebates apply to customers who have experienced 4 or more surcharges in a financial year, whereas the Licence makes no reference to this frequency.

The review of the Charter standards for the Licence should include:

- ❑ customer views on the value of automatic customer rebates;
- ❑ the standards adopted for calculating rebates (including the difference between residential and commercial customers) ;
- ❑ the methods for calculating rebates ie from system shutoff times, without taking into account the time the complaint (if any) was made; and
- ❑ the roles of the Charter rebates. Is the purpose:
 - ❑ a form of compensation to customers; or
 - ❑ a gesture of goodwill for inconvenience caused; or
 - ❑ an incentive for Hunter Water to improve performance.

Recommendation 19:

The Customer Charter should be reviewed with specific focus on:

- (1) the consistency between measures used in the licence and the Customer Charter;
- (2) clarifying the purpose of the rebate, compensation, goodwill or motivation for improvement; and
- (3) methods for measuring discontinuities and low pressure flows (from time of report or time valve shut down).

9.5 Customer Complaint Handling

9.5.1 Policy description

In March 1998, a Complaints Handling Policy was introduced based on the Australian Standard AS4269-1995 for Complaint Handling. Hunter Water's Customer Care system (which is a module of the Customer Services System {CSS}) is used to register *contacts* with customers, that is, it recorded interactions. Hunter Water's policy provides definitions for both "complaints" and "enquiries", as outlined in Section 9.3.

The Australian Standard outlines the need for an appropriate system to record complaints and their outcomes. The Customer Care system was designed to meet this purpose and the data is classified into specific categories in order for analysis of trends, and to enable rectification of systemic or recurring problems.

In 2000/01, there were 1,203 complaints logged, an 11% increase from 1999/00 with 1,083 complaints. HWC provided a number of explanations for the increases including a long hot summer with increased consumption, flooding and a refining of complaint categorisation. The number of contacts decreased by 17% from 7,257 in 1999/00 to 5,995 in 2000/01.

9.5.2 Complaint Management Systems

HWC have outlined the processes in place to review complaints data, identify significant trends and develop actions to improve systems, etc. These include:

- Each month the top 10 complaints registered in the system are extracted. On average these represent around 90% of recorded complaints. Each of the complaints in each of the top 10 categories is analysed to determine if there are any apparent trends or correlations and the information is provided to the Executive.
- There is cross-divisional reporting of complaints and discussion on customer related issues.
- The Manager Customer Services and Manager Call Centre meet weekly with a representative from Planning & Development to discuss issues related to service delivery/operational problems, with the objective of determining an appropriate course of action.
- A report on Contractor Complaints is forwarded to Planning and Development each month to ensure that there are no systemic issues to be addressed in terms of the in-house or ex-house contracts. (Note this is over and above each of the complaints being individually addressed with the customer by the Customer Services Group).
- An executive operational committee (comprising the Managing Director, Managers Planning and Development, Community Relations and Operations) meets quarterly to discuss interactions between the 3 groups. High level customer issues (eg policy and

complaint trends) are discussed at these meetings. In addition, a "next level down" operational committee has recently been formed to discuss and resolve systemic issues relating to service delivery.

- Customer Service Staff also receive the top 10 complaints and accompanying commentary with their staff newsletter "Frontline".

9.5.3 Service Calls

Service difficulties are logged through AOMS, a business data base system which captures the following information:

- Service difficulties;
- Planned maintenance work;
- Dispatching of jobs to Civil Contractor or other contractors;
- Details of work undertaken on completion of jobs (customer feedback);
- Asset condition data entry (water and sewer reports);
- Civil Contract payment;
- Civil Contract compliance;
- HWC Licence performance monitoring;
- HWC Customer Charter performance reporting;
- Asset maintenance management – sewer;
- Asset maintenance management – water;
- Exception reporting; and
- Early warning "dashboard".

The auditor was able to view the AOMS Procedures Manual that contains definitions of service fault types, procedures to be followed for prioritisation and response times and interactions with operations staff. The auditor was satisfied that staff had received training and that there were improvements in systems to extract and manage information from AOMS.

9.5.4 Customer Service Staff Training – 2000/01

In addition to the ongoing training of employees in areas related to customer management, a purpose designed course was developed in the last year and run by the Customer Services Group to train Operations employees in customer relations. As well, customer relations training was provided to newly appointed Control Centre Operators and Customer Services recruits.

9.5.5 Customer Care Contacts and Complaints

A complete list of customer contact statistics is provided in the following table. Appendix D contains detailed descriptions of each of the following categories.

Description	2000-2001		1999-2000	
	Contacts	Complaints	Contacts	Complaints
Account Enquiry	1111	161	935	202
Advertising	1		1	3
Asset Enquiry	279	156	361	200
Backventing	3	14		
Build Over Sewer	1096	3	1441	
Capital Works Complaint		3	1	6
Charter Low Pressure	56	39	523	17
Charter Sewer Surcharge	174	26	150	27
Charter Water Discontinuity	895	3	1181	7
Compensation	35	65	57	36
Contractor Complaint	17	202	16	215
Customer Service Compliment/Complaint	30	56	24	52
Development	8		2	2
Discharge/Sewer Use	27	14	31	8
Exemption	2		3	
Extension Sewer	5		31	1
Extension Water	3		8	1
Fencing Claims	29	1	41	1
General	339	12	40	19
High Consumption	43	45	63	25
Hydraulic Plans/Backflow Prevention	226	1	287	
IVR Credit Card Payments	1	6	N/A	N/A
Irregular Service	33	6	7	4
Leak Concealed from view	174	5	171	8
Metering	365	135	303	94
Ministerial	1		1	1
Non Standard Service	82	1	173	3
Notification of Shutdown	6	78	2	2
Odour	3	31	2	40

Description	2000-2001		1999-2000	
	Contacts	Complaints	Contacts	Complaints
Peg sewer	156		201	
Pump Effluent & CEP	7			
Recovery Management	470	6	722	7
Reflux Valve	2	3		
SSAC/HSP	7	3	8	4
Sewer Junction	31		85	1
Statement of Available Pressure	156	1	227	
Stormwater	8	15	15	16
Tee & Valve	68		61	
Tree Roots	17	3		
Water Leak	9	12	46	18
Water Quality	20	97	30	63
Year 2000 (Y2K) inquiries.	N/A	N/A	7	
OVERALL TOTALS	5995	1203	7257	1083

There was an increase in the number of complaints recorded in the past year. This was identified as being due to a number of reasons including a more proactive approach by customer service staff, the unseasonal weather conditions and wider publicity of the customer service line.

9.5.6 Customer Care Top 10 complaints

The top 10 complaints for the 2000/01 year are summarised in the following table, together with a comparison against 1999/00. Definitions and commentary follow.

Description	2000/01	1999/00
Contractor Complaint	202	215
Account Enquiry	161	202
Asset Enquiry	156	200
Metering	135	94
Water Quality	97	63
Notification of Shutdown	78	2
Compensation	65	36
Customer Service Complaint	56	52
High Consumption	45	25
Charter Low Pressure	39	17

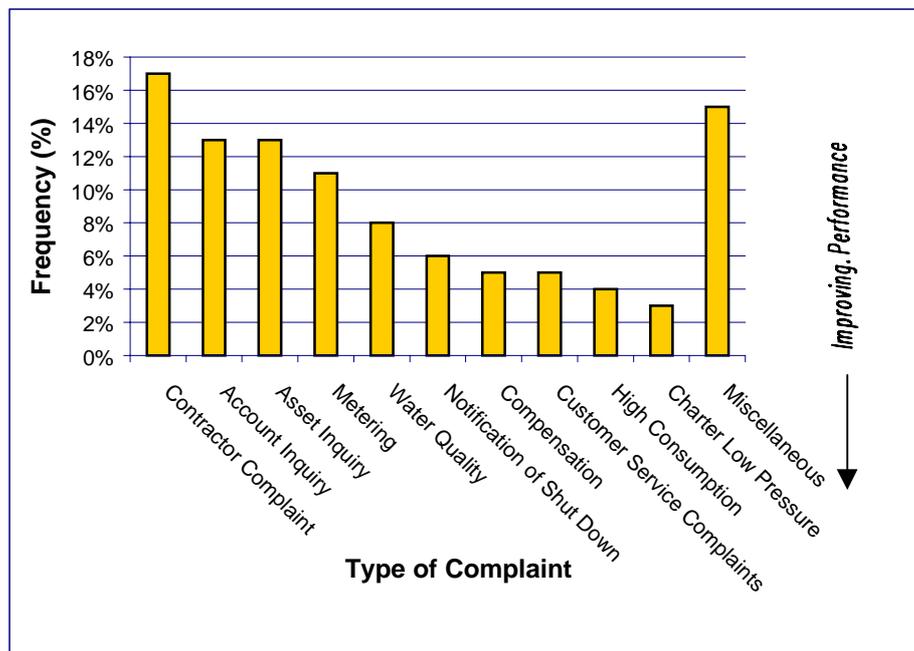
The top ten complaints make up 85% of the total number of complaints. The percentage of each complaint in relation to the total is shown in each category.

- **Contractor Complaint:** This category covers complaints for any contractor working on behalf of Hunter Water. Complaints generally concern restoration, timeliness or quality of workmanship.

A module on the AOMS system was developed during 2000/01 to capture these complaints and also to ensure that restorations are carried out more efficiently.

- **Account Enquiry:** encompasses a range of accounting issues such as service and usage charges, delays in the processing of information, problems with account or property information and other customer account issues.
- **Asset Enquiry:** are complaints made regarding any HWC asset and include sewer, water and property assets. In the latter part of 2000/01 there has been a particular focus on improving the logging of complaints against the relevant category.
- **Metering:** complaints are specific to metering issues such as disputed averages/usage, over-reads and meters not read.
- **Water Quality:** covers taste, dirty water and other aesthetic quality issues. Complaints rose in 2000/01.
- **Notification of Shutdown:** relate specifically to problems with the notification of shutdown and can be about either emergency or planned shutdowns. These complaints arose in 2000/01. One of the reasons for this increase is considered to be better categorisation.
- **Compensation:** complaints relate to minor property damage.
- **Customer Service Complaints:** This category tracks complaints related to specific customer service issues – such as policy or procedural issues with regard to debt recovery, payment options, meter management or with delays in service or enquiry response.
- **High Consumption:** complaints relate to high usage on a customer's account.
- **Charter Low Pressure:** All charter pressure incidents receive a count via the Customer Charter and are automatically logged to Customer Care as contacts.

Figure 9.1: Frequency of Customer Complaints



HWC were able to demonstrate that for each major category, they had identified causes and trends and implemented actions to manage the complaint category.

9.5.7 Feedback from customers

In the absence of formal surveying in this audit period, a small random sample of customers who complained or recorded service faults were contacted and asked about their experience in dealing with HWC.

Customers in various complaint categories from the CSS system were interviewed based on the following sample.

Complaint category	Customers selected
Contractor complaints	3
Account enquiry	4
Asset enquiry	4
Metering	1
Water quality	1
Notification of shutdown	2
Compensation	1
Customer service	0
High consumption	1
Charter low pressure	1
Service calls	5
Total	23

The sample was selected from those in contact in the last three to six months for the benefits of recall. The sample was randomised across geographic areas and care taken to obtain a mix of customer types. However, this survey may not be an accurate representative of actual customer perceptions. Hunter Water is conducting a Customer Perceptions Survey, which was not available at the time of the audit.

Respondents were asked to rate the following statements by level of agreement, ranging from strongly agree to strongly disagree (within a framework of 5 categories). There was also an option of a no response answered:

- 1 The manner in which I was dealt with gave me the impression that HWC staff were committed to resolving my complaint/service call;
- 2 I was able to lodge my complaint/service call easily;
- 3 I was informed of how long it would take to resolve my complaint/service call;
- 4 My complaint was resolved in the timeframe outlined;
- 5 The staff heard and understood my complaint, and treated me courteously; and
- 6 The complaint/service was resolved to my level of satisfaction.

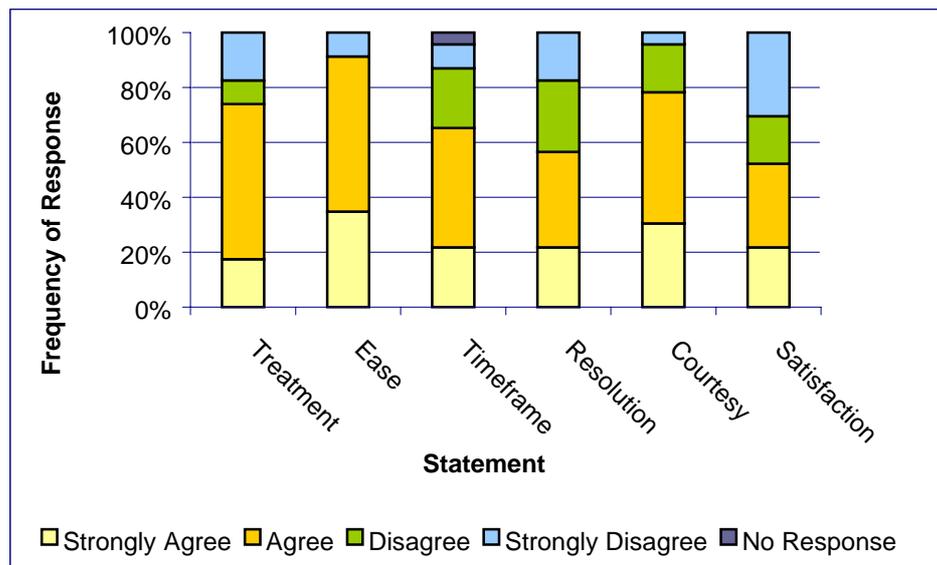
An additional question that requested the respondent's own comments on HWC customer service concluded the survey;

- 7 Do you have any suggestions on how your complaint/service call could have been dealt with better?

Results

The overall outcome of the survey was positive. For all statements, more than 50 percent of respondents provided a positive response, with particularly high satisfaction with the ease of lodging complaints and staff courtesy. Figure 9.2 illustrates the frequency of positive responses.

Figure 9.2: Positive Survey Responses



The additional question that concluded the survey produced a number of varying responses. A few people stated that they 'could not have been dealt with any better' and that the 'staff were very courteous and understood the complaint'. Alternatively, a number of people located on farms stated that the customer service people seemed 'unfamiliar with rural water problems' and that 'HWC should listen to the NRMA's relationships with their clients and take note'.

Client relations were deemed to be very important to respondents in this survey. Respondents complained of HWC not returning phone calls when they promised to do so and, in one case, a respondent recalled a rude response.

Generally, the view was that clients found HWC Customer Service to be acceptable with a few notable exceptions. However, it should be noted that the sample size was limited and therefore only provides a partial measure of performance standard.

9.6 Outcomes of Consumer Liaison

9.6.1 Change to survey approach

The Corporation has undertaken a customer perception survey annually since 1987. In December 1998 the Corporation's Board endorsed a change to the Corporation's customer research, as follows:

- The perception survey should be conducted biennially rather than annually; and
- To supplement the perception survey findings, the Corporation should develop a program to survey satisfaction levels of customers who had had an actual service experience with Hunter Water (either in the field, or over the phone).

This proposal was accepted by the Licence Regulator on the basis that it would become part of the conditions of the Corporation's next Licence period. This will commence on 1 July 2002.

9.6.2 2001 Perceptions survey

The 2000/01 Perception Survey is currently under way. Respondents were drawn from the Corporation's database. Five hundred (500) face to face interviews are being conducted, together with 500 telephone interviews to ensure some comparability with previous surveys. Three hundred and fifty (350) respondents from each group are drawn from the residential customer base, and 150 from the industrial/commercial sector.

HWC has carried out face to face interviews in previous years, and it intends to conduct future surveys through telephone interviews. The July 2001 survey is carried out as both face to face and telephone interview to enable comparison of the response received by the two methods, so that time series comparison can be validated.

The Survey company is required to deliver a set of key findings that will be actionable and can be used to improve either customer perceptions of HWC, or actual service. Interviewing will be complete by 11 July 2001, and results are expected to be available later in the year.

Recommendation 20:

Hunter Water should provide IPART with the results of the 2001 Customer Perceptions Survey no later than 31 December 2001.

The second project focuses on Telephone Satisfaction Surveying. Customers who have had a recent contact with Hunter Water's Call Centre or Emergency Control Centre will be randomly selected to participate in a survey. The survey will determine their level of satisfaction from answering the call, through all facets of the service encounter including responsiveness, timeliness, completion, quality of work etc. Development of the questionnaire is to occur in August 2001.

Surveying is likely to commence towards the end of 2001. Eight hundred (800) interviews will be conducted annually.

Recommendation 21:

Results of the Customer Telephone Satisfaction Survey should provide a methodology for follow up procedures for customers with complaints. This may include measures for complaint resolution.

9.7 Data Collection

9.7.1 Integration of AOMS

Requirement and Compliance

Recommendation 14 of the 1999/00 operational audit requires	Compliance
Integration of the information gathered from the Assets Operations Maintenance System (AOMS) and Customer Care systems should be investigated to enhance analysis of complaints and provide strategic information on customer service.	In progress

Discussion

The AOMS and CSS systems are used for different purposes and are not directly linked. During the past year, HWC has introduced a number of management systems with a view to combining and analysing data to improve performance and customer service as outlined in Section 8.3.2.

It is understood that the Corporation has plans to review the customer service system in this financial year. This should be done as a matter of priority.

Recommendation 22:

Suggest that an investigation and subsequent report be made concerning the integration of the AOMS and Customer Care Systems. The report should be completed by June 30 2002, and assist in streamlining responses to customers.

9.7.2 Data collection systems

As part of the review of the Customer Care and Asset Maintenance systems, the following issues should be addressed:

- A review of standards and service objectives in the Customer Charter. Consideration should be given to the comparability of standards in the Licence and the Charter;
- Integration of the process for handling all customer enquiries including: calls, contacts, complaints and service calls (as currently defined);
- Regular contact with a sample of customers who have made services calls and complaints to review their level of customer satisfaction; and
- Further improvements of the management system information to address issues of customers with repeat problems or long term issues of service standards.

9.8 Factors Affecting Performance 2000/01

The performance in 2000/2001 has been similar to that in the previous year. Whilst there has been a reduction in the number of contacts, there has been an increase in the number of complaints.

Customer management initiatives taken by the HWC during the year (refer Section 9), have improved the service to customers. The results of the customer survey, due later in 2001, will provide more understanding as to the factors affecting performance.

9.9 Conclusion

Hunter Water Corporation has instituted practices in recent times to address the Customer Management issues raised in previous audits. Management system reports have been developed in order to analyse systemic or recurrent problems in service delivery and there are regular meetings of management at a strategic and operational level to address these concerns.

The transition to a new customer service survey program is important in order to collect data on customer satisfaction. The small survey undertaken as part of this audit revealed that there may be areas of improvement needed in following up customer complaints and service calls. The Corporation should feed this data into the existing interdepartmental committees for analysis and action.

Hunter Water has also identified that major changes are needed to the customer databases. The AOMS system appears to be working well with wide functionality, however the customer care database is limited. It is understood that work is being undertaken on an integrated customer system.

The past year has been marked by several significant climatic events, including hot weather and floods. Hunter Water took a proactive approach to servicing customers during these events as part of a longer term customer management approach. These extra measures exceed licence requirements, and demonstrate an extra commitment to customers.

10 Factors Likely to Affect Future Performance

10.1 General

10.1.1 Operating Licences

Hunter Water is driven by the various regulatory frameworks which control its operations. It appears to the auditors that a focus on Operating Licence compliance is the main driver for HWC operations. Other drivers, such as business objectives, long term planning and objectives, and continuous improvement principles, are secondary in consideration.

Further, the auditors feel that Hunter Water management is sometimes reluctant to adopt targets and plans voluntarily, as these are likely to be included in the regulatory regime and become the subject of audits. This expectation is based on experience, when voluntary targets, such as the Customer Charter, are subjected to auditing as part of the Licence compliance audits. For this reason, where additional targets have been considered by Hunter Water, they are predominantly informal.

An example of this is the standard of security of supply against drought. As discussed in Section 6 (page 16), the current licence standard is impractical, because HWC will comply with the standard if it imposed a 9 year restriction in a 10 year period, while allowing the storage to deteriorate to 10%. This extreme situation is obviously not acceptable, and HWC planning standards for the security of supply are higher. These higher standards are not documented or discussed formally.

The above notwithstanding, the auditors recognise that with respect to customer service, HWC has voluntarily adopted targets, as well as a rebate scheme, through the Customer Charter.

The auditors suggest that Hunter Water adopt management strategies, targets and long term plans outside the regulatory regime to support the performance, business objectives and licence requirements.

10.1.2 Changes in Operating Environment

As discussed in Section 6, changes in the operating environment in 2000/01 have had some effect on compliance. Whilst no major changes are expected in 2001/02, it is envisaged that a new Operating Licence will be adopted on 1 July 2002.

It is possible that the adoption of this new licence will have an impact on operations. In accordance with Recommendation 9, the auditors suggest that HWC prepare a transition plan to ensure full compliance with licence requirements, real and administrative, during the impending licence transition.

10.2 Water Supply

10.2.1 Water Quality

The water quality supplied by HWC has historically been better than the standards. However, the main issues for water quality are the identification and reduction of risks.

Hunter Water is continuously working on reducing these risks, through capital works, management procedures and contingency plans.

It is expected that past and future initiatives will enable Hunter Water to continue to supply high quality water to its customers.

10.2.2 Service Interruptions and Water Pressure

No major factors have been identified as affecting future performance. Following the recommendations of this audit with respect to low pressure properties would assist HWC to improve its performance on this parameter.

10.2.3 Security of Supply against drought

As discussed in Section 6.7.2, the security of supply against drought will significantly improve with the implementation of the works that will increase the capacity of Grahamstown Dam.

10.3 Sewerage

10.3.1 Wastewater Treatment Plants

No major factors have been identified that will affect the performance of this standard (although none have been set by the EPA at this stage).

10.3.2 Sewer overflows

Sewer overflows are likely to be included in the system licence from the EPA. The EPA may have different requirements and standards.

10.4 Environmental Management Plan

No major factors have been identified that will affect the performance of this standard. As discussed in Section 8, the performance of HWC on this item has been good.

10.5 Customer Service

The ongoing initiatives taken by Hunter Water in 2000/2001 are expected to have a long term positive impact on customer service.

In addition, the results of the customer survey undoubtedly will result in additional steps and procedures to improve this aspect of the operation.

Appendix A Audit Plan

**Independent Pricing and Regulatory
Tribunal**

**2000/2001 Operational
Audit of Hunter Water
Corporation**

Audit Plan



Independent Pricing and Regulatory Tribunal

2000/2001 Operational Audit of Hunter Water Corporation

Audit Plan

Author: Robyn Campbell

Date: 10 July 2001

Checker: Gidi Azar

Report no: NS00947/NT0130AA

Approver: Gidi Azar

Disclaimer

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1 Audit Objectives and Scope

The objective of the audit is to advise and report to the Independent Pricing and Regulatory Tribunal (IPART) on the performance of Hunter Water Corporation (HWC) against its Operating Licence for the period 1 July 2000 to 30 June 2001.

Section 12 of the *Hunter Water Board (Corporatisation) Act 1991* provides the requirement for a licence for the operations of HWC. The scope of the Operational Audit is defined in clause 8 and Schedule Five of the Operating Licence.

Clause 8 of the Operational Licence requires that:

8.1 "The Minister may (annually or at other times), cause an operational audit to be performed of the Licensee's performance of its obligations under clauses 4.1 and 5.3 (a) of this Licence by an independent expert nominated by the Regulator....., and

8.5 The operational audit will extend to the assessment of and reporting on the performance and progress of the Licensee in relation to the Environmental Plan."

In undertaking the audit the auditor must:

1. review and assess the level of compliance (or progress) achieved by Hunter Water against the Operating Licence criteria,
2. assess and report on progress by the Corporation in implementing the Ministerial Requirements and Audit Recommendations arising from the 1999/2000 Operational Audit of Hunter Water,
3. identify any factors that have affected the performance for the financial year ending 30 June 2001,
4. identify any factors that could impact on Hunter Water achieving its Operating Licence performance requirements in the future, and
5. based upon the audit assessment, make recommendations on how Hunter Water can improve its performance in the future.

The Minister for Energy has requested that the Tribunal conduct a full review of HWC's Operating Licence with a view to new arrangements being in place by 1 July 2002. Information gathered through the course of the Audit will be utilised as part of the process.

Audit findings which are considered to be outside the scope of the operational licence will be reported in a separate document.

The auditor is required to report on the extent of substantive compliance with the Operating Licence requirements.

The audit tasks are to be addressed, where appropriate, with reference to the provisions of the Corporations's Memorandum of Understanding with the EPA, the NSW Department of Health and its Water Management Licence with DLWC.

2 Audit Criteria

Licence Clause	Summary of Requirement
Cl. 4.1(a), Schedule 3	Water quality performance and standards, to be audited against the revised 1996 drinking water guidelines.
Cl. 4.1(b), Schedule 4, Part 1	Wastewater treatment works discharges shall meet the requirements of EPA licences
Cl. 4.1(b), Schedule 4, Part 2	Sewer surcharges shall occur at no more than 1.4 incidents per kilometre of main per annum; and 96% of customers per annum will not experience a sewage overflow on their property from the Corporation's sewer.
Cl. 4.1(b), Schedule 4, Part 3	92% of properties served will not incur discontinuity of water services for more than 5 hours duration annually.
Cl. 5.3(a)	HWC is required to maintain and provide works sufficient to meet a probable occurrence of drought (requiring the imposition of water restrictions) at no less than 10 yearly intervals. The security of water supply has been interpreted in a wider context as being the security of water supply to the customer, not just under drought conditions.
Cl. 8.5	The operational audit will extend to the assessment of and reporting on the performance and progress of HWC in relation to its Environmental Plan.

Section 13(2) of the Act states that “The operating licence must also include terms or conditions that require the Corporation to maintain procedures under which the Corporation is to consult with its customers at regular intervals...” in relation to the provision of water, sewerage, drainage and wastewater services.

The Audit Brief requires an assessment of:

- Hunter Water's performance against its Customer Charter;
- Effectiveness of its complaint handling procedures; and
- Outcomes of the Annual Customer Survey.

3 Organisational and Functional Units of HWC to be Audited and Key Personnel

PLANNING AND DEVELOPMENT	
- Assets	Russell Pascoe (Manager Planning and Development)
- Planning	Simon Zander (Relieving Manager Strategic Operations)
CORPORATE PLANNING AND REGULATION	
Environmental Policy	Kevin Young (Manager Corporate Planning and Government Regulation)
Compliance and Review	Bruce Petersen (Manager Environmental Policy) Kristy Nunan (Manager Compliance and Review)
OPERATIONS	
Maintenance	Alan Thornton
Wastewater Treatment	
COMMUNITY RELATIONS	
Customer Services	Helen Vorlicek (Manager Community Relations)
Call Centres	Belinda Jones (Manager Customer Services)
HUNTER WATER AUSTRALIA (HWA)	
HWA Laboratories	Andrea Swan (Laboratory Manager)
Operations	Darren Bailey (Manager Operations, HWA)

4 Procedures for Audit

The general approach to the audit will be based on Australian / New Zealand Standard AS/NZS ISO 14011:1996, Guidelines for environmental auditing - Audit Procedures - Auditing of environmental management systems.

The audit methodology will follow a four tier approach as described in the chart and as detailed below.

4.1 Tier 1 – Define Compliance Requirements

These will be extracted from:

- Hunter Water Operating Licence;
- MoUs, other licences, and other legal and statutory requirements;
- Ministerial requirements; and

- Other requirements specified in the brief.

4.2 Tier 2 – Collecting Data

The sources of data will be:

- Hunter Water Corporation, through interviews, reviewing documents and procedures,
- Key stakeholders, such as EPA and NSW Health,
- Last year’s audit, with particular attention to the recommendations, and
- Hyder’s observations, which will include critical review of the information provided by Hunter Water, site inspections and data from other sources (if relevant).

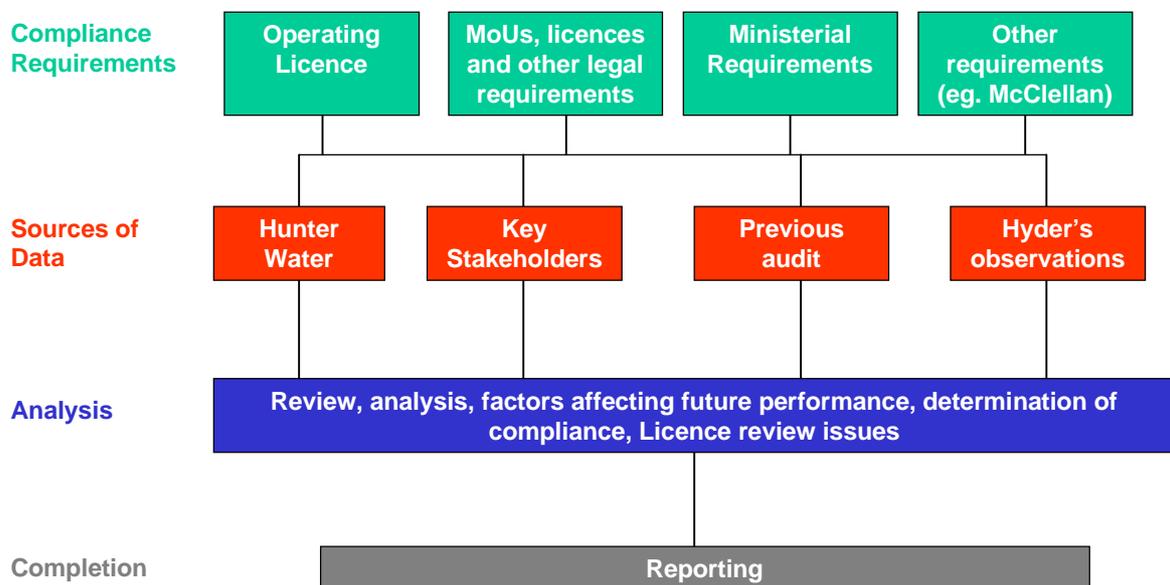
4.3 Tier 3 – Analysis

This tier includes analysis of the audit evidence to determine compliance, as well as identifying the factors affecting the current and future performance. Issues affecting the licence review will also be identified.

4.4 Tier 4 – Completion

This will cover the documentation of the findings in a clear report, and a Closing Meeting, as per AS 14011.

The audit will proceed in parallel by the four audit teams, each following the four-tier approach.



5 Reference Documents

Invitation to Tender, 2000/01 Operational Audit of Hunter Water Corporation, IPART, 2 May 2001.
Hyder Proposal for the Operational Audit of Hunter Water Corporation (NT01219A), 21 May 2001.
HWC Operating Licence, 1995
<i>Hunter Water Board (Corporatisation) Act 1991</i>
Hunter Water Corporation Operational Audit 1999/00, Trevor Brown and Associates, 27 October 1999.
Data supplied by HWC during the audit.

6 Audit Program and Location

The audit will be conducted according to the attached program.

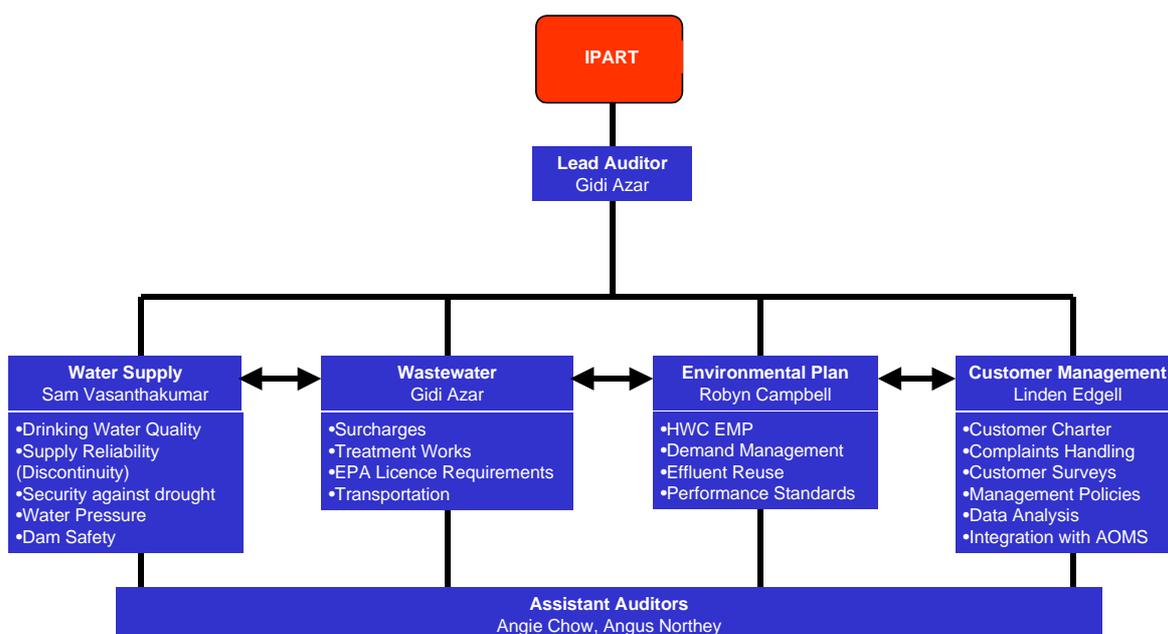
Interviews and meetings will be held in HWC offices in Newcastle and at HWC's other facilities.

Review and analysis of data will be undertaken at Hyder's offices in St Leonards.

Meetings with IPART will be held in IPART offices in Sydney.

Refer attached program.

7 Audit Team Members



8 Schedule of Meetings

The initial meeting with HWC will be held on 12 and 13 July 2001. Interviews and meetings will be held as follows:

Proposed Meeting Schedule 12-13 July 2001

Day	Time		Hyder Team Members			
			Gidi Azar	Sam Vasanthakumar	Robyn Campbell	Linden Edgell
Thursday 12 July 2001	am	10-11	Opening meeting (See below for Attendees)			
		11-12				
	pm	12-1	Lunch			
		1-2	Kevin Young/ Kristy Nunan		Helen Vorlicek/Belinda Jones	
		2-3		Simon Zander		
		3-4	Russell Pascoe, Simon Zander		Bruce Peterson	Helen Vorlicek/ Belinda Jones
		4-5				
			5-5.30	Bruce Peterson		

Friday 13 July 2001	am	9-10	Team meeting			
		10-11	Simon Zander	Review Records / TBA	Review Records / TBA	Review Records / TBA
		11-12	Simon Zander			
	pm	12-1				
		1-2	Visit 1: Grahamstown WTP with Darren Bailey		Andrea Swan – visit laboratory	Belinda Jones – visit Maitland Customer Centre
		2-3	Visit 2: Grahamstown Dam with Simon Zander			
		3-4.30	Visit 3: Raymond Terrace WWTW with David Bartley			
		4.30	Travel to Sydney			

Attendees of Opening Meeting:

Hyder team members:	IPART representatives:	Hunter Water Representatives:
Gidi Azar	Felicity Hall	Managing Director, David Evans
Robyn Campbell	Liz Livingstone	Manager Corporate Planning & Government Regulation, Kevin Young
Sam Vasanthakumar		Acting Manager Compliance & Review, Kristy Nunan
Linden Edgell		Manager Planning & Development, Russell Pascoe
		Relieving Manager Strategic Operations, Simon Zander
		Manager Community Relations, Helen Vorlicek
		Manager Environmental Policy Unit, Bruce Peterson
		Manager Customer Services, Belinda Jones

9 Confidentiality Requirements

Hyder is bound by a confidentiality agreement for this contract.

10 Report Content and Format

The audit report will be prepared generally in the same style as the previous Audit Reports. This will include graphs and tables providing data and historical information relating to compliance to enhance the readability of the report.

The report will be structured along the following lines:

- Executive Summary
- Introduction
- Methodology
- Assessment of Compliance
- Environment Plan
- Customer Management
- Water Supply
- Wastewater
- Factors affecting performance 2000/2001
- Factors affecting future performance
- Response to issues raised in the 1999/2000 audit

Appendices will include schedules of meetings and relevant data.

Audit findings which are considered to be outside the scope of the operational licence will be reported in a separate document, in a short letter format.

11 Document Retention Requirements

To be discussed at the initial meeting.

Appendix B

Letter to Stakeholders

17 July 2001

«Title» «FirstName» «LastName»

«JobTitle»

«Company»

«Address1»

«City» «State» «PostalCode»

Your Ref:

Our Ref: NS00947/NT0136FA

Dear «Title» «LastName»,

Operation Audit of Hunter Water Corporation

Hyder is conducting the annual audit of Hunter Water Corporation for the Independent Pricing and Regulatory Tribunal. The purpose of the audit is to assess the performance of Hunter Water Corporation against its Operating Licence and other requirements. The assessment will include a review of:

- Water quality performance and standards;
- Key operational standards for wastewater treatment works, service interruptions, surcharges and water pressure;
- Security of water supply to customers;
- Performance and progress of Hunter Water in relation to its Environmental Plan; and
- Customer service systems and standards.

If you wish to make any comments with regard to Hunter Water's performance and compliance to its Operating Licence, please contact the undersigned by 31 July 2001.

Yours sincerely

Gidi Azar

Lead Auditor

Distribution List

Title	FirstName	LastName	JobTitle	Company
Dr	Craig	Doulton	Director of Public Health Unit	Department of Health
Mr	Graham	Clarke	Acting Regional Manager	Environment Protection Authority
Ms	Cathy	Cole	Regional Director	Department of Land and Water Conservation
Clr	Alan	Davis MBE		Lake Macquarie City Council
Clr	Brian	Watson-Will		Port Stephens Council
Clr	Hans	Tol		Newcastle City Council
Clr	Jeffrey	Maybury		Cessnock City Council
Clr	Arch	Humphrey		Maitland City Council
Mr	Norm	Himsley		Dam Safety Committee

Appendix C

Water Quality Report

From HWC Web Page

WATER PERFORMANCE REPORT - JUNE 2001

This report marks the end of the licence year and as such, all year to date results actually represent the performance for the year with regard to the Corporation's Licence.

SUMMARY:

The Operating Licence sets standards of service requirements for -

- a Water Quality - Microbiological
- Chemical/Physical
- b Discontinuity (supply interruptions)
- c Low pressure

Data is collected and reported for the current month, year to date in the current licence period and for the performance over the last twelve months. Note that for water quality, compliance must be achieved separately for each of the Corporations geographical areas (Central, Southern and Northern Regions) as well as the Corporation as a whole. The body of the report details Corporate results while the regional results are attached in appendices "A" and "B".

For the month of June, overall Corporation licence performance was:

- a Water Quality
 - Microbiological - Samples Passed - Total Coliforms 99.1%
(Lic. target 95%)
 - Faecal Coliforms 99.1%
(Lic. target 98%)
 - Chemical - Samples Passing 99.1%

It should be noted that the Licence requires compliance on an annual basis and thus for compliance purposes the rolling twelve months result is a better indicator of Licence compliance than monthly figures. The rolling twelve month results are:

- Microbiological - Samples Passed - Total Coliforms 98.6%
(Lic. target 95%)
- Faecal Coliforms 99.7%
(Lic. target 98%)
- Chemical - Samples Passing 99.5%

- b Discontinuity - For June 0.12% (1.49% annualised) of properties had an interruption greater than 5 hours during the month. This brings the year to date result to 3.77% (Licence target less than 8%).

- c Low Pressure - 99.2% of customers did not experience verified low pressure (Lic. target 95%). The year to date results is estimated at 97.5%.

GENERAL:

The Corporation's Operating Licence sets water operational requirements for low pressure, discontinuity, microbiological water quality and chemical/physical water quality.

a Water Quality

The key issue for our customers is the quality of water delivered to their property. Hunter Water undertakes '**system performance monitoring**' to ensure that the National Drinking Water guideline standards are being met. This monitoring is undertaken at the property boundary and the results are used for assessing compliance with the guidelines.

In addition to monitoring for compliance purposes Hunter water, as recommended by the Drinking Water guidelines, also undertakes '**operational monitoring**'. This includes monitoring at treatment facilities and also within the distribution system at reservoirs that are classified as '*under grade*' or '*low turnover*'. The monitoring is used for process optimisation at treatment facilities. Within the distribution system the storages, which normally do not supply water into the system, are monitored to ensure water quality in them remains acceptable if required in an emergency such as a break in a trunkmain or pump failure.

For performance reporting purposes the Corporation reports against the 1996 NHMRC/ARMCANZ Australian Drinking Water Guidelines. The guidelines specify both chemical/physical and microbiological quality targets to be met and imposes standards for water quality that are considered safe for people to drink over their full lifetime. As such they are based on a percentage compliance regime rather than absolute figures.

The guidelines include a range of characteristics that can be found in water, recommended sampling frequencies and locations and give a guideline figure for each characteristic. Whilst results of the more frequently measured characteristics are included in the report, the Corporation tests for a large number of characteristics that are not routinely reported. A summary statement of the range of characteristics tested and compliance with guidelines is given in Appendix C.

The Operating Licence stipulates that the key guidelines parameters must be met on a Regional basis, not just a total Corporation basis. This ensures greater uniformity of results across the Corporation. The three regions for which results are reported are Central (Newcastle Council area less Beresfield/Tarro), Southern (Lake Macquarie Council area) and Northern (Maitland/Cessnock/Port Stephens Councils plus Beresfield/Tarro).

Microbiological Water Quality

The key measures of the microbiological quality of drinking water as specified in the Australian Drinking Water Guidelines prepared by the National Health and Medical Research Council (NHMRC) and the Agriculture and Resource Management Council of Australia & New Zealand are the percentage of samples in a twelve (12) month period that are free of total coliforms or thermotolerant (faecal) coliforms. The requirement is for at least 95% of samples to be free of total coliforms and at least 98% of samples to be free of thermotolerant coliforms. For compliance purposes under the operating licence these requirements must be met in a financial year for the total Corporation and for each of the three regions.

The coliform group of organisms is generally accepted as the most suitable set of organisms to indicate faecal contamination. Although as a group they may not be exclusively of faecal origin, they are present in very high numbers in the faeces of warm-

blooded animals. They are relatively easy and inexpensive to detect and have similar survival times to that of pathogenic bacteria. Monitoring of specific bacterial, viral and protozoan pathogens is usually complex, expensive and time consuming and may fail to detect their presence. It may take weeks to determine whether a sample contains a particular pathogen and as such the indicator organisms are used as the primary measure of microbiological quality of drinking water. Coliforms are the most sensitive, but least specific indicator group for faecal contamination. Water contaminated with faeces will always contain coliforms, but some coliforms also occur naturally in soil and vegetation. Coliforms may sometimes be present in water in the absence of faecal contamination. The presence of coliforms is thus suggestive, but not conclusive evidence of faecal contamination.

Thermotolerant (faecal) coliforms are a subset of coliforms and are found in the intestinal tract of humans and other warm-blooded animals. They are therefore a much more specific indicator of faecal contamination than total coliforms being much more likely to have originated in the gut. It is for this reason that the compliance for faecal coliforms is stricter than for total coliforms.

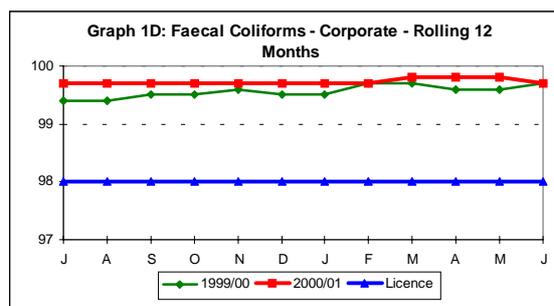
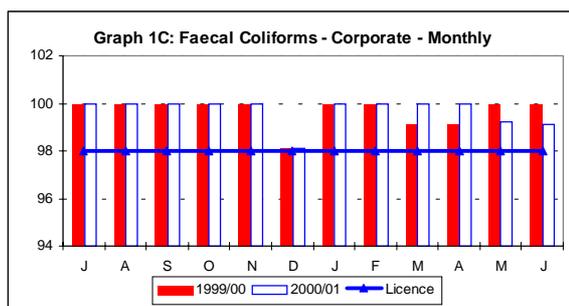
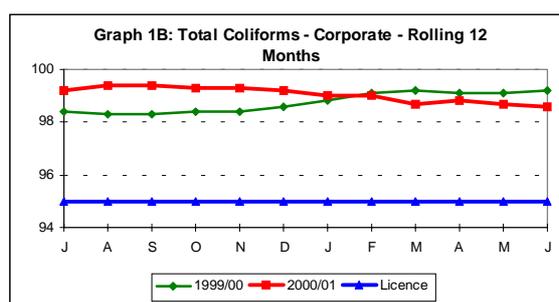
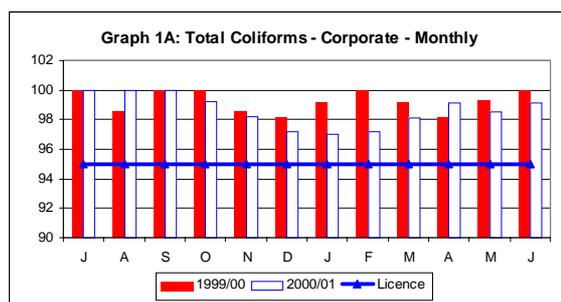
For total coliforms the guidelines specify at least 95% of scheduled samples (as distinct from repeat or special purpose samples) contain no coliforms. For thermotolerant coliforms the guidelines specify at least 98% of scheduled samples (as distinct from repeat or special purpose samples) contain no thermotolerant coliforms. For compliance or assessing performance purposes, the guidelines specifically state that performance can be regarded as satisfactory if these requirements are met over the preceding twelve (12) months. It should be noted that there is no compliance measure for daily, weekly or monthly purposes; it is over a twelve (12) month period. For monitoring purposes the number of samples required to be taken are nominated also within the Guidelines and are dependent on the population served.

The current guidelines do not specify at what level a positive result could cause a concern. As such, from a guideline point of view any positive sample is included when assessing annual compliance. For operational purposes the Health Department have requested notification if a total coliform count in excess of ten is recorded. This is consistent with the practice in other major cities within Australia, some of which still consider total coliform counts up to 20 as not being an exceedance. It should also be noted that the Health Department have also requested notification of **any** positive faecal coliform result recorded from our scheduled samples as well as notification of any positive protozoa result.

In the event of a positive sample being recorded, protocols that are adopted are as follows:-

1. Health Department is notified if it is within the notifications required by Health;
2. A repeat sample is initiated immediately the positive is identified and an investigation is undertaken to identify possible causes of contamination eg. Check operation of upstream chlorinators. If the repeat sample again returns positive, then disinfection is increased and a full sanitary survey of upstream facilities is undertaken, eg the integrity of reservoirs and high level tanks is assessed to investigate possible sources of contamination.

Corporate Results



Note 1: Rolling 12 months result represents the overall Corporation performance for the twelve month period to the end of the month for which data is being presented.

Graphs 1A, 1B, 1C, and 1D above, show respectively the corporate monthly and rolling twelve months total coliform results, and monthly and rolling twelve months faecal coliform results.

Results for June show that 99.1% of samples (107 out of 108) had 0 total coliforms and 99.1% (107 out of 108) of samples had 0 faecal coliforms.

With regard to licence performance the rolling twelve months are a better indicator of compliance. The rolling twelve months results were 98.6% for total coliforms and 99.7% for faecal coliforms, which represents a high level of compliance.

Graphs 3A - 3D, 4A - 4D and 5A - 5D showing respectively the monthly TC results, rolling twelve month TC results, monthly FC results and rolling twelve month FC results for Central, Southern and Northern Regions are attached as Appendix A.

The graphs 1A - 1D above, and the corresponding graphs in Appendix A, show the various Corporate and Regional results.

The following table shows the actual counts recorded where positive sample results occurred during the month as well as the results of the resamples.

Summary of Positive Sample Results

Date	Region	TC results	FC results	Resample Result	
				TC	FC
13/06/01	N	1	1	0	0

One sample from Northern region returned a low positive result. While inspections were carried out, no apparent reason could be found for the positive results. Manual dosing of this reservoir has occurred and resample results taken. The resample returned a negative result. The Department of Health were advised of the results.

Blue Green Algae

The Corporation also routinely analyses its raw water in surface storages (ie Chichester and Grahamstown Dams) for levels of blue-green algae. The raw water results for blue-green algae are used as an indicator as to whether or not additional treatment processes need to be activated. This practice is in accordance with a national alert level system. This system of alerts has three levels. Basically, the levels and the responses required at these levels are as set out below:

Alert Level 1

This level is triggered when counts of blue-green algae are in the range of 500 to 2,000 cells per millilitre of water. The protocol for Alert Level 1 is to increase the frequency of monitoring if the subsequent follow-up sample from a test returning a count in the 500 to 2,000 range shows a continuing upward trend.

Alert Level 2

This level is triggered when counts of blue-green algae are in the range of 2,000 to 15,000 cells per millilitre of water. Once counts enter this range, the protocol requires the commencement of testing for blue-green algae toxins as well as for the cells themselves along with the commencement of a health risk assessment. The protocol requires that if three consecutive readings are obtained in this cell count range additional water treatment processes (eg the use of activated carbon) should be implemented.

Alert Level 3

This level is triggered at counts greater than 15,000 cells per millilitre of water. The protocols call for notification to health authorities, media releases to the public, and again a further assessment of health risks. If additional water treatment processes have not already been implemented, this would occur at this time. The protocol also requires consideration of withdrawing the use of the affected source if there is not a capacity for treatment for the removal of potential toxins.

Blue green algae levels in both Chichester and Grahamstown were at very low levels during June as a result of the high rainfalls recorded recently.

The approach followed by the Corporation using the national alert level system is in accordance with the guidelines set down by the NSW State Algal Co-ordination Committee for response to results from blue-green algae testing.

Protozoan Monitoring

Results obtained for protozoan testing during June are consistent with all results obtained from past testing. All previous raw water results have either been clear or at low background levels. June results for both Grahamstown and Chichester Dams continued this trend. All water supplied to customers was clear of both Cryptosporidium and Giardia.

It should be noted that United States Environmental Protection Agency data indicates that chlorine at our normal dose levels is effective in combating Giardia (a fact supported by NSW Health) but is ineffective for Cryptosporidium. Cryptosporidium is dealt with through a multi-barrier approach incorporating catchment protection, controlled refilling of Grahamstown by means of water quality testing before pumping, long detention times in storage, filtration and water quality monitoring. A summary for cryptosporidium and giardia test results of raw (untreated) and treatment plant water is included in the appendices to this report.

Chemical/Physical Water Quality

Compliance for chemical/physical water quality requires that results for 12 key parameters and six non-key parameters are within specified guideline figures. Results for the 12 key parameters are reported each month. Since testing for the non-key parameters is required less frequently under the licence, the results for these parameters are only reported on a three monthly cycle.

For each of the 12 key parameters the Corporation must achieve compliance against the guideline values both Corporately and also in each of the three geographic regions (Southern, Central and Northern). Since fewer samples are taken for the five non-key parameters the Operating Licence only requires compliance against guideline values for these on a Corporation wide basis.

Table 1 below gives the results for the 12 key parameters nominated in the Operating Licence. For each parameter the table includes the following information:

- Mean result of all samples taken for the month
- Mean result of all samples taken for the last 12 months
- Current licence status against guideline values
- Guideline value to be assessed against
- Whether the parameter is an aesthetic or health parameter

Table 1 gives a summary of the Corporate results for these parameters. A breakdown of the regional results for the key parameters is attached as Appendix B.

Key Parameters

Table 1: Corporate Results

	Monthly Mean	12 Mths Mean	Current Licence Perf #1	Guideline #2	Remarks
pH	7.8	7.8	7.8	6.5 - 9.2	Aesthetic
Colour	5.0	5.0	5.1	15 HU	Aesthetic
Turbidity	0.5	0.5	0.5	5 NTU's	Aesthetic
Chlorine	0.4	0.4	1.0	5 mg/L	Health
Aluminium	0.038	0.081	0.085	0.2 mg/L	Aesthetic
Copper	0.05	0.05	0.08	1 mg/L	Aesthetic
Fluoride	0.85	0.82	1.02	1.5 mg/L	Health

Iron	0.04	0.04	0.05	0.3 mg/L	Aesthetic
Lead	1.00	1.09	1.95	10 ug/L	Health
Manganese	0.01	0.01	0.04	0.1 mg/L	Health
Zinc	0.020	0.021	0.021	3 mg/L	Aesthetic
THMs	57.2	57.9	106.9	250 ug/L	Health

Note 1: Current licence performance is a statistical calculation using actual results to give confidence that even allowing for variability in results, the licence requirement is still being achieved.

*Note 3: When comparing actual performance with the guideline value compliance is achieved if the actual result is **less than** the guideline values listed except for pH which must be within the specified range.*

Results in Table 1 show clearly that over the last 12 months the Corporation has achieved compliance with all of the guideline values for the 12 key parameters.

The guideline values of chemical parameters are set by the National Health and Medical Research Council (NHMRC). The values are '**life time consumption**' values meaning this amount of each parameter could be consumed every day of a persons life without adverse affects. Minor short-term exceedances over these values are not considered to be a health risk.

It should be noted that some chemical parameters are monitored for **health** reasons while others are monitored for **aesthetic** reasons.

As indicated above, there are 12 key parameters that the Corporation routinely monitors as part of its water quality compliance programme. Further details on a number of these parameters eg copper, chlorine, aluminium etc in drinking water supplies, are available on the Corporation's web site at www.hunterwater.com.au.

During June one chemical sample exceeded the guidelines for water quality. The exceedance was for an aesthetic parameter.

One sample exceeded the guidelines for chemical quality.

Date	Region	Analyte	Result	Guideline
26/06/01	Southern	Iron	0.36 mg/L	0.3 mg/L

As part of the Corporation's Operating Licence it is required to test and report on a further six physical/chemical parameters which are termed 'non-key'. Testing is done less frequently (monthly) for five of these parameters and at fewer sample points than for the health related microbiological testing and the twelve 'key' physical/chemical parameters. (e.g. chlorine, aluminium, iron and lead). These five non-key parameters are reported in Table 2 below. In addition the Operating Licence requires quarterly testing for pesticides/herbicides. Reporting for the non-key parameters is done on a Corporation basis rather than on a Regional and Corporation basis as for the other parameters. This is in accordance with licence requirements.

Table 2 below gives a summary of these results for the year to date. These results show that all non key parameters are complying. With regard to pesticide/herbicide testing, all results obtained have been below detection limits.

Table 2: Non-Key Parameters

	Corporate			Licence Requirement	Remarks
	3 Monthly Mean	Performance Last 12 Months #1	Current Licence Performance #2		
Ammonia	0.02	0.02	0.03	0.5 mg/L	Aesthetic
Dissolved Oxygen	87.3	90.6	89.8	> 85%	Aesthetic
Hydrogen Sulphide	0.01	0.01	0.01	0.05 mg/L	Aesthetic
Nitrates	0.08	0.10	0.36	50 mg/L	Health
Nitrites	0.01	0.01	0.02	3 mg/L	Health

Note 1: Average of all readings for the last twelve months.

Note 2: Current licence performance is a statistical calculation using actual results to give confidence that even allowing for variability in results, the licence requirement is still being achieved.

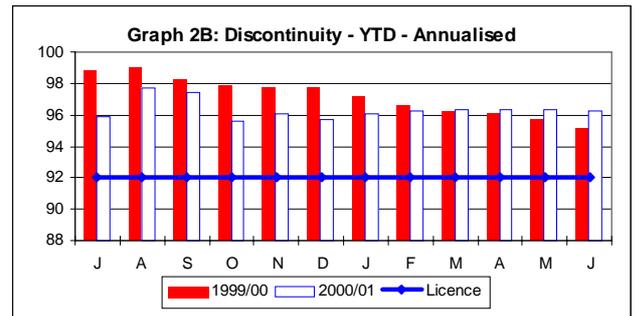
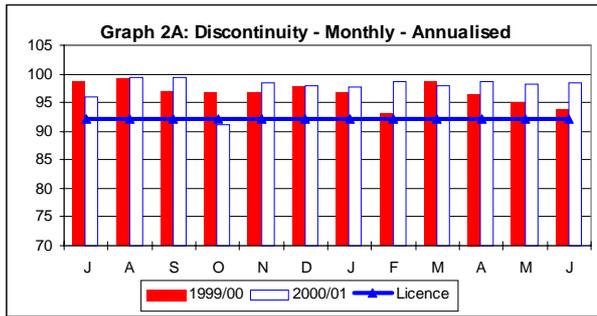
b Discontinuity

The Operating Licence requires that 92% of customers will not incur interruptions to their water supply for more than 5 hours duration in any licence year.

Graph 2A shows the monthly discontinuity results for the current licence period as a comparison against the results in the previous twelve months. The June result is that 0.12% (1.49% annualised) of our customers experienced interruption to their water supply of more than 5 hours. Graph 2B shows that the year to date figure of 96.2% of customers did not experience an interruption of more than 5 hours for discontinuity.

To control the extent of supply interruptions the Corporation monitors watermains with high levels of breaks. Each identified high break area is individually assessed to determine if replacement is economic. The Corporation reassesses replacement needs every three months and has an ongoing program of replacing poorly performing assets.

The distribution of water main breaks are listed below:



	Northern	Southern	Central	Corporate
Current Month	59	46	56	161
Year to Date	586	627	628	1841

c Low Pressure

The Operating Licence requires that 95% of water customers will not experience a verified low pressure incident of less than 20 metres head as measured at the water service meter. This requirement was achieved with 99.2% of properties not experiencing low pressure in June. The year to date result for the pressure indicator is now estimated to be 97.5%.

The low pressure count is calculated using 1,447 properties in known low pressure areas as a base and adding all low pressure complaints received whether confirmed or not. During June 52 complaints were received, of which none were confirmed.

d Taste and Odour

Routine testing of taste and odour compounds has been undertaken. Results are plotted in Appendix B. These results are recorded for the raw water supply, not water supplied to customers as the results are used to initiate responses if levels rise. Water supplied to customers is also monitored to ensure that levels in the treated water are acceptable to most customers. Additional processes are available at Grahamstown water treatment plant to mitigate the impacts of taste and odour incidents. These processes can be used when required in addition to substituting different sources of supply eg Tomago water if such incidents occur.

During June levels of taste and odour compounds remained at background levels.

Appendix D

Description of Categories for Complaints and Contacts

Title	Description of Complaint or Contact
Account Enquiry	Accounting/billing issues – eg service charges, usage charges, general charging issues, delays in processing information, property/account information,
Advertising	Complaint/contact in regard to publicity, brochures, media coverage, publicly available information relating to HWC, sponsorships, events
Asset Enquiry	Complaints or contacts made in regard to operation, performance, status etc of any HWC asset including sewer, water and property.
Statement of Available Pressure	Having regard to a customer applying for a Statement of Available Pressure from the Corporation
Backventing	Relates primarily to surcharge problem where backventing used to eliminate airlock in house drains
Hydraulic Plans/ Backflow Prevention	Having regard to application for an hydraulic plan assessment or the installation of a backflow prevention device (sometimes called dual check valves).
Build Over Sewer	Having regard to an application from a customer for approval to build or construct over a sewermain.
Capital Works	Having regard to capital works contractors working for the Corporation – copy of Capital Works Program is available at each Workgroup. Refer to Contracts Group for action. <i>Does not include contacts/complaints re maintenance contractors.</i>
Contractor Complaint	Complaints/contacts regarding maintenance contractors working on behalf of Corporation, including Operations Group. Includes restoration, timeliness, quality, workmanship. <i>Does not include Capital Works Contractors.</i>
Charter Low Pressure	Low Pressure incidents that have been identified under Customer Charter guidelines are logged as a “Contacts” in this category – customers not required to contact HWC. Customers experiencing problems who contact the Corporation may also be logged in this category as “complaints”
Charter Sewer Surcharge	Sewer Surcharge incidents that have been identified under Customer Charter guidelines are logged as a “Contacts” in this category – customer not required to contact HWC. Customers experiencing problems who contact the Corporation may also be logged in this category as “complaints”
Charter Water Discontinuity	Water Discontinuity incidents that have been identified under Customer Charter guidelines are logged as a “Contacts” in this category – customer not required to contact HWC. Customers experiencing problems who contact the Corporation may also be logged in this category as “complaints”
Compensation	Customers seeking redress/compensation as a result of damage arising from HWC operations. Includes minor property damage, clothing replacement following dirty water incident, plumbing or fitting repairs following supply interruptions, vehicle repairs as a result of damage by HWC asset.

Title	Description of Complaint or Contact
Discharge Factor	Complaint/contact related specifically to discharge factor as the basis for determining sewer usage charges – eg may relate to general concept of charge, or the particular DF percentage or band for the property.
Development	Relates to a development or subdivision of land/property. May relate specifically to Urban Development
Extension Sewer	Associated with applications from customers/developers to extend a sewermain to service a property, parcel of land or development.
Extension Water	Associated with applications from customers/developers to extend a watermain to service a property, parcel of land or development
Exemption	Customers seeking an exemption from charges &/or requesting concessions in the form of reduced charges.
Fencing Claims	Associated with applications from customers for fencing of a property usually neighbouring a HWC asset or parcel of land.
General	Limited use – only to be used where there is no other suitable category. <i>Entries to this category are reviewed to ensure they do not belong in other categories.</i>
High Consumption	Relates to high usage on customer account eg unidentified high consumption, possible leak in service. <i>Where meter over-read is thought to be cause it should be assigned to ME.</i>
Irregular Service	Relates to problem detected with house drains, fittings or water or sewer service eg the property may have private plumbing fittings that do not comply with appropriate Codes. <i>Does not relate to non-standard sewer or water – see US.</i>
IVR – Interactive Voice Response –	Specifically relating to use of the Australia Post Phone Payment Facility to pay accounts by credit card. <i>Does not include payments processed by HWC Call Centre Operators – see SC.</i>
Metering	Specific metering issues eg disputed averaging of usage, over-reads, meters not read, self-read cards, remote metering, exchange of meters. <i>Does not relate to specific billing issues which should be assigned to AC.</i>
Ministerial	Specific complaints/contacts from Minister or Local Member of Parliament.
Notification of Shutdown	Relates to notification regarding interruption of water supply eg, no notice, wrong dates, work not done, wrong time etc.
Odour	Odours from a HWC asset eg pump station, plant, vent, pipe.
Peg Sewer	Relates to a request for Hunter Water to peg the position of a sewermain on a property (eg prior to excavation/construction).
Pump Effluent/ CEPs	Relates to a connection to sewer where the design is a pump effluent or CEP system. May include complaints/contacts regarding the operation of a PE or CEP system, may also include applications for connection. <i>Other non-standard sewer connections may be assigned to US.</i>

Title	Description of Complaint or Contact
Privacy/ Information Protection	Relates to information held by HWC regarding customers and the protection of customer information, personal details and the customer's privacy.
Water Quality	Water quality issues, eg colour, taste, turbidity, clarity, odour, contamination.
Recovery Management	Arrangements or action in hand to recover debt – may include payment arrangement, mercantile agent action or legal action.
Customer Service Complaint or Compliment	Relates to the service provided by HWC staff eg rude, late, missed appointment, no response, knowledge, helpfulness, assistance. Includes requests for introducing new services. <i>Does not relate to Contractor Complaints - see CC.</i>
Sewer Junction	Relates to applications for customers for installation of a sewer junction.
Secret Leak / Leak Concealed from View	Relates to request for a concession related to a leak concealed from view (secret leak).
SSAC / HSP	Hunter Sewerage Project specific issues, eg sewer service access charge, construction program, charging, deferred payments etc.
Stormwater	Relates to stormwater intrusion, flooding, drains, illegal connections etc.
Tee & Valve	Relates to applications from customers for insertion of tee and valve in services
Non Standard Service	Related to applications for Non-standard sewer connections or temporary water services. Includes contacts/complaints regarding operation of a non-standard water or sewer service. <i>Does not relate to irregular house drains, fittings etc – see IR.</i>
Water Leak	Specifically relates to water seepage or leaks from an unidentified source eg, groundwater or damaged asset.

Appendix E

Compliance details of MoU with NSW Department of Health

HWC Actions Required	Comments	Conformance
3.1 A Joint Operational Group be established to discuss the broad principles, directions and policies and to: annually review progress on the implementation; to consider long term strategic issues and policies; to co-ordinate implementation of the MoU; to establish data-share programs and programs of investigation; and to provide recommendations to the Director General of NSW Health.	Liaison Committee meetings are held on a quarterly basis. The last meeting occurred on 3 June 2001. A letter was sent to the Director, Public Health Unit regarding results of the pilot program for removal of cryptosporidium at Grahamstown and Dungog WTP.	✓
6.1 The Corporation shall ensure that all drinking water it supplies is safe...and supplied in accordance with its Operating Licence.	A review of the Water Performance Reports for July 2000 to June 2001 indicated that licence targets were met.	✓
6.2 The Corporation's Operating Licence requires it to meet the health-related aspects based on the NHMRC/ ARMCANZ Australian Drinking Water Guidelines 1996 from the commencement of the Licence.	The Water Performance Reports state the requirements for water quality as outlined in the Guidelines. All licence targets were met.	✓
6.3 The Corporation shall investigate customer complaints regarding water quality.	HWC has a complaints handling policy in place, which outlines the management system for processing complaints.	✓
6.4 The Corporation shall consult with the Department in relation to planning issues that arise from changes in the NHMRC/ ARMCANZ Australian Drinking Water Guidelines from time to time.	No changes are currently in place. The 1996 Guidelines are the same as the 1994 draft Guidelines referred to in the Operating Licence.	N/A

HWC Actions Required	Comments	Conformance
6.5 The Corporation shall prepare an annual Water Quality Monitoring Plan.	The Water Quality Monitoring Plan was submitted to DoH for review on 28 June 2000. The Plan was reviewed and approved by DoH on 19 September 2000.	✓
6.6 QA for monitoring, sampling, testing and reporting.	Sampling and testing is carried out by Hunter Water Australia laboratory. The laboratory is NATA accredited, and has the appropriate quality systems. As of January 2001, the HWA laboratory is also NATA accredited for sampling.	✓
6.7 Event based monitoring, monthly monitoring, annual report and annual water quality improvement plan.	Monthly reports are posted on the Hunter Water Web page, and are available to DoH and to the public. The June monthly report is the annual report (refer to Appendix C).	✓
6.8 Fluoridation and sampling of all drinking water supplies, in accordance with the <i>Public Water Supplies Act, 1957</i> .	HWC indicated that the procedures are followed and that a fluoridation file is maintained. This file was not available for review.	✓
6.9 A Water Management Strategy shall be prepared and submitted to DoH, and reviewed every 5 years.	The final document was endorsed by DoH. The first review will be in 2005.	✓

HWC Actions Required	Comments	Conformance
6.11 On-line access to test results for regulatory agencies.	HWC and DoH have agreed to exclude this requirement in a meeting on 30 May 2000. Minutes of the meetings were viewed.	N/A
6.13 The Corporation has a role in ensuring public health protection.	The Water Monitoring Plan has been endorsed by DoH. Monthly progress reports indicate that operating licence targets have been met.	✓
9.3 An Incident Management Plan shall be developed and include an incident management contact point, procedures and protocols.	An Incident Response Manual is in place.	✓
9.4 All relevant personnel shall be trained to respond to and execute the Incident Management Plan.	Training was undertaken on 16 June 2000.	✓
11.1 A report shall be prepared for publication on an annual basis listing routine water quality testing conducted and results obtained in a format required by the Department.	Monthly reports are posted on the Hunter Water Web page, and are available to the public. The June monthly report is the annual report (refer to Appendix C).	✓

Appendix F

Compliance details of MoU with Department of Land and Water Conservation

N/A means that no actions were required during the audit period.

	HWC Actions Required	Comments	Conformance
2.1	Contact personnel shall be nominated from both parties.	Contact details are provided in Attachment A of the MoU.	✓
2.2	A Liaison Committee shall be established and meet twice per year.	HWC advised that it complied.	✓
3.2	Data and information shall be provided by HWC, as outlined in the Water Management Licence.	Reports are provided to DLWC, as required by the Water Management Licence. Annual summary reports are required by 31 August of each year. At the time of the audit, the 1999/2000 reports were viewed, as the 2000/2001 were not available.	✓
3.3	The Water Management Licence and Plans will be reviewed at 5-yearly intervals.	The first review is scheduled to be completed by 2003.	N/A
3.6	This clause gives reference to Clause 6.4 (should read 5.18) of the Water Management Licence (WML), which requires HWC to produce a demand management strategy each year. Certain initiatives are also outlined regarding unaccounted water and reducing leakage levels.	Under the WML the report is due in August 2001, which is outside the period covered by this audit. Conformance with this requirement should be reviewed by the next audit.	N/A
5.1	HWC has been authorised by the Director-General to exercise his functions under Parts 3 and 5 of the <i>Hunter Water Board (Special Areas) Regulation, 1997</i> from 20 April 2000. HWC is required to provide an annual report on its performance for submission to the Regional Director Hunter, DLWC.	HWC Rangers provide monthly reports to Strategic Operations. The annual HWC Rangers report was prepared on 6 August 2001. Conformance should be reviewed in the 2001/2002 operational audit as it is outside the period covered by this audit.	N/A

Appendix G

Compliance details with Water Management Licence

N/A indicates that no action was required during the audit period.

HWC Actions Required	Comments	Compliance
4. Operating Conditions		
4.3 HWC must maintain a flow averaging 14ML/ day in the Chichester River in accordance with the Chichester Dam operation requirements specified in the Williams River Flow Management Plan.	This is being undertaken as part of the operating procedures.	✓
4.8 HWC must meet the requirements of NSW Dams Safety Committee and of Local Emergency Disaster Plans for flooding at Chichester and Grahamstown Dams. Surveillance reports for storage works and the Committee's response must be provided to DLWC.	HWC advises that the Standard Practice Instruction for Operation, Maintenance Safety Review and Surveillance for both Dams were prepared in July 1998 and were distributed to relevant external agencies. These reports shall be reviewed within 5 years of the original date of preparation.	✓
4.10 Operational Monitoring of Groundwater shall be undertaken in the Tomago Special Area.	Results of the monitoring were viewed and comply with the requirements of the Clause.	✓
4.12 If the water table of two or more wells fall below the levels nominated in Section S3.1 of Schedule 3, HWC must advise DLWC and increase monitoring.	This did not occur	N/A
4.13 If the spatially weighted mean water table of the wells measured once every month in accordance with 4.12(c) and 4.122(d) and listed in Section S3.3 falls to RL 1.0 meter AHD or below, HWC must inform DLWC.	This did not occur	N/A

HWC Actions Required	Comments	Compliance
4.14 Should salinity levels in any of the seven salinity observation wells monitored increase by more than the limit specified in Section 3.4 (b) of Schedule 3, HWC shall inform the Regional Director of DLWC, who may amend monitoring and/ or extraction conditions.	Three of the seven wells triggered non-conformance in September 2000. HWC informed DLWC in writing October 2000, providing possible explanations for the increased salinity levels. HWC requested that the monitoring conditions not be altered.	✓
4.15 HWC shall undertake operational monitoring in the Anna Bay Special Area in accordance with Sections S3.5 and S3.6 of Schedule 3.	Results of the monitoring undertaken in accordance with S3.5 S3.6 were reviewed.	✓
4.16 HWC may extract groundwater from the Anna Bay Special Area in accordance with Sections S3.5 and S3.6 of Schedule 3, under conditions set out in this section.	Extraction is currently under WML allowable rates.	✓
4.17 All data and records relating to operational monitoring in the Tomago and Anna Bay Special Areas must be maintained in a form accessible to DLWC.	A data linkage system has been set up between HWC and DLWC.	✓
5. Monitoring and Reporting Conditions		
5.1 HWC must report any event, which results in non-compliance with the operating licence to DLWC.	One incident of possible non-compliance relating to salinity levels in the Tomago Special Area was triggered during 2000/ 2001 and reported to DLWC. HWC advised that the trigger may have been caused by faulty equipment.	✓

HWC Actions Required	Comments	Compliance
5.4 HWC must provide DLWC by 31 August each year with a statement to 30 June of changes to the configuration of the groundwater infrastructure in the Special Areas	A statement dated 31 August 2000 was provided to DLWC.	✓
5.5 HWC must maintain records, in a form accessible to DLWC showing quantities of water extracted each month from Chichester Dam, Seaham Weir and the Anna Bay Special Area.	HWC advised that this information is captured in the Water Statistics System on a daily basis. Records are accessible to DLWC via the data linkage system.	✓
5.6 HWC must maintain records in a form accessible to DLWC showing the amount for each month from each bore station and tubewell station in the Tomago and North Stockton Special Areas.	HWC advised that a spreadsheet is set up to collect this information. Records are accessible to DLWC via the data linkage system.	✓
5.7 HWC must maintain records in a form accessible to DLWC showing the daily inflows to Chichester Dam and direct releases from the Dam and estimated monthly natural flows to Grahamstown Dam including pumped inflows and the Campvale Pumping Station.	This information is recorded on a daily basis on the Water Statistics System. Records are accessible to DLWC via the data linkage system.	✓
5.8 HWC must provide to DLWC by 31 August each year a summary report of Seaham Weir operations.	A summary report on Seaham Weir operations was submitted to DLWC on 31 August 2000 in accordance with Clause 5.8 requirements.	✓
5.9 HWC must maintain a monitoring program to define the impact of water extraction for the North Stockton Special Area.	HWC does not currently extract from North Stockton.	N/A
5.10 HWC must maintain a Water Quality Monitoring and Reporting Program and must provide monitoring information in a form accessible to DLWC.	A Water Quality Monitoring and Reporting Program is in place. Refer to Section 8, which relates to the EMP	✓

HWC Actions Required	Comments	Compliance
5.11 Where monitoring reveals that contingency plan levels in the Water Quality Monitoring and Reporting Program have been exceeded or equalled, DLWC must be notified.	HWC advised that it has not exceeded any part of the WML to – date.	N/A
5.12 HWC must provide DLWC with a report, in plain English, suitable for release to the public on any flood levels at Chichester Dam that exceed State Emergency Service (SES) Alert Levels.	SES Alert Levels were exceeded on 6 March 2001 and on 6 May 2001. A report of each incident was submitted to DLWC within one month of the occurrence date, in accordance with the requirements in Clause 5.12.	✓
5.13 HWC must provide DLWC with a report, in plain English, suitable for release to the public on any flood flows over the Irrawang Spillway of the Grahamstown Storage.	Letters from HWC to DLWC giving details about flood events at Chichester Dam were received. No report has been viewed.	✓
5.14 HWC must publish a demand management strategy by 31 August each year. The strategy commitments must be incorporated in the EMP and reported in the Annual Environmental Report.	Refer to Section 6.8	N/A
5.15 HWC must provide DLWC by 31 August of each year a summary report of its compliance with conditions relating to groundwater in the Tomago and Anna Bay Special Areas for the year ending 30 June.	A summary report was submitted to DLWC on 31 August 2001.	N/A
6. Management Plan and Investigation Conditions		
6.1 HWC must undertake any supplementary studies outlined in Schedule 4.	An outline of the study to develop aquifer models for the Tomago and North Stockton groundwater system was submitted to DLWC in June 1999. The final report will be submitted in June 2004.	✓

HWC Actions Required	Comments	Compliance
<p>6.2 HWC must maintain current plans for:</p> <ul style="list-style-type: none"> • SES Alert Level events at Chichester Dam and Grahamstown Storage; • Pollution and blue-green algal management for Chichester Dam and Seaham Weir Pool; and • Long term drought management strategies. 	<p>“High Water Level Procedures” are in place for Chichester Dam and Grahamstown Storage. Pollution management is covered under the “Water Quality Monitoring Programs”. Blue-green algae is managed under the “Blue Green Algae Contingency & Operations Plan”. HWC advised that a “Drought Management Plan” has been compiled.</p>	✓

Schedules

1	<p>Schedule 1 outlines the water management works (surface water) at Chichester Dam, Bandon Grove Pipeline Weir, Seaham Weir and Grahamstown Dam.</p> <p>Schedule 1 of the WML requires that a fish passage be installed at the Bandon Grove Pipeline Weir within three years of the commencement date of the WML (ie by 26 December 2001).</p>	<p>HWC advised that it will be unable to meet the WML deadline of 26 December 2001. DLWC agreed to an extension of this deadline to 26 December 2002, recognising the complexity of this project.</p>	✓
2	<p>HWC is required to keep Groundwater Extraction Data for the Tomago Sandbeds, Anna Bay and North Stockton Special Areas.</p>	<p>The information is collected by HWC and is available to DLWC via the data linkage system.</p>	✓
3	<p>Schedule 3 refers to the Tomago and Anna Bay Special Areas Operational Monitoring Program and is linked to Clause 4 of the WML.</p>	<p>Monitoring is being carried out in accordance with the requirements of the Schedule.</p>	✓
4	<p>Schedule 4 refers to supplementary studies and is linked to Clause 6.1</p>	<p>Refer to Clause 6.1 in this table.</p>	✓

HWC Actions Required	Comments	Compliance
<p>5 Schedule 5 refers to two commencement variations relating to Clauses 4.3 and 5.9 of the WML.</p> <p><i>Clause 4.3</i></p> <p>Water release to the Chichester River in accordance with Clause 4.3 was to commence on commissioning of the hydro-electric outlet at Chichester Dam. The final date for commissioning was 31 March 2000.</p> <p><i>Clause 5.9</i></p> <p>Monitoring of the North Stockton Special Area shall occur only when groundwater extraction facilities are installed.</p>	<p><i>Clause 4.3</i></p> <p>The hydro plant was expected to be ready to commence commissioning around mid October 2000, almost 7 months after the final date outlined in the WML. The plant was eventually commissioned December 2000. Environmental releases commenced by 31 March 2000 as required.</p> <p><i>Clause 5.9</i></p> <p>No groundwater extraction facilities are installed in the North Stockton Special Area.</p>	<p>✓</p>

Appendix H

WWTW Compliance Details

WWTW	Compliance: Limit Conditions	Compliance: Other Conditions	Comments
Belmont	✓	✓	
Boulder Bay	✓	✓	
Burwood Beach	✓	Only half the load monitoring samples were collected	HWC is required to sample sludge being discharged from the plant. A method of sludge sampling was vetted by the EPA, but when the plant was audited, the sampling method was found to be in error of the load based licensing protocols. This sampling error had no negative affects on the effluent quality leaving the plant (this was only a fee calculation issue).
Stockton	✓	Administrative non compliance in activity scale which determines the administrative fee payable.	This non-compliance had no negative affects on the effluent quality leaving the plant (again, this was only a fee calculation issue).
Bolwarra (The plant has now been decommissioned)	✓	✓	The plant was decommissioned on 5 March 2001. It should be noted that there were three non-compliances at this plant in the current licence period (<i>ie. Oct 2000 to October 2001</i>). This was due to flood waters entering the plant and muddy water leaving the plant at the discharge point. The effluent quality was checked at the secondary clarifiers on these days and the quality was better than the 90%ile EPA limits except for one BOD value, which was measured at 37 mg/l (90% ile licence limit = 35 mg/l).
Branxton	✓	Administrative non compliance in activity scale which determines the administrative fee payable.	This non-compliance had no negative affects on the effluent quality leaving the plant (again, this was only a fee calculation issue).

WWTW	Compliance: Limit Conditions	Compliance: Other Conditions	Comments
Edgeworth	N/A (discharges through Belmont WWTW)	✓	
Farley	✓	✓	
Medowie	✓	✓	
Minmi	✓	✓	
Tanilba Bay	✓	Some borehole monitoring points were not tested, caused by change in licence conditions.	The sampling of bore holes at Tanilba Bay WWTW was done in accordance with the existing licence at the time. The new POEO Act Licence was submitted half way through the Licence period. The monitoring at the bores changed between licence (increasing testing for additional parameters of BOD and NFR), but HWC reported against the existing licence. The effluent quality leaving the plant during this period was good and the non-testing of bores had no adverse affect on the final effluent quality to receiving waters. In addition, testing of boreholes in accordance with the new protocols has indicated good effluent quality leaving the plant.
Cessnock	✓	✓	
Kurri Kurri	✓	✓	

WWTW	Compliance: Limit Conditions	Compliance: Other Conditions	Comments
Morpeth	✓	<p>Three non compliances recorded:</p> <ol style="list-style-type: none"> 1. bypass during connection of new WWTW 2. treated effluent overflowed in 3 occasions. 3. A reporting non-compliance regarding the old WWTW. <p>These problems have been corrected with the commissioning of the new WWTW.</p>	<ol style="list-style-type: none"> 1. The bypass of the old plant was necessary while the new plant's inlet works was being connected. The bypass occurred for around 6 hours. The bypass of the plant was discussed with the EPA prior to the work taking place. The bypass wastewater went to the maturation ponds which gave the water around 20 days detention, which is adequate for treatment for the volume of water bypassed. This bypass had no negative affects on the effluent quality leaving the maturation ponds. 2. The maturation ponds at the old plant were below the flood level. When the Hunter River was in flood, there was not enough head for the effluent to flow out of the plant. As the flood waters rose, flood waters entered the ponds and as the waters fell, effluent flowed out of the ponds over the pond walls. The flow of effluent over the pond walls while the Hunter River was in flood had no affect on the effluent quality leaving the plant. 3. This reporting non-compliance had no negative affects on the effluent quality leaving the plant.
Shortland	✓	✓	
Toronto	N/A (discharges through Belmont WWTW)	✓	
Windale	✓	✓	
Dora Creek	N/A (full reuse)	Administrative non compliance in activity scale which determines the administrative fee payable.	This non-compliance had no negative affects on the effluent quality leaving the plant (this was only a fee calculation issue).

WWTW	Compliance: Limit Conditions	Compliance: Other Conditions	Comments
Kearsley	✓	The volume limit was exceeded on a number of occasions. The EPA agreed to increase the licence limit.	The volume limit at this plant was slightly exceeded in the licence year. Kearsley is only a small plant (ie 1000 EP) with all of the effluent draining to an old mine/tailing dam. The mine/tailing dam receives run-off from a natural catchment. During heavy rain storms, the mine dam overflowed and broke the volume limit for the plant. The volume limit exceedance had no affect on the effluent quality leaving the plant.
Paxton	✓	✓	
Raymond Terrace	✓	✓	

Appendix I

Compliance details of MoU with EPA

HWC Actions Required	Comments	Compliance
3.4 Three liaison meetings shall be held at quarterly intervals to provide updates on key issues, licensing activities and environmental progress.	Minutes of these meetings were viewed.	✓
4.1 A 5-year Environmental Management Plan (EMP) shall be prepared, which incorporates environmental principles as outlined in Section 1.3 of the MoU. HWC will also seek input to the preparation and review of environmental targets of the EMP through its Consultative Forum, Customer Survey and any community comments received on its Environmental Annual Report.	The EMP audited is dated June 2000, before the MoU signed. HWC indicated that this action is being addressed in the June 2001 EMP (which was not reviewed as part of this audit.	N/A
4.2 The EMPs structure shall be incorporated into the Environmental Management System (EMS) and will ensure that: <ul style="list-style-type: none"> • Environmental programs and action plans are monitored and reviewed; • HWCs environmental performance is regularly assessed and reported on; and • Compliance with environmental legislation and objectives is achieved through internal environmental auditing. 	Actions have generally been completed. Refer to Section 7.7 if this report.	✓

4.3	<p>An Environmental Annual Report shall be prepared detailing:</p> <ul style="list-style-type: none"> • Performance against key environmental indicators; • Progress towards objectives and targets covered by the EMP, • Progress towards Environmental Improvement Plans; and • Energy management. 	<p>HWC prepared Environmental Annual Report which addressed the requirements.</p>	✓
5.1	<p>Open communication and consultation with the community will be provided through existing forums such as HWC's Consultative Forum, regular Open Board sessions and the EPA's Hunter Regional Environment Protection Community Consultation Forum.</p>	<p>Consultative Forum minutes, Open Board session agenda from July 2000 to March 2001 and various media releases were viewed.</p>	✓

Appendix J

Conformance with EMP Requirements

Conformance with EMP Requirements

The assessment of conformance with the EMP Objectives and Actions is given in the following sections. Conformance is reported as follows:

Yes: Conformance with EMP Action.

No: Non-conformance with EMP Action (eg. an action was not undertaken or is incomplete).

NA: The action was not relevant to this audit period.

Objective 1.0 - Water Resources

Introduction

Overriding Objective

To harvest, treat and provide a safe supply of water, with least environmental impact, at reasonable cost to the community.

Sub-Objectives

Five sub-objectives have been identified to achieve this overriding objective:

1.1 Catchment Management

1.2 Raw Water Quality

1.3 Water Treatment and Transportation

1.4 Research

1.5 Demand Management

Sub-Objective 1.1 - Catchment Management

Sub-Objective

To play a supporting role in TCM in the Corporation's area of operations and to continue to work closely with the Hunter Catchment Management Trust and Department of Land and Water Conservation and Local Councils.

Summary of EMP Actions on Catchment Management

EMP Action	Assessment Comments	Compliance
1.1.1 Continue to actively participate in the Williams River Total Catchment Management Committee by providing representatives and resources, where appropriate. Review progress annually.	Hunter Water was represented at 4 out of 6 meetings during 2000/2001. Issues which affect Hunter Water are reported to Strategic Operations	✓
1.1.2 Continue to support (where appropriate to Hunter Water Corporation) either financially, or by providing in-kind support, research proposals put forward by the Hunter Catchment Management Trust which are related to TCM issues in the Williams River catchment.	Hunter Water contributed \$500 to the Seaham Swamp Interpretive Signage Donation Fund, contributed to the preparation of a report on habitat linkages in the Mosman Swamp area, and provided 25% of the salary of the TCM Coordinator.	✓
1.1.3 Ensure Corporation's properties within the Williams River catchment are managed effectively and are consistent with best management practices. Review progress with management of properties with lessees each 12 months (April) and ensure that when leases are renewed best management practice requirements are incorporated.	<p>Hunter Water requires the successful completion of a "Property Plan" by all rural lessees. The planning process is coordinated by NSW Agriculture and lessees are required to attend regular information workshops on the requirements of the Property Plan, and to promote land management practices to minimise soil erosion and achieve improved productivity.</p> <p>In accordance with the action, Hunter Water audits the Property Plans annually to ensure they are consistent with best management practices and land management practices are in accordance with the Plan.</p>	✓

EMP Action	Assessment Comments	Compliance
1.1.4 Continue to maintain Corporation Rangers in the catchments to: <ul style="list-style-type: none"> ▪ Administer the functions of the Special Areas Regulation. ▪ Provide support, where necessary, to the Catchment Management Committee and Department of Land and Water Conservation. 	The Corporation employs six Rangers/Caretakers to administer among other things the functions of the Special Areas Regulations relevant to Hunter Water. Hunter Water's Rangers provide monthly and annual reports on their activities to Strategic Operations and also report on unusual events. The Rangers are active in land management activities on HWC property. Reports are also provided to the Catchment Management Committees and DLWC annually and by exception.	✓
1.1.5 Implement recommendations relating to Hunter Water's operations in the Williams River catchment <ul style="list-style-type: none"> ▪ Made by the Commissioner for Healthy Rivers where HWC is nominated as the Lead Agency. ▪ Where recommendations require joint action involving HWC under another lead Agency. 	The Williams River recommendations relate to the establishment of a Water Management Licence, contributions to landholders' costs of fencing and revegetation, feasibility of weir gates and mechanical aeration at Seaham Weir, flow releases and provision of fish passage. Hunter Water has completed most of these recommendations.	✓
1.1.6 Ensure compliance with Water Management Licence requirements.	Refer Section 6.11.	-

Sub-Objective 1.2 - Raw Water Quality

Sub-Objective

To monitor water sources to assess trends in raw water quality.

Summary of EMP Actions on Raw Water Quality

EMP Action	Assessment Comments	Compliance
<p>1.2.1 Ensure the existing monitoring program is sufficient to identify trends in water quality in the water supply catchments. Review the monitoring program and revise if necessary. The Williams River catchment will be reviewed annually (November each year). Brief update reports will be provided annually on Chichester and Grahamstown with full reports every 24 months.</p>	<p>The Catchment Monitoring Program is included in the HWC Monitoring Plan which is updated annually. The review takes into account information gathered throughout the year and includes the usefulness of the water quality indicators.</p> <p>Hunter Water provides annual water quality monitoring reports providing results of testing for the water supply catchments and has assessed the adequacy of the existing programs.</p> <p>The current monitoring covers all information necessary to allow water quality modelling of Grahamstown via a hydrodynamic model aimed to assess potential for eutrophication etc and hence establish pumping criteria rules that minimise the risk of algal blooms.</p>	<p>✓</p>
<p>1.2.2 Work co-operatively with other agencies collecting water data. Provide data to other agencies as required. Ensure all data is on linkage channel for DLWC.</p>	<p>All water quality data has been placed on a server so that it is freely accessible to DLWC. HWC also provides the Department of Health with Water Performance reports on a monthly basis.</p>	<p>✓</p>
<p>1.2.3 Continue to extract raw water of highest possible quality to minimise chemical usage during treatment. Review Balickera Operational Procedures after each major pumping event (5% Grahamstown storage capacity in a month) or maximum 12 monthly.</p>	<p>A formal review is held after each major pumping event. HWC has not extracted water from the Williams River due to low flows. An annual meeting was held in June 2001 where pumping events and phosphorous loads were discussed.</p>	<p>N/A</p>
<p>1.2.4 Work cooperatively with the Hunter River Management Committee and Tomago/Tomaree Groundwater Management Committee.</p>	<p>Hunter Water continues to provide information and participation at Committee meetings.</p>	<p>✓</p>

Sub-Objective 1.3 - Water Treatment and Transportation

Sub-Objective

To treat and supply water to customers to a standard which meets all water quality objectives while minimising chemical usage and environmental impact.

Summary of EMP Actions on Water Treatment and Transportation

EMP Action	Assessment Comments	Compliance
1.3.1 Continue monitoring of sludge storage lagoons to ensure minimal environmental impact on water catchments. Review every 2 years (December 2001).	Hunter Water monitors both fresh (ie as produced) and lagged (ie dried) sludges for standard chemical, nutrient, microbiological, pesticide and metal components. Results are compared with the EPA's Environmental Guidelines for waste management. The biennial review is scheduled for December 2000 (not 2001). The update of the Sludge Monitoring Program was completed in 2000.	✓
1.3.2 Continue to ensure chemicals are correctly stored so that spillages are minimised and properly contained if spillages occur. Carry out environmental audits in accordance with our auditing timetable.	Audits/inspections of water treatment facilities conducted by the Compliance and Review Group include a review of chemical storage at each site. Chemical spill response procedures are included in the HWC EMS and training is provided to relevant staff.	✓
1.3.3 Continue to explore, and implement where feasible, initiatives which improve the energy efficiency of our assets.	Initiatives to improve energy efficiency include optimising the operation of George Schroder WPS, investigation of mechanical mixers rather than an aeration system at Chichester Dam and a gravity bypass of Toronto WPS.	✓

Sub-Objective 1.4 - Research

Sub-Objective

To carry out applied research associated with water resource management.

Summary of EMP Actions on Research

EMP Action	Assessment Comments	Compliance
1.4.1 Continue to participate with other organisations in researching water quality issues within the Williams to identify causes of water pollution and to develop remedial actions. Review research needs in conjunction with the Williams River TCM Committee every 12 months.	<p>Each year, Hunter Water invites the TCM Co-ordinator to request funding for research projects which are considered to be of benefit to the Corporation.</p> <p>In 2000/2001, approximately \$2,000 was provided by Hunter Water for funding of a TCM research project (earthworm survey to reduce pasture derived nutrients) and \$500 was provided to the Seaham Swamp Interpretive Signage Donation Fund.</p>	✓
1.4.2 Continue to assist groups including CSIRO, University of Newcastle, Department of Land and Water Conservation, Landcare and Hunter Catchment Management Trust with research into Blue-Green Algae and appropriate water treatment technologies, review issues as they are identified in the Williams.	<p>There were no research programs requiring HWC assistance during 2000/2001 relating to the blue green algae and appropriate treatment techniques. However, in previous years, both research and targeted scientific consultancy investigations related to blue green algae, environmental needs or catchment management activities impacting on water quality, have been funded or co-funded by Hunter Water.</p> <p>HWC's preferred future strategy is to continue supporting research undertaken through the CRC where it is clearly of national significance. For issues specific to Hunter Water, the Corporation will continue to compile and assess appropriate research projects, prioritise and commission them at appropriate times. Currently, there are 10 technical projects, specific to blue green algae issues, being considered as possible future research projects.</p>	✓

Sub-Objective 1.5 – Demand Management

Sub-Objective

To assist in optimising the construction/augmentation of sources of water and water transportation systems by continuing the demand management program.

Summary of EMP Actions on Demand Management

EMP Action	Assessment Comments	Compliance
1.5.1 Continue to ensure price of water fully reflects all costs related to provision of water.	Water pricing and costs were reviewed for the IPART 2000 pricing determination (December 1999) for the Medium Term Price Path (2000-2004). This submission was discussed in the 1999/2000 audit and is current until 2004.	N/A
1.5.2 Actively encourage reuse of Hunter Water Corporation sewage effluent where environmentally and economically feasible (See 2.3.7 – Wastewater Treatment Section).	Hunter Water has further developed feasible reuse opportunities including crop and turf irrigation, industrial reuse, cleaner production initiatives and effluent application on woodlots. An Annual Report on Effluent Reuse was provided in 2000.	✓
1.5.3 Monitor trends in water efficient technologies and processes and promote appropriate awareness of benefits to our customers.	HWC is involved with the Newcastle City Council Water Conservation Committee, Master Builders Association, Sydney Water Corporation, Cleaner Production programs and commercial and industrial customers in relation to the investigation and promotion of water efficient technologies and processes.	✓
1.5.4 Assess the ability of the Corporation's SCADA system to monitor night flows for the purpose of identifying potential water leaks. Complete by June 2001.	Night flow analysis was undertaken for 3 locations using a Flow Analysis Model. Results have indicated that the method used for these locations is robust and HWC considers that this method can be used for the whole water supply system where SCADA information is available.	✓
1.5.5 Conduct research into current technology on leak minimisation that may be utilised by the Corporation. Complete by June 2001.	Hunter Water produced a Water Loss Manual in June 2001 which included research into leak minimisation.	✓

EMP Action	Assessment Comments	Compliance
<p>1.5.6 Develop a Leak Management Manual outlining strategies for monitoring assets and minimising water loss through leakage. Complete by June 2001.</p>	<p>Hunter Water has not developed a separate Leak Management Manual. Water accounting and management of water loss is included in the Water Loss Manual. Hunter Water should update this action to be reflective of current procedures.</p>	✓
<p>1.5.7 Continue to encourage the Corporations' non-residential customers to reduce water consumption through appropriate pricing, recycling initiatives and the control of unmetered use of water.</p>	<p>HWC is involved in a Cleaner Production program and has been developing effluent reuse initiatives for industry. A self-help checklist and information guide for reducing water consumption has been delivered to HWC's top 40 water users.</p> <p>For the larger non-residential customers virtually all costs are covered by the usage component of charges and a number of industries are using potable water substitution. The Corporation has also proposed to IPART to extend the lower tariff for supply of untreated (raw) water to industrial customers.</p> <p>The control of unmetered use of water is covered by the Water Loss Manual.</p>	✓
<p>1.5.8 Hold residential water consumption and encourage householders to accept responsibility for water conservation through appropriate pricing, by cooperating with national water conservation initiatives, and through appropriate publicity campaigns.</p>	<p>Hunter Water has adopted the current figure of 210 kL / household as the long term average target for the "hold residential water consumption" indicator. However, annual variation to the demand makes it difficult to determine the long term average. Hunter Water should develop a climatic model that will enable it to report against this target. The next audit should review progress against the revised indicator.</p> <p>Water conservation initiatives have included development of environmental demonstration homes. A water conservation campaign for print and radio media and assistance to the Master Builders Association and Council for water reduction programs for the residential sector.</p> <p>Hunter Water also adopts user pays pricing for water charges.</p>	N/A

EMP Action	Assessment Comments	Compliance
1.5.9 Prepare a progress report on demand management initiatives, particularly focusing on unaccounted for water issues by June 2001.	Progress was reported to the Board in June 2001.	✓

Objective 2.0 – Wastewater

Introduction

Overriding Objective

To collect, transport, treat and dispose of wastewater in a manner which conforms to environmental regulations and the Operating Licence in an environmentally responsible manner.

Sub-objectives

Three sub-objectives have been identified to achieve this overriding objectives:

2.1 Trade Waste

2.2 Wastewater Transportation

2.3 Wastewater Treatment

Sub-Objective 2.1 - Trade Waste

Sub-Objective

To minimise the entry to the sewerage system of all substances which cannot be effectively treated and ensure that Hunter Water adequately protects workers, assets and receiving waters from harmful trade waste substances.

Summary of EMP Actions on Trade Waste

EMP Action	Assessment Comments	Compliance
2.1.1 Continue to review risk assessments for all relevant major trade waste customers (August).	The risk assessment was revised in October 2000, not August, due to reallocation of staff to higher priority work.	✓
2.1.2 Ensure that auditing and monitoring programs for major trade waste customers are based on risk management principles (Review in November).	A trade waste risk assessment was conducted in November 2000 including sampling and inspections, management programs and permit terms.	✓
2.1.3 Ensure Trade Waste Guidelines for new trade waste customers are current and relevant to customer needs. Review biennially (December 2001).	The biannual review of the Trade Waste Guidelines is due in December 2001.	N/A
2.1.4 Where practicable, continue to ensure that wastewater sludges (biosolids) are suitable for reuse in accordance with Hunter Water's biosolids reuse target (See Wastewater Treatment Objective). Review annually (May).	Biosolids are tested and graded according to the EPA biosolids reuse classification system. A Biosolids Review was undertaken in May 2001.	✓
2.1.5 Continue to carry out Hunter water Corporations' free chemical collection service for householders. Review every 12 months and revise is necessary (February).	The Chemical Collection Service was reviewed in December 2000 and continues to be a viable campaign for HWC. HWC is seeking assistance from local Councils and the NSW Waste Board for shared responsibility for the service.	✓
2.1.6 Continue to carry out investigations into suspected trade waste problems within the sewerage system and report on the outcomes to Strategic Operations (ongoing).	There were 4 trade waste incidents during the year (fuel leak, odour problem, fish kill and poorly maintained oil separator) which were satisfactorily investigated by HWC. Grease trap surveillance program which identifies grease traps which may discharge trade waste without a permit is continuing.	✓

EMP Action	Assessment Comments	Compliance
2.1.7 Continue to manage the disposal of tankered wastewater to designated wastewater treatment works. Report on progress with this project to Manager, Corporate Planning and Government Regulation (ongoing).	Management of tankered waste discharges to WWTW and sampling of wastes for charging purposes is continuing.	✓

Sub-Objective 2.2 - Wastewater Transportation

Sub-Objective

To minimise the environmental impact or risk and maximise the efficiency of the wastewater transportation system.

Targets relating to compliance with Operating Licence requirements for surcharges are also included in this Objective.

Summary of EMP Actions on Wastewater Transportation

EMP Action	Assessment Comments	Compliance
2.2.1 Continue with the program of critical sewer inspections.	The process of critical sewer inspections is currently being reviewed. 25 km of sewers were inspected in 2000/01 with the inspection of another planned 10km delayed by contractual issues (weather, flows etc).	✓
2.2.2 Undertake flow gauging and modelling of all major established sewer systems in Lake Macquarie and Newcastle by 2000 and the remaining areas by 2001.	Flow gauging of the sewer systems is planned for completion in December 2001. Modelling of newer systems was not considered necessary as these are experiencing flows as designed.	✓
2.2.3 Complete Environmental Impact Assessments for relevant Hunter catchment areas, commencing with management plans for Lake Macquarie and Newcastle Harbour.	Environmental Impact Assessments for Newcastle (Burwood Beach) and Lake Macquarie have been completed to draft stage. A timeframe for completion of these and the remaining assessments should be included.	✓

EMP Action	Assessment Comments	Compliance
2.2.4 Further develop an holistic approach to odour control strategies with a view to implementing appropriate cost effective systems. Prepare an annual report on odours and publish results in the Annual Environmental Report.	Hunter Water is reviewing the odour issues of entire schemes rather than problem sites and has established performance based odour control contracts for four schemes. The annual report on odours was submitted to the board in April 2001 and results were reported in the annual Environmental Report. A total of 136 odour complaints were received due to the wastewater transportation system (there is no target for complaints from the wastewater transportation system).	✓
2.2.5 Continue to provide training to all relevant staff to ensure they are aware of their environmental responsibilities, and the procedures for responding to environmental incidents. Review every 12 months (August).	An audit of environmental training throughout the Corporation was conducted in November 2000 rather than August. A program of environmental awareness training is currently being conducted for relevant staff.	✓
2.2.6 Provide an annual report on overflows from pumping stations detailing the type of failures (energy loss, pump failure etc) and include results in the Annual Environmental Report.	The number of overflows from pumping stations was reported in the annual Environmental Report but not the type of failures as required by the action.	✗
2.2.7 Continue to explore, and implement where feasible, initiatives which improve the energy efficiency of our wastewater assets.	Energy efficiency initiatives have included a review of inefficient submersible pumps and inflow/infiltration strategies.	✓

Sub-Objective 2.3 - Wastewater Treatment

Sub-Objective

To provide a quality of treatment which is environmentally acceptable and to seek productive reuse of effluent and biosolids, where environmentally and economically feasible.

Targets relating to public odour complaints (60 per year), effluent reuse (13% of annual dry weather flows by 2005) and reuse of biosolids (90% reuse by 2005) are also included in this Objective.

Summary of EMP Actions on Wastewater Treatment

EMP Action	Assessment Comments	Compliance
2.3.1 Continue to consistently meet EPA licence requirements at the Corporation's wastewater treatment works.	Refer Section 7.	✓ Refer to Section 7
2.3.2 Continue an environmental monitoring program to monitor the impact of wastewater discharges on receiving waters.	Hunter Water continues to monitor the impact of wastewater discharges on receiving waters in accordance with the June 1998 Sampling Strategy.	✓
2.3.3 Proceed with planning and implementation of major upgrades of treatment plants at Raymond Terrace, Cessnock and Kurri Kurri and other initiatives under the Environmental Improvement Plan for inland wastewater treatment plants. Report progress to the Board as required.	Progress on the Upgrade of Inland Wastewater Treatment Plants was reported to the Board in August 2000. Progress includes decommissioning of smaller plants, planning, assessment and commissioning of new plants.	✓
2.3.4 Decommission the Stockton Wastewater Treatment Plant and outfall by mid 2002.	Stockton sewage flows will be transferred to Shortland WWTW to enable the decommissioning of the Stockton WWTW and outfall. The Board requested that the decommissioning of the Stockton WWTW be fast-tracked and completed earlier than the planned completed date of mid-2002. The design of the new scheme is currently underway and initiatives have been put in place to minimise delays to the project.	✓
2.3.5 Complete all major Hunter Sewerage Project schemes by 2002.	The planned completion date for the HSP was revised from end 2001 to end 2002 and Hunter Water is on target to achieve this.	✓

EMP Action	Assessment Comments	Compliance
2.3.6 In conjunction with the EPA Beachwatch program, continue to produce weekly reports in local papers on beach monitoring results and produce an annual report on compliance with guidelines.	Hunter Water now provides the results of the Beachwatch program to the EPA every 6 days and provides weekly reports to the local papers. These reports are also on the EPA's Web site. This action should be updated to reflect actual procedures.	✓
2.3.7 Continue to seek increase reuse or effluent where environmentally and economically feasible in accordance with stated target. Report annually on progress.	Hunter Water has further developed feasible reuse opportunities including crop and turf irrigation, industrial reuse, cleaner production initiatives and effluent application on woodlots. An Annual Report on Effluent Reuse was provided in 2000. The Corporation is currently recycling 10% of annual dry weather flows (towards the target of 13%).	✓
2.3.8 Continue with odour reduction strategy at wastewater treatment works in order to maintain complaints at a level not exceeding 60 per year. Report on progress annually.	Current odour control strategies include covering of inlet works and venting of off-gases to odour control units. A report on Odour Performance was provided to the Board in April 2001. A total of 40 odour complaints were received due to the wastewater treatment works (compared with the target of 60 per year).	✓
2.3.9 Maximise reuse of biosolids where environmentally and economically acceptable in accordance with stated target. Report on progress annually.	Hunter Water was able to recycle 100% of dewatered biosolids (and stockpiled biosolids) in 2000/2001 due to the establishment of tree plantation trials by State Forests. Hunter Water plans to develop an updated Biosolids Management Strategy. The action should be reworded to discuss beneficial reuse of biosolids.	✓
2.3.10 Continue to provide training to ensure that staff are diligent in activities that have an impact on the environment. Review training program ever 12 months (June).	A review of environmental training needs for Strategic Operations Staff was undertaken in June 2001 with all staff to receive either training or refresher training.	✓

EMP Action	Assessment Comments	Compliance
2.3.11 Continue to review developments in relevant research into innovative wastewater treatment technologies.	In November 2000, Hunter Water submitted a report on emerging technologies and an emerging technology matrix to the Capital Works Committee for consideration and comment.	✓
2.3.12 Continue to establish native vegetation screening to selected wastewater treatment works. Report on progress annually to Board Environmental Committee (every December).	Hunter Water is continuing the tree planting program for wastewater treatment works and other selected sites.	✓
2.3.13 Continue to explore, and implement where feasible, initiatives that improve the energy efficiency of our wastewater treatment assets.	Energy efficiency initiatives investigated by Hunter Water included an oil trial, off-peak transfer of effluent, effluent reuse and maintenance programs.	✓

Objective 3.0 - Community Consultation

Introduction

Overriding Objective

To demonstrate a sense of social responsibility by having regard to the interests of the community.

Sub-objective

One sub-objective has been identified to achieve this overriding objective:

3.1 Consultation, Information and Education

Sub-Objective 3.1 – Consultation, Information and Education

Sub-Objective

To consult with and educate the community to ensure people are well informed on Corporation's policies and plans; ensure that they have adequate input; and that the Corporation responds appropriately to their concerns.

Summary of EMP Actions on Consultation, Information and Education

EMP Action	Assessment Comments	Compliance
3.1.1 Continue to identify community concerns and needs through an effective community monitoring program, using tools such as customer surveys, phone surveys and the Corporation's Consultative Forum.	<p>Hunter Water continues to meet on a quarterly basis with the Consultative Forum. The corporation will, in future, be submitting the annual revisions of EMP to the Forum for review and comment prior to finalisation. The aim is to seek community input into the process of defining the actions in the EMP.</p> <p>From 2001, Hunter Water will undertake a biennial Perception Survey and a Telephone Satisfaction Survey (for customers who had contact with the Corporation). The telephone survey is designed to supplement the perception survey findings (which was previously conducted annually).</p>	✓
3.1.2 Continue to inform the community of the Corporation's activities and its impact on the environment. Utilise Open Board, media, open days, information packages and community newsletters.	<p>Hunter water activities are communicated to the community through the Open Board Meetings, media releases, information packages, newsletters and at community events. The Corporation's impact on the environment is reported mainly through the Open Board Meetings (open to the media and public) and the Annual Report.</p>	✓
3.1.3 Continue to report on specific environmental programs (eg through Open Board meetings) including the chemical collection campaign, Streamwatch, trade waste, beach monitoring results, effluent and biosolids reuse and other relevant initiatives.	<p>Open Board Meetings are used to report on specific environmental programs (Annual Environmental Report, Bathing Water Quality, Effluent and Biosolids Reuse). A Biosolids Reuse Newsletter was published in July 2000. It may be appropriate to develop a more accessible and widely used medium for reporting on these programs such as the Internet or a regular newspaper column.</p>	✓

EMP Action	Assessment Comments	Compliance
3.1.4 Continue to inform the community of the activities undertaken by Hunter Water Corporation in regard to effluent reuse, and progress against staged goals. Utilise Open Board, newsletters, promotional literature and videos, media, and guest speakers.	Effluent activities are reported at the Open Board meetings (annually). Volumes of effluent reused is reported in the monthly 'Aquarion' Newsletter. Progress against the effluent reuse target is reported in the annual Board report.	✓
3.1.5 Continue promotion of the Corporation's activities and facilities by providing tour services and speaker information to community groups, government departments, local schools, universities and TAFE.	Hunter Water conducted many tours of its facilities for schools and other community organisations.	✓
3.1.6 Host customer forums that focus on issues of common interest to key customer groups and Hunter Water Corporation.	No focus groups were held during 2000/01 (used on an as-needed basis only). Consultative forum meetings were held on a quarterly basis.	N/A
3.1.7 Continue to support Streamwatch in the Corporation's area of operations. Review school needs every 12 months (February).	Hunter Water provided sponsorship to Streamwatch Programs in 2000/01. Streamwatch school needs were reviewed in February 2001.	✓
3.1.8 Seek opportunities to be involved in environmental education programs in schools. (for example, sponsorship towards the Newcastle, Lake Macquarie and Port Stephens Councils Schools Environment Awards).	Hunter Water continues to support environmental education programs in schools and provides funding for school environmental awards.	✓
3.1.9 Maintain a sponsorship program which provides support to worthwhile environmental initiatives.	A sponsorship program was conducted in 2000/01 in support of Universities, community facilities, schools and community groups.	✓

Objective 4.0 - Stormwater

Introduction

Overriding Objective

To co-operate with other organisations and the community to improve urban catchment management in Hunter Water Corporation's area of responsibility.

Sub-objective

One sub-objective have been identified to achieve this overriding objective:

4.2 Urban Catchment Management

Sub-Objective 4.1 - Urban Catchment Management

Sub-Objective

To play a supportive role in urban catchment management in the Corporation's area of operations.

Summary of EMP Actions on Urban Catchment Management

EMP Action	Assessment Comments	Compliance
4.1.1 Continue to work closely with Throsby and Ironbark Creek TCM Committees.	Hunter Water has assisted the TCM Committees with issues such as surveys and reports on sedimentation in Throsby Creek and attends TCM Committee meetings.	✓
4.1.2 Cooperate with other TCM committees and Boards, where appropriate. Review participation on TCM Committees annually (November).	Hunter Water has assisted local Councils with preparation of Stormwater Management Plans as well as working closely with TCM Committees. Participation on TCM Committees was reviewed in November 2000.	✓

EMP Action	Assessment Comments	Compliance
4.1.3 Implement actions identified in Hunter Water's Environmental Improvement Program developed during the preparation of Stormwater Management Plans with Newcastle, Lake Macquarie and Cessnock City Councils. Work co-operatively with each council in the development of the Plans for each area over the next 3-5 years.	The Stormwater Environmental Improvement Program (May 2001) includes an Implementation Plan for the planned stormwater management actions. Many of these programs are ongoing and Hunter Water is progressing with the actions. The Implementation Plans should be reviewed regularly for progress and appropriateness.	✓
4.1.4 Participate in and sponsor relevant stormwater education activities organised by local councils.	Hunter Water has committed \$10,000 per year from 1999- 2002 towards the Stormwater Education in Newcastle Catchments Program and \$9000 to local Councils to assist with education campaign programs.	✓

Objective 5.0 - Corporate Responsibilities

Introduction

Overriding Objective

To carry out all of Hunter Water's activities in a manner which has minimal environmental impact in accordance with the principles of ecologically sustainable development.

Sub-objectives

Five sub-objectives have been identified to achieve this overriding objective:

- 5.1 Environmental Due Diligence
- 5.2 Environmental Assessment and Review
- 5.3 Environmental Auditing
- 5.4 Performance Evaluation and Reporting
- 5.5 Annual Revision of Environmental Management Plan

Sub-Objective 5.1 – Environmental Due Diligence

Sub-Objective

To demonstrate environmental due diligence in all Hunter Water's activities.

Summary of EMP Actions on Environmental Due Diligence

EMP Action	Assessment Comments	Compliance
5.1.1 Continue to conduct staff training and environmental awareness programs. Review programs and report progress to Board Environmental Committee by December every year.	<p>Training needs are primarily assessed by carrying out field inspections, interviews with relevant staff and environmental auditing. A training needs analysis was carried out by DLWC for erosion and sediment control training and internally to help develop a revised due diligence Course for Planning and Development staff and HWA Water Treatment employees.</p> <p>An audit of environmental training throughout HWC was carried out by the Compliance and Review Group (November 2000) to examine the types of training offered, contractual arrangements for training and the relationship to the EMS. As a result, oil/chemical spills training is included in the training provided to field staff.</p> <p>Environmental Awareness and Due Diligence Courses were conducted for Assets Planning staff in October 2000 and Planning and Development Division in May and June 2001.</p>	✓

EMP Action	Assessment Comments	Compliance
<p>5.1.2 Continue to effectively manage lands owned by the Corporation, particularly in relation to weed control, land contamination issues and rehabilitation where required. Review status by December each year and report on progress to the Board Environmental Committee.</p>	<p>Progress on land management issues was reported to the Board Environmental Committee in December 2000.</p> <p>HWC is progressively enhancing the appearance of treatment plants and other assets by providing vegetated buffer zones.</p> <p>Weed and feral animal control programs are continuing on lands owned or managed by HWC.</p> <p>A pilot study has been developed to form the basis of contamination assessments for decommissioned wastewater treatment works (to be completed August 2001).</p> <p>Progressive inspections of all HWC land holdings is being undertaken to identify any potential contamination that may be present with a significant risk of harm.</p> <p>Site contamination assessment is now a checklist item when all land is processed for sale. A lead contamination assessment was conducted at the Boolaroo office to establish the risk of lead related biohazard to staff working in the building.</p>	✓
<p>5.1.3 Implement the findings of the training needs analysis in relation to erosion and sediment control by June 2001.</p>	<p>A Training Needs Analysis was conducted by DLWC for Hunter Water and training was conducted in June 2001.</p>	✓
<p>5.1.4 Review and report on environmental incidents in accordance with the Environmental Management System (ongoing).</p>	<p>During the year a significant number of incidents occurred (107) mainly related to sewer surcharges.</p> <p>The environmental incidents were reviewed and reported to the Board Environmental Committee in December 2000.</p>	✓

EMP Action	Assessment Comments	Compliance
5.1.5 Review and revise (when necessary) environmental legislation and update the Environmental Management System accordingly (ongoing).	Section 4.2 of the EMS (Environmental Legislation (and other requirements) was updated in June 2001 to include information on the <i>Waste Minimisation and Management Act 1995, the Water Management Act 2000, the Environment Protection and Biodiversity Conservation Act 1999, the Dangerous Goods Act 1975</i> and minor amendments.	✓
5.1.6 Continue our commitments via our Memorandum of Understanding (MoU) with Sustainable Energy Development Authority (SEDA) in relation to energy efficiency opportunities. Report on progress annually in the Environmental Annual Report.	Energy management initiatives during 2000/2001 included the Chichester Hydro Scheme, WPS Control, mechanical mixers and monthly energy monitoring.	✓

Sub-Objective 5.2 - Environmental Assessment and Review

Sub-Objective

To assess Hunter Water's impact on the environment and develop strategies to minimise our impact.

Summary of EMP Actions on Environmental Assessment and Review

EMP Action	Assessment Comments	Compliance
5.2.1 Continue to assess and review areas of environmental risk for relevant Hunter Water activities. Report to the Board Environmental Committee on progress (by June each year).	The Environmental Risk Assessment Review was updated in June 2001 and reported to the Board Environmental Committee. Hunter Water reports on specific topics associated with areas of risk and those areas covered by the audit program.	✓
5.2.2 Continue to implement revised Environmental Impact Assessment Procedures including the Corporation's ESD checklist.	The use of the Green Slip system for consideration of environmental, economic and social aspects of construction or planned maintenance proposals was continued during the year.	✓

Sub-Objective 5.3 - Environmental Auditing

Sub-Objective

To assess Hunter Water environmental activities and determine their level of compliance with environmental legislation and corporate environmental objectives.

Summary of EMP Actions on Environmental Auditing

EMP Action	Assessment Comments	Compliance
5.3.1 Conduct environmental audits in accordance with the Corporation's auditing timetable which was approved by the Audit Committee. Progress against the audit timetable will be reported annually to the Board Environmental Committee (September).	Environmental Audits were undertaken in accordance with the audit schedule for 2000/01 apart from the Tomago WTP audit which could not be carried out as the plant was not running due to problems with the chlorination units. Progress and results were reported in December 2000. The audit schedule is reviewed and updated in June each year.	✓
5.3.2 Prepare a new audit timetable with budget every financial year (May).	The new timetable and budget were prepared in June 2001.	✓
5.3.3 Audit contents of Regulatory Monitor Folders quarterly (September, January, May).	Audits of the Regulatory Monitoring Folders were conducted in September/October 2000, January/February 2001 and June 2001.	✓
5.3.4 Conduct a comprehensive audit of the activities contained in the Regulatory Monitor in May and report the results of this audit to the June Executive meeting.	An audit of the Regulatory Monitoring Folders was conducted in June 2001. Monthly progress is reported to the Executive.	✓
5.3.5 Revise the Regulatory Monitor annually in accordance with the revised Environmental Management Plan (August).	The Regulatory Monitor was revised in July 2000.	✓
5.3.6 Review the Regulatory Monitor database annually in accordance with the revised Environmental Management Plan (August).	The Regulatory Monitor database was reviewed in August 2000.	✓

EMP Action	Assessment Comments	Compliance
5.3.7 Conduct biennial internal audits of the Environmental Management System. Report on results to the Board Environmental Committee (December 2001).	The biennial audit is due to be completed in December 2001.	NA

Sub-Objective 5.4 - Performance Evaluation and Reporting

Sub-Objective

To monitor and report on the performance of the Environmental Management System (EMS).

Summary of EMP Actions on Performance Evaluation and Reporting

EMP Action	Assessment Comments	Compliance
5.4.1 Upgrade (where necessary) the EMS and report on the performance of the EMS to the Board Environmental Committee annually (December).	The Performance against the EMS was reported to the Board Environmental Committee in December 2000.	✓
5.4.2 Prepare and publish an Annual Environmental Report, outlining the Corporation's performance against the Environmental Management Plan (August/September).	The 1999/2000 Environmental Report was published in August 2000.	✓
5.4.3 Review Environmental Performance Indicators on an annual basis (May) and report against key indicators in the Annual Environmental Report.	Environmental Performance Indicators were reviewed and updated in the June 2001 revision of the EMS. The Annual Environmental Report included performance against key indicators. Draft ESD indicators have been developed (June 2001) and are proposed for inclusion in the EMP.	✓

Sub-Objective 5.5 - Annual Revision of Environmental Management Plan

Sub-Objective

Ensure Environmental Management Plan activities are appropriate to drive environmental improvement.

Summary of EMP Actions on Annual Revision of Environmental Management Plan

EMP Action	Assessment Comments	Compliance
5.5.1 Each manager responsible for components of the Environmental Management Plan (EMP) is to revise the EMP annually in consultation with Manager Environmental Policy (May).	All sections of the EMP were updated by June 2001.	✓
5.5.2 The final revision of the EMP is to be completed by end June each year.	The final revision of the EMP was completed and presented to the Board in July 2001.	✓
5.5.3 Each manager responsible for the Regulatory Monitor is to revise the monitor annually.	The Regulatory Monitor Folders were reviewed monthly in 2000/01 and revised in June 2001.	✓