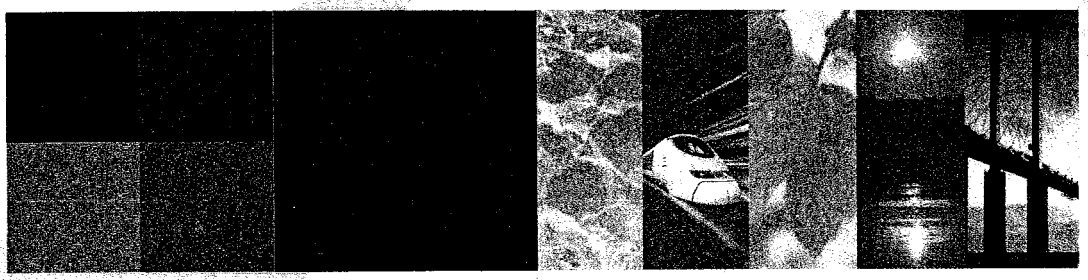
Halcrow Management Sciences Ltd

Review of System Performance Standards in Hunter Water Corporation's Operating Licence

26 November 2001



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1 Summary

The Independent Pricing and Regulatory Tribunal (the Tribunal) of New South Wales (NSW) appointed Halcrow Management Science (HMS) in September 2001 to carry out a review of the system performance and customer service standards in Hunter Water Corporation's operating licence.

The objective of the review was to advise and report to the Tribunal on appropriate standards and indicators for inclusion in Hunter Water's Operating licence.

The review was carried out over a period of ten weeks. It was based on discussions and consultation with Hunter Water and consideration of documents from the Tribunal, Hunter Water and other sources. Other stakeholders have made valuable contributions to the review both in private discussions, submissions and at the workshop held by the Tribunal on 20 November 2001. We have also taken account of the response to our report to the Tribunal on system performance standards for Sydney Water in March 2001 [1].

Because prices and standards are currently set at different times, cost benefit trade offs cannot readily be taken into account in the current regulatory framework. Our report suggests an alternative framework, option A, comprising three core standards, six service commitments plus a range of indicators that would allow such trade offs to be considered at the time prices are determined. We envisage it being implemented through amendment to the licence but there could be other means.

The core standards would be licence obligations and enforced in the same way as present licence standards. They would be omnibus standards focussed on fundamental dimensions of customer service. Recommended targets are given; these could only be changed by amendment of the licence.

The service commitments focus on more specific aspects of service delivery critical to asset management planning. Breach of a service commitment would result in regulatory redress but should not be a breach of the licence potentially leading to

[1] Review of System Performance Standards in Sydney Water Corporation's Operating Licence; Halcrow Management Sciences; 4 March 2001; http://www.ipart.nsw.gov.au/

revocation. We envisage the redress might include financial penalties, directions where failure to respond would be a breach of the licence or escalating the commitment to a core standard. A financial inducement for out performance would act as an efficiency incentive with the prospect of transferring the benefits to customers later. While we suggest some provisional targets, these would be determined as part of the price setting process after consideration of the costs and benefits of alternatives. Targets would be tougher than for core standards to reflect the lesser regulatory risk from failure.

Option B sets out our proposals if the existing framework is retained. We suggest eight system performance standards plus supplementary indicators that would enforced in the current manner. The incentive of this framework is for the business to just meet current compliance targets; if it delivers better service within current price limits, then it runs the risk of higher mandatory targets to its financial disadvantage. Targets, which can only be changed by amendment of the licence, would need to include headroom appropriate to the greater regulatory risk from failure.

Given that Hunter Water already performs well, we have recommended that where appropriate, core standards, service commitments and the related targets be written in terms of absolute numbers of customers receiving poor service rather than the percentage receiving acceptable service. This should focus attention on the impact of occasional service problems on individual customers.

A range of indicators is recommended that is common to both alternatives. These indicators are intended to inform and explain performance. In some cases, they are also geared towards making comparisons where recommended standards are not the same as at Sydney Water.

We now summarise our proposals for each service area.

(a) Supply and demand balance

We recommend that the supply and demand balance is regulated by requiring Hunter Water to seek the optimum solution via a least economic cost plan in which supply, demand and security of supply are given equal weight taking account of social and environmental objectives. Targets for demand management and security of supply would emerge from the planning process.

With our preferred option A, the targets would be determined as part of the price setting process and applied for the price path period as service commitments. If it

were decided not to pursue this alternative, then the targets would have to be introduced as system performance standards.

The proposed service commitments (option A) or system performance standards (option B) are for:

- The sum of metered consumption saved and leakage saved
- Probabilities of imposing water restrictions and time water restrictions are in force.

(b) Water service

Our preferred option A is for two core standard for water service interruptions and water pressure as follows:

- The number of properties incurring discontinuity of water services for more than 5 hours cumulative duration annually shall not exceed 13500 properties
- The number of properties not receiving continuous water pressure at the main tap above 15 metres with the system operating normally shall not exceed 1500.

We also recommend two service commitments for water service interruptions as follows:

- The number of properties that are affected by an unplanned shut off of water supply exceeding 5 hours
- The number of properties where the time since the last planned or unplanned interruption was ≤ 26 weeks.

Under option B, the core standard for pressure and service commitments for interruptions would be applied as system performance standards but the core standard for cumulative interruptions would be dropped.

(c) Sewerage service

Our preferred option A is for one core standard for sewage overflows as follows:

- The number of private properties affected by uncontrolled wet and dry weather sewage overflow incidents shall not exceed 6500 properties.

We also recommend two service commitments for:

- The number of uncontrolled dry weather sewage overflows, excluding directed sewage overflows
- The number of uncontrolled dry weather sewage overflow incidents, excluding directed overflows, where the time since the last overflow at the same location was ≤ 1 year.

Under option B, both the core standard and service commitments would be applied as system performance standards.

(d) Drainage service

We do not recommend any core standards or service commitments for the drainage service. Institutional reform is overdue and until then, we recommend that Hunter Water gathers data for an indicator or standard reflecting hydraulic capacity of its system in parallel with the moves towards stormwater quality indicators.

(e) Customer service indicators

We recommend customer service indicators for the following areas:

- Complaints
- Telephone calls
- Affordability
- Meter reading and account contacts.

In conclusion, we should like to record our thanks to the staff of Hunter Water and the Tribunal for their assistance during the review.

Halcrow Management Sciences

November 2001

2 Introduction

2.1 Appointment

The Independent Pricing and Regulatory Tribunal of New South Wales (the Tribunal) appointed Halcrow Management Sciences in September 2001 to advise and report on appropriate system performance and customer service standards for inclusion in Hunter Water's Operating Licence.

The key issues identified by the Tribunal are set out in its issues paper reference DP46 published in July 2001 and available on the Tribunal's website [2]. This report addresses those issues in accordance with the Tribunal's requirements.

The key issues identified by the Tribunal and specific requirements for our study are included in Appendix A.

2.2 Procedure

The review was based on discussions and consultation with senior management at Hunter Water. We also considered documents made available to us by the Tribunal and Hunter Water and others from published sources. Other stakeholders have made valuable contributions to the review both in private discussions, submissions and at the workshop held by the Tribunal on 20 November 2001.

We are grateful for the co-operation of Hunter Water and the other stakeholders.

2.3 Approach

In each area of a water business, it is the service standards that it is required or chooses to deliver that determine the cost of providing the service. Provided that service standards are set at levels that reflect customer needs, expectations and willingness to pay, they will also be a major determinant of customer satisfaction with the business.

A range of service standards is required to reflect the operational and administrative interface points between the business and its customers ranging from long term security of water supplies through to effectiveness in removing wastewater. Standards are also necessary to define the obligations of the business

[2] http://www.ipart.nsw.gov.au/

to the community it serves and to the environment; for example, those determined by an environmental regulator governing waste discharges

Our approach has been to seek to define the primary interface points with customers and the community through a minimum number of core standards and service commitments coupled with a range of supplementary indicators that are intended to explain rather than drive performance. For the administrative interface, we have suggested indicators only in line with our terms of reference.

As far as practicable, we have sought to adopt a cost neutral approach in line with our terms of reference. With sound data on current performance, options for raising compliance targets may be considered at the next review of prices and robust cost benefit trade off decisions made.

We have considered carefully our recommendation regarding system performance standards for Sydney Water, the Tribunals report to The Minister for Energy and the response of the Minister. In coming to our conclusions, we have sought to strike a balance between conformity to aid comparability and reflecting the particular circumstances of Hunter Water. The most significant differences are in our recommendations for security of supply.

2.4 Report

This report contains our advice to the Tribunal on appropriate core standards, service commitments and indicators for regulation of Hunter Water. Although the service commitments could be applied as system performance standards we recommend that they be applied in another way. Detailed definitions and a review of performance standards and indicators in use elsewhere are appended.

In this report, we have not tried to reflect the distinction in Hunter Water's licence between a customer and a consumer but have used the term "customer" throughout to include both.

3 Regulating performance

3.1 Introduction

The objective of this consultancy is to advise the Tribunal on appropriate system performance standards and indicators for inclusion in Hunter Water's Operating Licence and Customer Contract.

The appropriate standards and indicators depend on the objectives imposed on the organisation. The Hunter Water Act requires that the operating licence must include terms or conditions under which the Corporation is required "To provide, construct, operate, manage and maintain efficient, co-ordinated and commercially viable systems and services for supplying water, providing sewerage services and disposing of waste water." While this clause is essentially repeated in the licence, the efficiency, co-ordination and commercial viability of systems and services is not subject to any further terms or conditions.

The operating licence is also required to include terms or conditions ensuring that services meet quality and performance standards in relation to water quality, service interruption, price levels and other matters. This leads to the water quality requirements in schedule 3 together with the key operational standards in schedule 4 in respect of discharges from wastewater treatment works (WWTW), sewer surcharges and discontinuity and pressure of water services. In the part of the licence dealing with price regulation, a requirement to maintain sufficient resources to meet a probable occurrence of drought is imposed.

We note that whereas the command "shall" is used in respect of drought security and the WWTW discharge standards, the less imperative word "will" is used for the remaining standards in Schedule 4.

In the absence of any specific obligations in its Act or Licence, Hunter Water is required to act commercially, subject to the same social, environmental, economic and other constraints as any other business in NSW.

3.2 Objectives

The limited range of the current system performance standards does not provide an appropriate means of regulating a monopoly supplier through performance standards in relation to price levels, nor do they permit judgements to be made on the efficiency of the systems and services provided as required by the licence. Because of this, other methods have to be used by the Tribunal, largely in the context of price path determinations.

Quality and performance standards in relation to water quality, service interruption and price levels are necessary in a regulated monopoly industry to enable regulators to ensure that customers receive an appropriate service, to drive the business as a surrogate for competition and to understand the business. Supplementary indicators are also valuable to give broader understanding of the business. Standards enable an implied regulatory contract between business and customer to be defined in objective terms.

To effectively meet these requirements, we consider that a suite of standards and indicators is needed that:

- Focus the business on the key issues, concerns and customer needs and preferences
- Reflect the primary customer interface; that is the operational and administrative service delivery points
- Enable the effectiveness of investment to be tracked
- Are relevant and, so far as possible, acceptable to all stakeholders.

However the value of the standard or indicator should always be judged against the consequential costs.

3.3 Mandatory licence standards

Contravention of the Operating Licence is punishable by reprimand, monetary penalty or cancellation of the Licence. No process or appeal mechanism is established in the Hunter Water Act or Licence.

While the current range of operational standards is limited, their impact is substantial. Despite being in terms of "will" rather than "shall", their inclusion in the licence is interpreted by Hunter Water as a requirement that would lead to penalties for breach of the licence. In practice, although there have been instances of non compliance since the licence was introduced, these have not resulted in serious regulatory action. Nevertheless Hunter Water emphasised the importance it attaches to compliance with these standards; they are strong business drivers.

A strong driver has resulted in a risk averse business and politico-regulatory process; a significant margin of comfort between current performance and the minimum set by the standard is sought. In some respects this may be seen as a beneficial outcome but the cost consequences and benefits must also be considered. As we see it, compliance has come to rely upon a general sprit of co-

operation rather than a tough incentive regime, driving for both efficiency and effectiveness, under which strict penalties are imposed for failures.

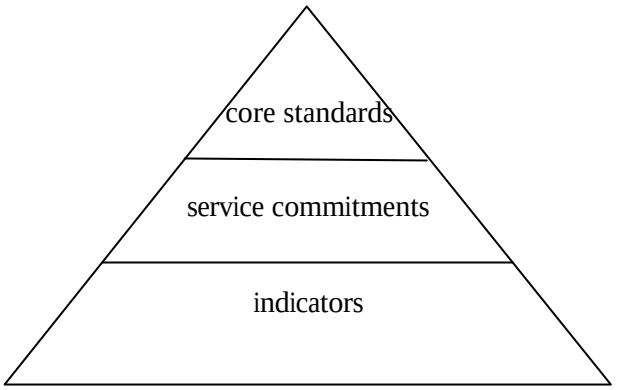
Establishing system performance standards as licence obligations means that changes can only be considered at a review of the licence. Cost benefit trade off decisions cannot be taken in the context of a price review without leaving prices and obligations unsynchronised.

When the licence is reviewed, standards cannot be raised above a cost neutral position as funding to deliver higher performance is not available. When prices are determined, they should be set to deliver existing standards because stricter standards cannot be enforced. Current compliance targets therefore become fossilised and the incentive is for the business to just meet them and no more. Hunter Water has illustrated this [3] by arguing that setting targets based on past performance penalises it for implementing performance initiatives in the past.

Mandatory standards are a feature of several water licences in Australia. Elsewhere they are more likely to be found in private sector participation arrangements where management of the water utility is outsourced under a competitive tendering procedure. Aside from environmental compliance for which breaches are subject to court action, the UK privatisation model does not use mandatory standards although poor performance can result in action at the discretion of the regulator.

3.4 Option A – core standards and service commitments

A different approach may be preferable to achieve the appropriate incentive and a better relationship between the business drivers and price setting process. This option envisages a regulatory pyramid consisting of three tiers:



[3] response to draft report, attachment B

Because of the requirements of clause 13 of the Hunter Water Act, it is essential that some core standards be retained as licence obligations. We suggest two standards for the water service and one for the sewerage service; more would be required if regulatory control were not effectively exercised over the full range of Hunter Water's activities by other means. Compliance targets for the core standards could only be amended at a review of the operating licence.

The recommended core standards focus on the overall primary customer impact of Hunter Water's water and sewerage services. While they will need to be considered within the asset management planning framework, these plans will be more specifically driven by the recommended service commitments.

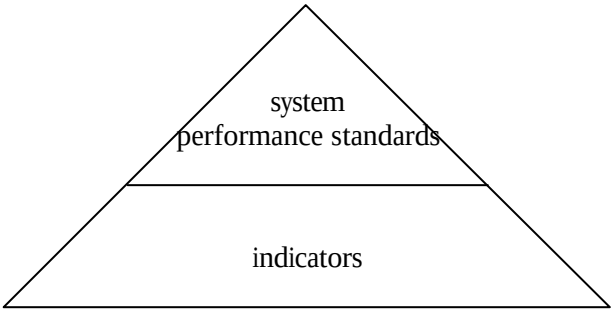
The second tier of the pyramid is a suite of service commitments that, together with the core standards, meet the objectives set out in section 3.2 above. In the context of a price review, costed proposals to meet defined targets would be sought from the business; to be an effective incentive, the number of service commitments should be restricted. The Tribunal could then consider the cost benefit trade off and in publishing its determination, set out the targets that the business is expected to achieve during the price path period. The targets do not necessarily have to be uniform through the period; for example if improvement is planned, then they might increase year by year in line with planned expenditure. The business would then report on achievement and be held accountable for meeting the targets.

The third tier would be a range of indicators designed to explain and complement the core standards and service commitments but not to drive the business.

We anticipate that changes to the licence will be necessary to implement this option which is possible in the context of the Tribunal's current review of Hunter Water. In the case of our recent review of Sydney Water, this option was not viable as the licence had recently been reviewed and Tribunal was considering only the system performance standards.

3.5 Option B – system performance standards

We appreciate that our preferred option A as described above is a significant step forward and there may be legal or other reasons why it is not practical to pursue it at present. The alternative way forward is a wider range of system performance standards in the licence consistent with the Hunter Water Act together with supplementary indicators in a two tier pyramid. This is the approach envisaged by our terms of reference.



3.6 Indicators

We recommend a range of indicators that would be appropriate to either option A or option B.

Indicators are valuable as they assist understanding and may also be used as an interim step towards standards where data is not available. It is sometimes suggested that indicators may become de facto standards. This is likely to occur where the standards do not adequately reflect the interests of customers leading to regulation by indicators and consequent uncertainty for the business. Where obligations are clear and comprehensive, regulators will focus on these and use indicators appropriately; clarity of obligations is the first step to business efficiency and effectiveness.

3.7 Implementation of service commitments

Standards or service commitments both need to be transparent and enforceable as well as meeting the tests suggested in section 4.3 below.

In formulating option A, we have assumed that the service commitments would be introduced by means of an enabling clause in the licence. However rather than failure to meet the target being a breach of the licence, we suggest that a range of responses should be available dependent on the nature of the breach. These might include:

- A financial remedy, exercised by the Tribunal in the price setting process in which case incentives for out performance may also be appropriate
- Directions by the Tribunal, breach of which could be a breach of the licence
- Powers to escalate the service commitment to a core standard.

A financial reward for exceeding service commitment compliance targets within the price limit set brings an efficiency incentive into the regulatory framework. At a subsequent price review, the gains can be transferred to customers either by locking in the achievement with a higher compliance target or reduction in prices to a level consistent with delivering the existing target.

It has been suggested that the Tribunal may be able to introduce transparent and enforceable service commitments by virtue of its own acts. The legal and regulatory advantages of the alternative routes should be explored if Option A is preferred.

We have drafted the proposed core standards, service commitments and system performance standards in "must" terms. In respect of service commitments, it may be appropriate to reconsider use of the word "must" dependent on how they are implemented.

It is important that flexibility for establishing and amending targets and possibly the range of service commitments, outside of a full or interim licence review is available.

3.8 Proposed targets

The proposed targets for standards have been derived from consideration of all the submissions and data provided by Hunter Water, and in our judgement, should be cost neutral in the short term, that is up to the next interim licence review. We have generally suggested provisional targets only for the service commitments. After consideration of the cost benefit trade off, these should be determined at the next price review for the subsequent price path period.

The implementation of Option A will lead to practical issues for the Tribunal to address when considering the price path determination process.

3.9 Reporting on performance

If service commitments are introduced, then it will be necessary to introduce a mechanism for reporting performance on an ongoing basis. The methodology should be extended to supplementary indicators. The data must be subject to independent audit to demonstrate that they are robust.

Regardless of the implementation mechanisms, we recommend that for the benefit of stakeholders, a single report covering core standards, service commitments and indicators should be compiled. The hierarchical approach proposed requires consideration of all three levels of data to give proper understanding of performance but the relevance of each level of data needs to be explicit.

3.10 Role of the customer contract

In our view, system performance standards, service commitments and supplementary indicators set out parameters on which the Tribunal and other stakeholders should regulate or evaluate the business. The customer contract should establish the obligations of the business to individual customers. The manner in which the business addresses its customers individually is a legitimate issue for regulators to consider in their evaluation of the business.

It will not always be practicable or in the interests of customers in general to aim for absolute compliance as the costs are likely to increase exponentially as this ideal is approached. The customer contract may also be seen as a means of giving appropriate redress where there are random service deficiencies or if it is prohibitively expensive to provide the normal service standards universally.

Redress could take the form of:

- Level payments for each event of poor service
- Larger fixed payment for serious service deficiencies
- Escalating payments if problems recur.

Payments of this sort are likely to be in addition to compensation for loss or damage, the principles for which may also be set out in the customer contract.

In deciding the appropriate option, the Tribunal may wish to consider the relationship between Hunter Water and its customers. Although not an area we focussed on, the evidence we came across during our review suggests a didactic relationship. The customer contract, including additional pressure through compensation payments, provides a means of focussing attention on customers.

3.11 Conclusion

The present regulatory framework applying to Hunter Water is a hybrid system. State control both as licensor and shareholder is retained alongside a licence of a more commercial nature. This raises questions of control, incentive and risk. The more control that is exercised by Government, the more responsibility it takes on itself for the outcome of key decisions. It is difficult in these circumstances to apply incentives for the business to improve its own efficiency that can later be transferred to customers emulating a competitive market place. Efficiency has to be driven in externally. Within this framework, financial risks are borne largely by customers but with state taxpayers bearing ultimate responsibility.

Given these constraints, we believe that our proposed option A is a sensible development. By setting challenging performance targets and holding Hunter Water accountable for delivering within its price cap, both customers and taxpayers should benefit.

4 Performance measurement and reporting

4.1 Introduction

In this section we discuss some matters of principle that have been raised by stakeholders and set out some parameters on which this report is based.

4.2 Definitions

There is no universally accepted terminology for measurement and reporting of output performance of a business. The key terminology that we have used in preparing this report is:

- A performance indicator is a defined output from a system measured and recorded on an appropriate scale
- A reporting threshold means a point on the scale that it is considered generally appropriate to attain and report compliance against
- A compliance target is a measured level of performance compared to a reporting threshold that the system is expected to deliver.

Indicators with both a reporting threshold and a target are drivers that the business is obliged to respond to. A business driver could be a core standard or service commitment with compliance failure a breach of the licence or alternatively a service commitment enforced some other way.

4.3 Objectives for standards and indicators

The Tribunal [4] has endorsed the principle that system performance standards should meet the following criteria:

- Be relevant to a core function of the business
- Measure a system output in objective terms with reasonable accuracy but without undue cost
- Be concise, unambiguous and understandable to all stakeholders.

[4] Review of Operating Licence for Hunter Water Corporation; Issues Paper; Ipart; July2001; http://www.ipart.nsw.gov.au/

We believe that this principle applies equally to core standards and service commitments as defined above.

4.4 Reporting thresholds

In suggesting a reporting threshold, we have sought to ensure that:

- They represent an output level that is acceptable to stakeholders in general and normally achievable without excessive cost
- The appropriate compliance target is less than 100%.

If a business always performs at or near 100%, over achievement cannot be quantified and trends will be concealed. However there will be circumstances where 100% compliance is the appropriate target, for example it would be inappropriate to set a target of less than 100% for compliance with a legal obligation.

4.5 Compliance targets

The risk of failing to meet a mandatory standard is a significant driver of the business and will lead to it seeking to operate with a margin of comfort to allow for exceptional events. However there will still be some risk of failure and this problem increases with smaller organisations. The compliance target therefore needs to be set with care to avoid unintended consequences. We note that many of the public submissions to the Tribunal argue that the current headroom is excessive.

In order to achieve the right balance, there are different potential approaches to dealing with extreme events.

- Hunter Water has suggested determining compliance with respect to three year rolling average. We do not favour this option because a rolling average confuses interpretation of performance as the impact of good and bad years continues after the event.
- Exclusion clauses are a better way of focussing effort on long term rather than transitory problems and avoiding undue effort being needed to mitigate the impact of rare events. Customers who have suffered as result of the extreme event may view them as unacceptable, particularly if the business is perceived to be at fault or not responding adequately. Drafting unambiguous definitions can also be a problem.
- The third option is to provide headroom in the compliance target.

We favour the use of exclusion clauses in some circumstances where unambiguous definition is practical to ensure that the business is focussed on the important issue. For example, we have excluded transitory problems due to main breaks and fire fighting in the pressure standard definition to focus effort on the system operating normally. Appropriate headroom is however necessary to allow some margin for rare event. The stronger the penalty for failure, the greater the argument for headroom.

4.6 Recording and reporting protocols

The definitions we suggest for core standards, service commitments and indicators are written in performance terms; the methods of measurement, data collection and reporting are not constrained. The business needs to establish appropriate recording and reporting protocols in order to ensure acceptable accuracy and repeatability. Reporting protocols should be concise and unambiguous, practical and auditable. The Tribunal should be involved in the development and satisfied that they are appropriate; this may involve technical review, perhaps as part of the audit process.

It is important that when making judgements on the basis of data, there is sound understanding of its accuracy. The data that is collected in not likely to be 100% accurate. As with all complicated processes the costs of achieving high levels of accuracy may not be justified by the relevant benefit. Nevertheless the highest appropriate accuracy in reporting of the data is an essential part of the regulatory process, for example to reduce the effects of data uncertainty when making time series or cross business comparisons.

In developing the reporting protocols, Hunter Water should be required to estimate the accuracy that it is likely to result provided that the methodology is being followed.

In the relevant appendices, we have indicated the accuracy that might be considered acceptable for standards and service commitments based on our experience of what should be achievable without excessive cost. We have not suggested accuracy requirements in respect of indicators.

4.7 Reporting and auditing

As a matter of principle, we recommend that Hunter Water should as far as practicable, be required to submit audited data to the Tribunal.

Our review exposed some minor differences between figures in audit reports and data provided by Hunter Water. On investigation, Hunter Water found that minor

adjustments had been made after the audit to reflect better data. The result is that the Tribunal and Hunter Water are working on slightly different data sets.

This highlights a deficiency of the current system for reporting performance and maintaining records that warrants further consideration. Pro formas for inclusion in the audit report showing report year performance alongside prior year data downloaded from the Tribunal's databases might be explored. The flexibility to amend data where significant errors are discovered should be retained.

4.8 Compliance and exception reporting

Current system performance standards at Hunter Water are written in terms of compliance reporting rather than failure reporting. Compliance reporting emphasises that the business provides a high level of service to the vast majority of its customers. However this is no comfort to the exceptions who receive poor service. The question therefore is whether reporting is intended to demonstrate the success of the business or focus it on the occasions when service is less than satisfactory.

In some cases where a business is seeking to deliver a step change in performance, then compliance reporting may be appropriate. Where a high level of performance has already been achieved and attention is largely geared to maintaining current performance, exception reporting draws attention to trends and peaks that might be overlooked with compliance reporting.

Given that Hunter Water is already performing well, our recommendation is that in general, core standards, service commitments and the related targets are written in exception rather than compliance terms.

4.9 Absolute numbers and percentage reporting

Reporting can be based on absolute numbers or percentages.

Various submissions to the Tribunal, for example that from the Total Environment Centre, support the use of absolute numbers arguing that they are more meaningful to customers to relate to and provide a greater incentive on the business to perform. They help ensure that those who receive lower service than the norm are recognised as customers, not as statistics.

Hunter Water has argued that setting compliance targets in terms of absolute numbers leads to a gradual tightening over time due to growth. Measured on a percentage basis this is factually correct. However a percentage target implies that it is acceptable that more customers will receive service below the reporting threshold over time. This, we suggest, is not acceptable. However it is

acknowledged that due to deterioration of assets, to meet an absolute standard would require a gradual increase in maintenance effort; alternatively it may be appropriate to adjust the compliance target upwards on occasion. Significant impact would only be seen in the medium to long term and would be obscured by the natural deterioration of assets.

We conclude that in most cases reporting should be on an absolute numbers basis.

4.10 Facilitating comparisons

In section 3.2 above, we suggested that standards and indicators are needed to enable regulators ensure that customers receive an appropriate service, to drive the business as a surrogate for competition and to understand the business.

It would be possible to extend and reinforce the present standards with regard only for known local circumstances; customer needs and expectations should but cannot be considered because objective knowledge remains sparse. While this would be an improvement, the above objectives would be better met if the Tribunal could make comparisons between different businesses. Several submissions, including those from PIAC and the Nature Conservation Council, support consistent reporting requirement to facilitate comparisons.

Comparative competition is a valuable surrogate for the market where as in the case of water utilities, there is little prospect of real competition. For a monopoly business it is a real, albeit indirect, pressure. The response of a business that is being compared unfavourably to its peers is sometimes to suggest that the comparison is not being made on a like with like basis or that it is a function of local circumstances or both. When businesses respond in this way, it is an indication that comparative competition is working. Other progressive businesses view comparative competition as a means of facilitating progress.

Comparative competition works best where there are a reasonable number of comparable organisations, for example schools and hospitals. It has worked well with the 20 water business in UK and even with just three in Melbourne, largely because of the similarities in size, operating environment and history. In NSW, there are only two licensed water businesses regulated by the Tribunal and these are of disparate size. Nevertheless, we believe that the facility for to make comparisons will be a valuable tool to the advantage of customers.

Comparable drivers and indicators will not be appropriate in all circumstances. Where they are appropriate, to facilitate comparison while reflecting local circumstances, we suggest that:

- So far as is practicable, definitions should be the same
- Reporting thresholds may need to be varied to reflect local circumstances
- Compliance targets should be set to reflect local circumstances
- Accuracy must be appropriate to the systems available, not driving the systems although poor accuracy may highlight system deficiencies.

The methods used to measure, record and report performance should be left to the business to develop in its reporting protocols and agree with the Tribunal

Hunter Water has suggested that where a different driver is applied, then it could report on additional indicators to permit comparisons. We welcome this suggestion and accept that it may be appropriate in some circumstances.

4.11 Denominators

One of the benefits of applying broad comparability with Sydney Water in standards and indicators is that the Tribunal and others will be able to make valid performance comparisons between the businesses and use these as a surrogate for competition. As a progressive organisation, we anticipate that Hunter Water will welcome such comparisons as they can contribute to delivering continual improvement in efficiency.

Many of the measures we recommend are cast in absolute numbers for the reasons set out previously. In order to compare Hunter Water's performance with other water and sewerage businesses, it would be necessary to calculate ratios or percentages using denominators. The robustness of the denominators should be equal to or better than the robustness of the numerator; therefore we suggest provision of such data should be a licence requirement and therefore auditable.

The annual information return submitted to the Tribunal by Hunter Water contains much of the data required but as there are no definitions and it is not subject to audit, the robustness of the data is uncertain.

4.12 Definitions

Definitions for the proposed core standards, service commitments and indicators are given in Appendices B, C and D. Separate definitions for the system performance standards in Option B have not been given as these would be little different to the definitions already presented for option A. We have indicated in footnotes the changes that would be needed for use with option B.

5 Supply and demand balance

5.1 Introduction

The balance between available supply of water after system losses and demand determines the security of water supply against drought. In this section, we consider how these dimensions might be regulated including the issues of leakage, demand management and reuse.

5.2 Existing system performance standard

5.2.1 Definition and measurement

Paragraph 5.3 of Hunter Water's licence requires it 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" [5]. Drought is defined as when reservoir contents are 60% or less of available storage at which point Hunter Water may seek to apply demand restrictions. If it did not, then it would not count as a drought for the purposes of the licence standard and the definition of a drought is therefore in practice irrelevant in this context.

The existing standard is inadequate on its own as it regulates the number of occasions when drought security measures are imposed, not the duration that those measures have to be kept in force.

Compliance with this standard is assessed by computer simulation techniques. The methodology has been developed and improved in recent years but is not defined in Hunter Water's Service Performance Evaluation Manual (SPEM).

We conclude that the present standard is not adequately defined or measured, principally because:

- It does not regulate the duration of drought restrictions and
- The methodology and assumptions are not defined in Hunter's SPEM.

[5] Licence under Section12 of the Hunter Water Board (Corporatisation) Act 1991.

5.2.2 Historical performance

Despite the fact that level 1 restrictions (limited use of sprinklers) have been imposed twice times in the past 10 years, successive licence auditors have assessed Hunter Water to be in compliance with its obligation. This apparent anomaly is a consequence of the statistical nature of the requirement and the uncertainties surrounding its calculation.

In its submission to the Tribunal, Hunter identifies three uncertainties:

- Climate
- Changes in community response to restrictions and
- Modelling uncertainty.

While climate is outside Hunter Water's control, community response and modelling uncertainty are, at least in part, within its control. Modelling uncertainty is largely a function of the assumptions including:

- Demand forecasts; Hunter could influence the predicted security by adopting more or less conservative forecasts
- The quality of water in the Williams River; by accepting water of lower quality it might defer or avoid the need for demand restrictions
- The yield of the Tomago sandbeds; research in progress should result in more reliable estimation of the yield when the source is stressed.

Calculation of security of supply is, as is the case with most water utilities, highly dependent on assumptions.

5.2.3 Influence on capital planning

The existing requirement is a significant influence on capital planning. For example at the 1999 price review it led to Hunter Water proposing a major extension to the Grahamstown Dam. Subject to our reservations regarding the inadequacy of definition and measurement and uncertainties surrounding the assumptions, it has played a role in ensuring that Hunter Water has resource systems in place to deliver water service to customers

5.3 Existing standards at Sydney Water

The Sydney Catchment Authority licence includes a security of supply obligation that is repeated in its agreement with Sydney Water:

- Reliability not less than 97%, interpreted to mean that, on average, restrictions will not need to be applied more often than 30 months in 1,000 months
- Robustness not less than 90% interpreted to mean that that, on average, not more than 10 years in 100 years will be affected by restrictions
- Security is to be not less than 5%, interpreted to mean that on average, storage will not fall below 5% more often than one month in 100,000 months.

We support Sydney Catchment Authority's view [6] that its current modelling methods, similar to those used by Hunter Water, do not provide the customer with tangible answers as to whether the water is being effectively managed. Sydney Water is currently working with Sydney Catchment Authority and developing performance measures for water reliability for further consideration. We suggest it would be beneficial if Hunter Water were to join this process.

Sydney Water also has a demand management obligation in its licence requiring it to reduce the quantity of water (other than re-use water) it draws from all sources to the following target levels:

- 364 litres per capita per day by 2004/5
- 329 litres per capita per day by 2010/2011

Actual water use in 1998/99 was 415 litres/capita/day [7].

Examples of other mechanisms for regulating the supply and demand balance adopted elsewhere are given in Appendix E, section 14.1.

5.4 Customer needs and expectations

Hunter Water has not provided us with any data on the needs and expectations of its customers with respect to drought security.

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[6] Submission on the review of Hunter Water's Operating Licence; Sydney Catchment Authority; 25 September 2001

[7] Demand Management Strategy; Sydney Water; December 1999

Sydney Water recently carried out research [8] that included questions relevant to customer attitudes to demand management in a drought situation. This indicated that customers are willing to reduce consumption during a drought and that imposing drought restrictions would have a positive impact on their perception of the business.

While we have been told that other work is currently being undertaken in Australia, the only data we have seen is related to domestic use rather than customer needs and expectations.

5.5 Local factors

Supply side factors that influence regulation of the supply demand balance include:

- The nature of the existing resources
- The weather and water environment from which abstractions are made
- Physical constraints on the use of water.

There are also demand side factors to consider including:

- The robustness with which Hunter Water can account for all water put into supply through a water balance
- Knowledge of real system losses from mains, connections and service reservoirs and the economic level of leakage
- Progress on residential and non residential demand management
- Success in promoting wastewater reuse.

Detailed background on these local issues is given in appendix F.

5.6 Options for regulating supply and demand

Available resources and forecast demand determine the security of supply in drought. The options we have considered for regulation of the supply and demand balance are:

[8] Water Use: practices and intentions; Customer research; Sydney Water; September 2000

- *Demand management regulation* - mandatory targets for leakage, customer demand and reuse with security of supply targets a secondary driver

- *Security of supply regulation* – a primary mandatory target for drought security and demand management targets as a secondary driver

- *Economic instrument* - driving the business through rebates to customers in the event of restriction s due to drought

- *Security of supply plan and water conservation strategy* - looking at the individual influences and establishing a planned response for each

- *Least cost management* - where supply, demand management and security of supply are given equal weight and an optimum solution is sought.

The advantages and disadvantages of these options for regulating supply and demand are reviewed in Appendix F.

5.7 Preferred strategy

When carrying out our review of Sydney Water, we were constrained by the fact that it was a review of system performance standards and a demand management target was already established elsewhere in the licence. Security of supply was therefore considered as the other variable that should be regulated via standards leaving resource augmentation as an unregulated variable.

We do not regard the approach at Sydney Water to be ideal. It places excessive weight on demand management where there is a stringent target for which we have been unable to find the economic rationale.

The preferred solution is one where supply, demand and security of supply are considered as equal and interdependent components taking account of social and environmental objectives.

Least cost water balance management in which an optimum overall least economic cost solution is sought leading to targets for each component provides a robust way to achieve this. Least cost water balance management would involve integrated resource planning incorporating least cost planning to evaluate the costs

and benefits of a range of means of meeting water customers' demand for water related services within an economic decision making framework [9].

Implementation of this strategy should be based on a licence obligation requiring Hunter Water to prepare and submit to the Tribunal a least economic cost plan for supply and demand management incorporating, inter alia, the following elements:

- Constraints including those imposed by the Water Management Licence
- Operational strategy to maximise yield of existing resources in normal conditions
- Implemented operating strategy with any departures from the maximum yield strategy to reduce cost justified on a cost benefit basis
- Drought management strategy
- Water conservation and reuse strategy
- Water balance analysis (actual and climate corrected)
- Demand forecasts
- Levelised unit costs of water [10] and reliable yields of all supply and demand side options, including all demand reduction options.

Having considered all these influences, the least cost alternatives for demand management and/or supply augmentation to deliver various levels of drought security would be derived together with projections for key indicators. Having considered customer views, and Hunter Water's proposals, the Tribunal would make a decision on the way forward at the time of a price path determination, allowing relevant expenditure and setting targets for the price path period for:

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[9] National Working Group on Water Conservation; Discussion paper – regulating for economic water efficiency; Stuart White; Institute for Sustainable Futures; May 1998

[10] the unit cost of water levelised over a period taking into account all capital and operating expenditure by company or the customer and amount of water saved or delivered; National Working Group on Water Conservation; Discussion paper – regulating for economic water efficiency; Stuart White; Institute for Sustainable Futures; May 1998

- Leakage, demand management and reuse
- Security of supply.

The plan period should be at least 10 years with economic calculations based on at least a 20 year time horizon. It should be rolled forward in parallel with each price determination and between reviews when required by the Tribunal, probably annually until confidence that the assumptions are robust is gained.

Preparation of the plan will be a learning process for both Hunter Water and the Tribunal and therefore close co-operation between the parties during this period is important. There should also be a requirement for public participation in preparation of the plan and evaluation of alternative strategies. The Tribunal must audit and accept the plan and it would be helpful for the auditor to have an ongoing brief during its preparation and subsequent revisions. The first plan should be prepared and agreed so that it is available for the 2003 price review.

In determining the levelised unit cost, it would be possible to include externalities including environmental costs. We have not been able to identify any robust assessment of such costs appropriate to the Hunter Water region. Subject to customer acceptability, consideration could be given to the inclusion of robust social and environmental costs at a later iteration of the strategy. In this way, the socio-economic circumstances of the Hunter region and the priorities of its inhabitants can be reflected in the decision making process.

We note that Hunter Water is required to publish a demand management strategy each year as a condition of its water management licence. That demand strategy would in effect be one part of this least cost plan. In auditing the plan, it would be appropriate for the DLWC views and interests to be incorporated in some way.

There may be a need for the Tribunal to review the methodology for calculating developer contributions to ensure it is consistent with this approach and gives the desired price signals to potential customers.

5.8 Option A – core standards and service commitments

5.8.1 Core standards

We do not propose a core standard for regulating the supply demand balance. There are substantial uncertainties in this area and our recommended approach envisages the need for an iterative process in which the optimum targets are developed and refined as better data becomes available.

5.8.2 Service commitments

The preferred method for implementing our proposals is through service commitments. Options for demand management and security of supply that emerge from the planning process should be used to establish targets as part of the price path determination process.

It would be possible to establish targets for each of the components of the water balance, for example residential demand or leakage. We consider it better to set a single target for water saved. With a global target, it is practical for Hunter Water to seek the most cost effective combination of demand management measures as knowledge increases and circumstances evolve. Maintaining a security of supply service commitment ensures that customer service is given equal consideration in the decision making process.

The proposed service commitments for which targets should be established through the supply and demand strategy process are:

(a) Demand management

- Hunter Water must ensure that over a price path period, the sum of metered consumption saved calculated by customer sector and leakage saved is not less than [to be determined]Ml

- Reporting protocols should be designed to achieve accuracy better than ±10% with 95% confidence limits.

The definition we recommend for demand management incorporates climate correction and adjustments for growth in the customer base. Savings in residential and non residential water use, reuse where it is in substitution for potable water and leakage all count towards the single target. Special provisions apply where large customers are concerned. Full details are included in appendix C, section 12.1.1.

(b) Security of supply

- Hunter Water must maintain and provide works sufficient to meet

  (i) A probable occurrence of drought in a report year (requiring the imposition of water restrictions) at no less than 10 yearly intervals

  (ii) A probable duration of drought in a report year (requiring the imposition of water restrictions) of no more than 1 month in 20 (5%).

No accuracy requirement is suggested due to the difficulty of making any meaningful assessment; the reporting protocol should be assessed against best practice.

We do not recommended that drought is defined as in the current licence. The current definition of a drought based on reservoir contents is poor and more akin to an operating rule. Even if storage were less than 60%, it would not be considered as a drought if no restrictions needed to be applied because it was at a time when rainfall was expected.. In our view, such matters should be in operating rules in the drought management plan and referred to in the reporting protocol.

The suggested compliance targets lock in the current level of security of supply until more appropriate alternatives emerge as part of the proposed process; they should then be revised as part of the price path determination process.

Consideration should be given to any alternative measure of drought security arising from the work by Sydney Water and Sydney Catchment Authority being applied to Hunter Water in lieu of the drought security service commitments above.

No compliance target is suggested for the water saved service commitment. The target should be an output from the least cost plan developed by Hunter Water and approved by the Tribunal.

5.9 Option B – system performance standards

For the reasons set out previously, we consider that the use of mandatory system performance standards for regulating the supply and demand balance is not advisable. However if our Option A were not adopted, then in the interests of customer protection, the supply demand balance would still have to be regulated through system performance standards for security of supply and demand management.

The proposed system performance standards are:

- Hunter Water must ensure that the sum of metered consumption saved calculated by customer sector and leakage saved is not less than zero Ml p.a.

- Hunter Water must maintain and provide works sufficient to meet a probable occurrence of drought in a report year (requiring the imposition of water restrictions) at no less than 10 yearly intervals

- Hunter Water must maintain and provide works sufficient to meet a probable duration of drought in a report year (requiring the imposition of water restrictions) of no more than 1 month in 20 (5%).

We believe it likely that a cost neutral target for water saved could be more stringent than that suggested because, for example leakage may currently be greater than the economic level of leakage. Data is not available on which to base the necessary judgements. Until the least cost plan is approved and any necessary funding made available through prices, the target for metered consumption saved plus leakage saved should be neutral, that is leakage plus demand should not rise after allowing for increases or decreases in the customer base.

5.10 Indicators

5.10.1 Key indicators

We recommend that two indicators should be used to demonstrate the robustness of the water balance and assist in understanding the importance for the demand management strategy.

- Water balance data (see section 15.2.1) showing the components of demand:
- Bottom up assessment of water losses.

A third indicator is recommended to enable Hunter Water to demonstrate where water savings have been achieved:

- Metered demand by customer type.

Additional indicators would be needed in the event of drought requiring water restrictions. Although some measures might be seen as appropriate now, the circumstances would also dictate the relevant data to collect. For example, in a severe drought it might become necessary to resort to rota cuts. Therefore we suggest that the necessary powers should be available to require a special report from Hunter Water if none are currently available

5.10.2 Additional indicators

Additional indicators might also be included in the Environmental Management Plan as follows:

- Volume of water reused in irrigation (direct)

- Volume of water reused in irrigation (indirect).

The environment plan might be the appropriate place to include a range of additional indictors to show the methods and effort applied by Hunter Water to manage demand including, for example:

- Number of water audits
- Number of water saving devices installed by Hunter Water in residential and non residential customers' premises (shower heads, grey water tanks etc.)
- Number of water saving devices provided as part of demand management strategy, including, for example, subsidised goods sold at commercial outlets.

5.11 Costs and benefits

Total supply and demand management may not be cost neutral in its effect. Therefore while the process should be introduced in principle, there should be no requirement for targets significantly in excess of current performance until the next price determination. At that time it may be appropriate for the Tribunal to allow additional resource costs, including demand management costs.

The benefits of introducing the service commitments and indicators as outlined above through a process of least cost planning are that the overall costs to the community can be optimised after consideration of alternative balances of supply, demand and drought security.

6 Water service

6.1 Introduction

In this section, we consider the capability of Hunter Water's water distribution system to deliver appropriate levels of service to customers and how this might be reflected in service commitments and indicators.

6.2 Continuity of water supply

6.2.1 Interruptions

Water reticulation systems generally provide very high levels of continuity of service to customers but as assets age, they need to be taken out of service for maintenance or repair from time to time.

Interruptions may be either due to planned works for which notice can be given or emergencies for which notice may be impractical. The duration is a function of the complexity of the work to be done related partly to the size of the asset.

6.2.2 Existing system performance standards

Hunter Water's licence includes an operational standard for water discontinuity requiring that

- 92% of properties will not incur discontinuity of water services for more than 5 hours duration annually.

Although we see some ambiguity in the wording of this standard, Hunter Water has always interpreted it to mean the cumulative duration of interruptions in a report year. This and other details of interpretation, measurement and reporting are included in the System Performance Evaluation Manual [11]. While Hunter Water is not required to submit this manual for external scrutiny or approval and can amend it as it wishes, Schedule 4 of the licence requires measurement of performance to conform to the requirements set out in it.

In reporting against the standard, both planned and unplanned discontinuity events are included regardless of duration.

[11] Service Performance Evaluation Manual; Hunter Water; 2000

From the customer's standpoint, there are two dimensions to discontinuity. Firstly the duration of any interruption and secondly the return frequency. The current standard has an advantage of simplicity in that it combines both dimensions. However it does not facilitate understanding of the underlying causes of trends or planning appropriate asset management strategies.

6.2.3 Historical performance

Hunter Water has historically achieved performance in excess of its current system performance standard target of 92% as shown below.

% properties with < 5 hours (cumulative) interruptions p.a.[12]

92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00	00/01
94.60	95.80	97.50	94.80	92.70	93.70	96.00	94.34	96.23

Hunter Water has also provided some additional data on interruptions greater than 5 hours, a time commonly adopted in Australian water standards, and repeat interruptions as follows:

	Properties with individual unplanned interruption >5 hours					
	95/96	96/97	97/98	98/99	99/00	00/01
Number of properties	2745	5478	4343	903	1495	1882

	Number of properties affected by interruption of any duration					
	95/96	96/97	97/98	98/99	99/00	00/01
Total	62505	62465	74396	45393	77537	72245
previous interruption <6 months before	22337	22906	31229	16911	28047	26240

The relevant audit reports indicate that while the performance dips in 1996/97 and 1997/98 were influenced by bursts on critical mains, avoidable or controllable operational problems also affected the outcome.

[12] Source for years 1992/93 to 1995/96, Hunter Water; for subsequent years, the relevant audit report

Excluding those properties where bursts of greater than 5 hours duration occurred there are some signs of a downward trend in the data but considerable annual variation.

Hunter Water told us that this measure is not, and was never meant to be, a driver of asset management strategy but was intended to ensure that its performance did not deteriorate. If it can ensure that performance does not deteriorate without considering this standard as a driver of its asset management strategy, then the corollary is that the target is readily met.

6.2.4 Influence on service delivery

Hunter Water has told us that the existing standard has no impact on asset management. We believe maintenance and investment are driven by sub sets of this data with internal targets.

Planned discontinuity events are necessary for system maintenance and have to be separated out. Where there are frequent short interruptions, different asset management strategies may be needed to where there are fewer but longer discontinuities. Therefore each area has to be assessed on the basis of a more detailed assessment of the underlying service delivered to customers, as well as asset condition data, than is possible with the present single standard.

As a composite measure, it could lead to a decision to cut maintenance activity if the number of unplanned interruptions, that cannot be controlled in the short term, was leading to risk of failure to meet the standard. On its own, it is a poor standard that could lead to inappropriate responses.

6.2.5 Existing standards at Sydney Water

A revised system performance standard dealing separately with planned and unplanned interruptions has recently been applied to Sydney Water as follows:

- Sydney Water must ensure that in any report year, the number of properties connected to its water supply system that are reported as affected by an unplanned interruption of water supply exceeding 5 hours does not exceed 35000

- Sydney Water must ensure that in any report year, the number of properties connected to its water supply system that are reported as affected by a "planned and warned" interruption of water supply exceeding 5 hours does not exceed 32000

Data for the following additional indicators is also being collected:

- Number of properties affected by interruptions in a report year by time band
- Number of events in a report year by type of interruption.

Examples of standards in use elsewhere are included in Appendix E, section 14.2.1.

6.2.6 Customer needs and expectations

Hunter Water last researched satisfaction with water services in 1998 [13]. 91.1% of customers were reported as saying that frequent interruptions in the water supply did not occur. Although the figure does not differentiate between possible causes, the implication is that 8.9% of customers are experiencing what, in their view, were "frequent" interruptions.

Our own experience, substantiated by customer research carried out by Sydney Water, is that the issues most relevant to customers are:

- *Notification received* - All non emergency interruptions should be pre notified so customers can make alternative arrangements.
- *Time to restore supply* - Customers' ability to store water is limited and inconvenience increases exponentially with duration.
- *Frequency of interruptions* - Customer tolerance will be strained if the frequency of interruptions is considered excessive.

The existing interruption standard is relevant to customer needs and expectations. However as an omnibus indicator, it does not facilitate separate consideration and understanding of, or response to, the different dimensions of the problem.

Those who use water for process purposes have particular needs regarding continuity of supply. Incitec, a large user of water in Newcastle, highlights this issue in its submission to the Tribunal. The financial impact of interruptions on large users can be great but because these are rare events and storage is costly, provision is usually minimal.

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[13] Hunter Water Corporation 1998 Customer Survey; Hunter Valley Research Foundation; October 1998

Incitec suggests that the number of properties in the system performance standard should be weighted by the consumption of the users affected. We do not consider this suggestion practical or equitable; it would lead to the utility having to ensure zero risk of interruptions at large users to avoid a breach of its licence. The particular requirements of large customers are best dealt with in individual negotiated agreements reflecting the individual circumstances. The customer contract, possibly a business customer contract, might set out the basis for realistic negotiation of individual terms and conditions of supply.

6.2.7 Regional factors

Hunter Water suggested that the local factors influencing the appropriate reporting threshold and compliance target for water discontinuity included:

- A radial distribution system from its three principal sources with lower connection density to other NSW water businesses; it suggests that there are significant communities reliant on a single main
- Growth on the radial elements which it is not cost effective to reinforce
- Reactive clay soils and high proportion of cast iron mains leading to high inherent burst rate and climate related variation
- Three identified critical situations where there is low probability of a major discontinuity event.

These factors are related to the risk of interruptions and influence the natural year on year variability in the interruption rate.

6.2.8 Key issues

The key issues for regulation of water service interruptions are:

(a) Appropriateness of current system performance standard

The current system performance standard is a composite measure of the overall impact on customers of all interruptions, regardless of duration or cause. Because it combines both planned and unplanned events, it is not appropriate in isolation as the single driver of capital expenditure or as an indicator of progress.

(b) Differences between planned and unplanned interruptions

Unplanned interruptions are the most important driver of service continuity investment. Arguably, it is inappropriate to regulate planned interruptions as well as the business should not be constrained from carrying out maintenance. While it is of lesser importance to investment and to customers, it is sometimes regulated, as at Sydney Water, because it is a significant aspect of customer service.

(c) Repeat events

Excessive repeat events are a reflection of asset deterioration as well as being a determinant of customer dissatisfaction. A strict financial analysis of the costs of repair usually leads to the conclusion that rehabilitation or replacement can be delayed beyond the point that is acceptable to customers. Thus serviceability drives the investment rather than condition. By including social costs in its analysis, Hunter Water has sought to reflect the impact on customers of excessive interruptions; we accept the validity of this approach provided that the social costs are substantiated. Repeat events should be regulated as a driver of costs and customer dissatisfaction.

Where regular repeat "planned and warned" events are occurring, the value of the advance notice in avoiding adverse customer reaction will diminish. Regulation of repeat events should include both planned and unplanned events.

6.2.9 Option A – core standard and service commitments

Our preferred option A is a package consisting of a core standard, two service commitments and supplementary indicators. We must emphasise that the core standard suggested would have serious deficiencies if implemented without the rest of the package.

The core standard is a measure of overall customer impact including both planned and unplanned interruptions of any duration. The recommended service commitments repeat proposals we made and were endorsed by the Tribunal as system performance standards for Sydney Water. Sydney Water proposed a system performance for planned interruptions that was also included for this reason. We do not believe such a standard is essential and have therefore not carried it forward for Hunter Water, particularly as unplanned interruptions are reflected in the core standard recommended. An indicator is proposed to gather comparative data.

The suggested compliance targets are based on the most adverse drought conditions in the past decade. More extreme drought conditions could compromise Hunter Water's ability to meet the suggested compliance target in subsequent wet years and should be taken into account in making regulatory judgements.

(a) Core standard

We propose that the current system performance standard should be maintained with a tighter compliance target and reported in terms of absolute number of properties failing rather than percentage compliance:

- Hunter Water must ensure that the number of properties incurring discontinuity of water services for more than 5 hours cumulative duration annually shall not exceed 13500 properties

- Reporting protocols should be designed to achieve accuracy better than ±5% with 95% confidence limits.

The current target of 92% is equivalent to around 15500 properties above the reporting threshold.

In recommending a compliance target of 13000 properties, we have analysed data and other evidence provided by Hunter Water for the past 6 years in conjunction with the audit reports and considered the impact of major events causing interruptions greater than 5 hour duration separately.

Interruptions due to major events are summarised below. From consideration of the relevant audit reports, we believe that some of the incidents in 1996/97 and 1997/98 were avoidable and have excluded them.

	Number of properties with interruption event >5hours					
	95/96	96/97	97/98	98/99	99/00	00/01
Number of properties	2745	5478	4343	903	1495	1882
Properties affected by avoidable incidents		2022	1660			
Net properties	2745	3456	2683	903	1495	1882

Hunter Water has told us that there are around 100000 properties on critical radial arms of its distribution system that are at risk. We acknowledge the inherent risk of this situation and have therefore allowed 5000 properties in the target, some

40% greater than the maximum from incidents causing interruptions greater than 5 hours in the past 6 years, excluding avoidable incidents.

From AIR and Hunter Water data and the audit reports we have derived the following estimate of properties affected by multiple events leading to total interruptions greater than 5 hours. We have assumed that properties affected by the avoidable incidents referred to above would not otherwise have been reportable. There is no explanation for the peak year of 1999/00 in the audit report.

	Number of properties with interruptions					
	95/96	96/97	97/98	98/99	99/00	00/01
> 5 hour cumulative	9986	13662	11966	7713	11054	7363
> 5 hour single event	2745	3456	2683	903	1495	1882
> 5 hours cumulative (multiple events)	7241	8184	7623	6810	9559	5481

If this core standard were taken into account in its asset management strategy, Hunter Water would have the incentive to manage the duration of interruptions better. We suggest that Hunter Water should be able to achieve performance of not more than 8000 properties p.a. with cumulative interruptions greater than 5 hours at little or no cost. However we suggest a figure of 8500 properties to allow some headroom for growth and other compounding factors.

We therefore recommend a target of 13500 properties for this core standard

(b) Service commitments

We consider that that there should be two service commitments for which targets need to be established. Firstly, to ensure water supply is restored as soon as reasonably practicable after unplanned interruptions:

- Hunter Water must ensure that in any report year, the number of properties connected to its water supply system that are affected by an unplanned shut off of water supply exceeding 5 hours does not exceed [4000] properties

- Reporting protocols should be designed to achieve accuracy better than ±5% with 95% confidence limits.

The draft compliance target of 4000 properties is recommended for the reasons set out above but with less headroom because this is a service commitment.

Secondly, to ensure that the number of customers inconvenienced by excessively frequent interruptions is managed:

- Hunter Water must ensure that in any report year, the number of properties where the time since the last planned or unplanned interruption was ≤ 26 weeks does not exceed [33000] properties

- Reporting protocols should be designed to achieve accuracy better than ±5% with 95% confidence limits.

Over the past six years, the number of properties with interruptions in the previous 26 weeks has averaged 24600 with a peak in 1997/98 of 31229. The numbers are variable and cannot be readily controlled in the short term, it would take some months to mobilise and reverse an increasing trend. The target should therefore be set with headroom above the highest figure until the implications of working to a tighter target have been explored and the cost consequences understood. The draft target of 33000 properties gives 5% headroom above the peak.

We consider that these two indicators provide a reasonable reflection of the key aspects of discontinuity to customers and a basis for robust monitoring of performance with time.

6.2.10 Option B – system performance standards

If our preferred option A were not adopted, then we would recommend two system performance standards in similar terms to the service commitments recommended under option A. We do not believe that a standard for planned interruptions to be essential but this could be added for comparability with Sydney Water. We have suggested an indicator be included.

The suggested compliance targets are based on the most adverse weather conditions in the past decade. More extreme weather conditions could compromise Hunter Water's ability to meet the suggested compliance target and should be taken into account in making regulatory judgements.

Firstly, to ensure water supply is restored as soon as reasonably practicable after unplanned interruptions:

- Hunter Water must ensure that in any report year, the number of properties connected to its water supply system that are affected by an unplanned shut off of water supply exceeding 5 hours does not exceed 5000 properties

- Reporting protocols should be designed to achieve accuracy better than ±5% with 95% confidence limits.

The compliance target of 5000 properties is suggested for the reasons set out section 6.2.9(a) above.

Secondly, to ensure that the number of customers inconvenienced by excessively frequent interruptions is managed:

- Hunter Water must ensure that in any report year, the number of properties where the time since the last planned or unplanned interruption was ≤ 26 weeks shall not exceed 35000 properties

- Reporting protocols should be designed to achieve accuracy better than ±5% with 95% confidence limits.

The compliance target of 35000 properties is suggested for the reasons set out section 6.2.9(b) above but includes 10% headroom rounded up as this would be a licence standard.

6.2.11 Indicators

Additional indicators are suggested to complement the performance data relating to the standards and service commitments. Firstly two indicators are suggested to give improved understanding of the duration and causes of interruptions and any trends:

- Properties affected by interruptions by type of interruption (planned, unplanned etc.)

- Properties affected by unplanned water interruptions by time band

- Properties affected by planned water interruptions by time band

Interruptions affecting single properties are excluded from the core standard and service commitments. The following indicator will identify such problems:

- Planned and unplanned interruptions affecting a single property

Finally to understand the causes of multiple interruptions and understand trends:

- Properties with repeat interruptions broken down by type of interruption.

6.2.12 Costs and benefits

The benefit of the proposed service commitments and indicators are that they will focus Hunter Water on the issues of principal concern to customers, avoiding overlong unplanned interruptions and excessive repeat interruptions. Hunter Water currently uses similar parameters for asset management purposes. Establishing service commitments will add transparency to regulatory process by setting the framework for consideration of possible cost-benefit trade proposals in price setting proposals and demonstration that assets are being properly maintained and agreed improvements delivered.

The suggested compliance targets are based on current performance and our view of the scope for Hunter Water to improve current practice without significant cost consequence. Focussing attention on these specific aspects of interruptions in lieu of the current omnibus standard may lead Hunter Water to consider the cost benefit trade off of working to more stringent targets. Decision on raising the compliance targets to deliver higher standards should be taken at a price review.

6.2.13 Customer contract

The present customer charter includes provision for rebate of the entire water service charge where total confirmed interruptions to water service in a year exceed 24 hours.

Hunter Water has suggested that compensation should be included in a revised customer contract and that in addition to the current provision, any customer experiencing more than five interruptions longer than ½ hour each in a year should be entitled to a rebate of charges for the year. Hunter Water believes that it is better to pay a substantial sum in compensation where poor service has been provided to a customer rather than smaller amounts for each failure.

The move to an additional trigger for compensation based on frequency of interruptions is an improvement on the current scheme. Without making any judgement on the approach, we would consider the payment thresholds are weighted against the customer; six interruptions of greater than 30 minutes in a year is off the bottom of the scale as regards customer service.

6.3 Adequacy of water supply

6.3.1 Pressure and flow

Customers expect an adequate flow and pressure for the use they are making of water at the time. Key determinants may vary from the time it takes to fill a kettle or bath, the feel of a shower or reach of the jet from a garden hose.

For many uses, for example filling a kettle, flow is more important to the customer than pressure. However except where there are constraints in the service pipe, pressure in the main is a good surrogate for flow and more readily measured. It is therefore frequently adopted as the basis of a driver reflecting the adequacy of water service.

6.3.2 Existing system performance standards

Hunter Water's licence includes an operational standard for water pressure requiring that "95% of water customers per annum will not experience a verified low pressure incident of less than 20 metres as measured at the service meter".

This and other details of the interpretation, measurement and reporting are included in the System Performance Evaluation Manual (SPEM). While Hunter Water is not required to submit this manual for external scrutiny or approval and can amend it as it wishes, Schedule 4 of the licence requires measurement of performance to conform to the requirements set out in it.

6.3.3 Historical performance

Hunter Water has, except in 2000/01, achieved performance well in excess of its current system performance standard target of 95% as shown below.

% properties with continuous pressure > 20 metres [14]

92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00	00/01
99.00	99.00	99.00	99.00	99.00	98.45	98.74	98.58	97.50

In January 2001, Hunter Water experienced peak demands in excess of the previous highest peaks and its planning assumptions leading to low pressure in a number of areas. Remedial has been taken or is planned to address each of the

[14] Source for years 1992/93 to 1995/96, Hunter Water; for subsequent years, the relevant audit report

identified low pressure hot spots. Hunter Water has acknowledged that headroom within the current compliance target is excessive.

6.3.4 Influence on service delivery

Hunter Water's internal design standard for water systems includes a requirement for a minimum mains pressure of 20 metres. It is therefore logical and appropriate that this was chosen as the reporting threshold when the licence requirement was first imposed.

When supplying isolated communities in elevated locations, Hunter Water, at one time, used a lower design standard of 16 metres where is was not cost effective to provide the normal standard. This has resulted in some 1400 properties, serviced from adjacent elevated tanks; the consequence is that Hunter routinely reports that the pressure standard is not achieved at these properties amounting to 0.7% of the total connected properties. On a normal day the pressure will reflect the level in the tank and may drop to 16 metres with the tank at minimum water level. However these properties, due to the proximity of the tank, are unlikely to drop below 16 metres, except in extreme circumstances. As widely varying pressure is usually more a problem than the actual pressure itself, we believe that there is no valid reason for setting a reporting threshold or compliance target that would drive investment to rectify this situation.

6.3.5 Existing standards at Sydney Water

A revised system performance standard has recently been applied to Sydney Water as follows:

"The number of properties connected to Sydney Water's system that do not receive continuous water pressure at the main tap of at least 15 metres should not exceed 15,000 properties in a report year. The number of properties is to include designated low pressure areas."

Data for the following additional indicators is also being collected:

- Number of properties that do not receive continuous water pressure at the main tap of at least 15 metres as a result of abnormal operations

- Number of properties where pressure of less than 15 metres head at the main tap occurs more than once during the report year.

Examples of standards in use elsewhere are included in Appendix E, section 14.2.2.

6.3.6 *Customer needs and expectations*

Hunter Water last researched satisfaction with water services in 1998 [15]. The survey showed that 86.6% of customers considered their water pressure was acceptable. Given the high performance against a reporting threshold that is at the top end of the range of reporting thresholds, a significant number of dissatisfied customers may, at first sight, seem surprising. The reason may be that customers have adapted to the high pressure and it is pressure fluctuations that they are reporting as unsatisfactory.

The existing standard is relevant to customer needs and expectations for water at an adequate pressure.

6.3.7 *Regional factors*

Hunter Water told us that it is experiencing a change in customer demand patterns. While the overall consumption is not changing, the morning peak is reducing and the evening peak increasing. It suggested that this was due to changes in lifestyle.

The SPEM shows that Hunter Water takes a reactive approach to identifying low pressure problems. Some low pressure problems may be missed by this approach. In practice, it has some 50 water pressure monitoring stations at sewage pumping stations and more at booster pumping stations all linked to its telemetry system. In addition it has mobile pressure loggers that it uses to survey its system as well as following up on pressure complaints. We suggest that there would be advantages in a proactive approach to monitoring pressure monitoring in marginal areas as well as following up on complaints.

6.3.8 *Key issues*

The key issues for customers are:

[15] Hunter Water Corporation 1998 Customer Survey; Hunter Valley Research Foundation; October 1998

(a) Appropriateness of current standards

The current standard has, for most customers, been available for a long time and familiarity and acceptability are arguments for retaining the 20 metre reporting threshold. Introducing a lower reporting threshold would not mean that Hunter Water would have to reduce pressure to any customer or even start designing to a lower pressure although there could be economic advantage in doing so, merely that its performance would be judged against a lower reporting threshold. Hunter Water has suggested that its current design standard is important for fighting bush fires, even though it is not common elsewhere in NSW. If this factor is important, then Hunter Water could include the relevant social costs in determining the economics of working to a lower pressure.

Sydney Water has a lower reporting threshold of 15 metres and in country areas of NSW, it is 12 metres; this is the threshold at which payments under Hunter Water's customer charter are currently payable. Some submissions to the Tribunal have argued that a lower reporting threshold should be applied at Hunter on grounds of demand management.

Hunter Water told us that it had adopted the current 12 metre pressure threshold for customer charter payments as at that level, customers were not inconvenienced, for example, by appliances not working. The corollary is that a reduction from 20 to 15 metres minimum pressure should not lead to insuperable customer problems provided that it were implemented sensitively.

Theoretically, pressure control can lead to reductions in leakage and, to a lesser extent, beneficial water use because the flow from an orifice increases exponentially with pressure. In practice, the benefits are often greater as the size of the opening is sometimes a function of pressure.

Pressure control is normally applied by subdividing the system and controlling pressure at the inlet to each zone mechanically; it could be introduced without a change in the current reporting threshold and worthwhile benefits might be anticipated. While the additional returns from being able to work to a lower minimum pressure would be less, it would provide additional flexibility and signal the importance of demand management.

(b) Appropriateness of the current compliance target

With the exception of 2000/2001, Hunter Water has consistently reported around 99% of customers receiving above 20 metres pressure, the exceptions largely the 1400 customers in areas with a 16 metre design pressure. If the reporting

threshold were reduced to 15 metres, these properties would still be at risk of being reportable in extreme demand conditions.

Last year, extremely high summer peak demand led to unforeseen pressure problems. Action has been taken or is planned to reinforce the system and eliminate these localised problems.

Hunter Water argued in its submission that compliance should be measured on a three year rolling average basis to allow for the possible impact of extreme events. We do not favour this option for the reasons set out in section 4.5. Our preferred option in this case is to include sufficient headroom in the compliance target such that the driver is to maintain current performance.

(c) Exclusions

At Sydney Water, the standard applies to the system operating normally at up to peak hour demand. The definition excludes low pressure due to operational problems that are not remedied within 4 days of the first occurrence in a report year. The standard at Hunter Water applies universally. A higher compliance target could be applied if the exclusions were adopted.

In formulating our recommendations, we have sought to construct a framework for regulation of performance that is an appropriate reflection of service to customers. If there are no exclusions for abnormal circumstances such as main breaks and circumstances of abnormal demand, for example, fire fighting, then we would see an incentive for Hunter Water to invest in additional system redundancy to maintain pressure during such events. The most appropriate driver is pressure in the system when it is operating normally up to peak flow rates

6.3.9 Option A – core standard and service commitments

We conclude that retention of the current 20 metre reporting threshold is not justified and recommend a core standard with a 15 metre reporting threshold.

(a) Core standard

We recommend the following core standard:

- Hunter Water must ensure that the number of properties connected to the water system that do not receive continuous water pressure at the main tap above 15 metres with the system operating normally does not exceed 2000 properties

- Reporting protocols should be designed to achieve accuracy better than ±10% with 95% confidence limits.

Hunter Water carried out some hydraulic modelling that suggested 1420 properties experiencing pressure below 15 metres for more than 15 minutes in circumstances of extreme day demand. The concept of extreme day demand has not been rigorously explained to us but includes certain emergencies that would be excludable under the proposed definition of the system operating normally. Also the calculation appears to have been based on a 30 minute peak rather than the less onerous 60 minute peak in our definition.

We suspect that in many years, Hunter Water will be able to report full compliance at this reporting threshold but it would not be appropriate to set a zero target for a core standard. A compliance target of 1500 in line with Hunter Water's assessment of properties at risk is recommended. This will ensure that there is no regulatory incentive for action in the marginal areas where a 16 metre design standard was adopted

(b) Service commitments

We recommend that no service commitments for water pressure is applied.

6.3.10 Option B – system performance standard

If our preferred option A were not adopted, then we would recommend a single system performance standards identical to the core standard recommended under option A as set out in section 6.3.9(a) above.

6.3.11 Indicators

Two additional indicators are suggested to complement the data reported of performance against the core standard and service commitment.

- Number of properties that do not receive continuous pressure of 15 metres as a result of abnormal operation of the system

- Number of properties where pressure of less than 15 metres occurs more than once during the report year.

6.3.12 Costs and benefits

There are two significant differences from the present system performance standard that are envisaged to give benefits as follows:

- A core standard with 15 metre threshold will facilitate operational flexibility and a move to lower system pressure if this is shown to be worthwhile for leakage and demand management

- Focussing Hunter Water on the system operating normally will reduce the incentive to invest in excessive system redundancy.

The suggested compliance target is in line with modelled system performance at extreme demand circumstances. By basing the target on extreme demand, headroom has been incorporated indirectly. The proposals are therefore cost neutral or better as there will be less risk of unexpectedly high peak demands triggering the need for system enhancements. If work on the supply and demand balance demonstrates advantages in reduced system pressure, then investment may be needed leading to operating cost savings and contributing to delivering demand reductions.

It has been suggested that customers may see this change as a diminution of standards and a sensitive approach to customer relations will be needed to ensure that the implications for individuals, that are unlikely to be major, are properly understood. Continuing to report against 20 metres as an indicator will enable customers to evaluate the impact of this change over time.

6.3.13 Customer contract

The present customer charter includes provision for rebate of the entire water service charge where more than five confirmed events of pressure below 12 metres head occur.

Hunter Water has suggested that compensation should be included in a revised customer contract and that the trigger pressure should be raised to 15 metres head. We support this proposal that is consistent with our proposed lower reporting threshold.

We suggest that for consistency with the proposed definitions appended, it may be preferable to base it on days when pressure falls below 15 metres rather than events.

7 Sewerage service

7.1 Introduction

In this section, we consider sewage overflows and treated effluent discharges from Hunter Water's sewerage system and their impact both on customers for sewerage services as well as the environment.

Sewage overflows may occur from any part of the system from the point of origin at a property to the final effluent disposal point. They may affect just land alone or water alone or both. In developing our proposals, we have distinguished between:

- *Uncontrolled sewage overflow incidents* from access points such as manholes, gullies and the surcharge gully on the sewer connection and other leaks from defective sewers that show on the surface; and

- *Directed overflow events* from points designed to permit the overflow of sewage when the system is operating under stress; these normally direct the sewage to a water body or into a drain or channel of some kind.

We also distinguish between:

- *Wet weather overflow events* that are a function of the ability of the sewerage system to handle high flows during wet weather ;and

- *Dry weather overflow events* that are a function of the condition of the system leading to blockage and overflows, sometimes only minor.

Dry weather uncontrolled overflow events are a function of system adequacy and impact primarily on customers, not the environment. These issues are considered as matters of adequacy of the service in section 7.2. As regards overflows on private property, both wet and dry events are considered in section 7.2 as customers are unlikely to make such a distinction

Wet and dry weather overflows from directed overflow points and wet weather uncontrolled overflows, other than the extent to which they impact on customers property, are dealt in section 7.3 as an environmental performance issue. Hydraulic capacity constraints which result in overflows can be caused either by increased flows as a result of greater water use from connected properties, new connections or unauthorised (primarily rain water) connections, or from declining hydraulic capacity as assets age.

7.2 Adequacy of sewerage service

7.2.1 Introduction

Sewerage systems are designed to remove wastewater from each connected property continuously and effectively. Provided that the assets have adequate capacity, they generally achieve this very successfully contributing in large measure to public health and hygiene.

Sewerage systems have typically been designed to cope with discharge from the existing population with an additional allowance for growth. Blockages occur from time to time due to physical deterioration of assets or the material being carried; in such cases the sewer backs up and overflows causing both offence and risk to health and hygiene. This may occur either at a manhole or at the surcharge gully on a private connection but sometimes directly from a defect in the sewer.

7.2.2 Existing system performance standards

Hunter Water's licence includes two system performance standards related to adequacy of the sewerage service requiring that:

- 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 the Corporations sewer.

Further details of the data collection and reporting methodology are set out in Hunter Water's system performance and evaluation manual.

The first standard is a reflection of the impact all uncontrolled overflow events from the sewerage reticulation network on both private and public property. The second regulates the impact of such events on customers' property only.

Both dry and wet weather uncontrolled events are measurable in the two standards. Dry weather events occur due to blockages in the sewer, primarily due to tree root problems. Wet weather problems are the result of insufficient capacity to deal with inflow and infiltration.

7.2.3 Historical performance

The following tables show recent performance with respect to the sewage overflow standards.

Since the standard establishing a compliance target of less than 1.4 sewer overflows per km was introduced in 1992/93, Hunter Water has failed to meet the requirement in four years as shown below

Sewer overflows per km								
92/93	93/94	94/95	95/96	96/97	97/98	98/99	99/00	00/01
1.54	1.76	1.64	1.19	1.39	1.64	1.19	.93	1.04
fail	fail	fail			fail			

Hunter Water has always achieved performance in excess of its current system performance standard target of 96% properties not affected by surcharges as shown below.

% properties not affected by surcharges					
95/96	96/97	97/98	98/99	99/00	00/01
97.90	97.77	97.10	98.07	98.80	98.60

7.2.4 Influence on service delivery

While always meeting its compliance target for sewer surcharges affecting private land, in four of the six years from 1992/93 to 1997/98, Hunter Water failed to meet its target of 1.4 surcharges per kilometre of sewer. Through investment and growth, compliance has been achieved over the past three years and Hunter Water is currently considering the practicality of adjusting activity levels to operate closer to its compliance target.

Hunter Water has reported an 18% increase in length of sewer between 1994 and 2000. The effect of this growth has been to increase the allowable number of events implied by the current standard from 4900 in 1993/4 to around 6000 is 2001 contributing towards the achievement of the target. The existing standard for surcharges per kilometre has had a beneficial effect resulting in improved service delivery.

7.2.5 Current standards at Sydney Water

A revised system performance standard has recently been applied to Sydney Water as follows:

"Sydney Water must ensure that in any report year, the number of private properties affected by dry weather uncontrolled overflow incidents does not exceed 25000."

Data for the following additional indicators is also being collected:

- Number of dry weather uncontrolled sewage overflow events in a report year resulting from chokes, third party damage and hydraulic overload
- Response to priority 5 and 6 sewer incidents by time band.

Examples of standards in use elsewhere are given in Appendix F, section 14.3.1.

7.2.6 Customer needs and expectations

In the 1998 Customer Survey, 84% of domestic customers expressed satisfaction with Hunter Water's household sewage disposal service. While this is a high figure, only 1% of customers experience sewage overflows on their land in any year. This begs the question of what it is that some customers find unsatisfactory; it may be perceived poor environmental performance.

Recent research at Sydney Water demonstrated a high expectation that the sewerage system should be maintained so that sewage overflows never occur; 65% support this view earlier qualitative research found that customers thought sewage overflows should not but will happen.

We note that some submissions to the Tribunal, for example that from the Total Environment Centre, have raised the issue of repeat events. We suggest that customers expect repeat events of sewage overflows to be effectively managed and this aspect needs particular attention.

7.2.7 Regional factors

Hunter Water owns the sewer connection pipe terminating at the exit from the shaft that is located just inside the property boundary. In practice it is difficult to determine whether a blockage near to the operational interface is in the customer's shaft or Hunter Water's pipe; it therefore assumes liability for all problems at the shaft. Sydney Water does not own or maintain the connection to individual properties.

There is a significant proportion of low lying, flood prone ground in the urban areas serviced by Hunter Water. This leads to major ingress and infiltration into some of Hunter Water's sewers.

7.2.8 Key issues

The key issues with respect to uncontrolled wet and dry weather overflows are:

(a) Appropriateness of current standards

The two current standards reflect different aspects of performance. Overflows per kilometre emphasise the state of the assets and the overall impact on customers, both on private property and public land. Overflows onto private property emphasise the impact on the individual.

Hunter Water questions the value of retaining surcharges per km as a standard as it considers it to be effectively duplicated by the EPA through its sewer system licence; it suggests it should become an indicator. However at present, the sewer system licence conditions are still being negotiated and how such events will be regulated is not determined. From an environmental perspective, volume of overflows to the water environment is likely to be the primary concern. Customers may be equally concerned with the offence from minor overflows in their neighbourhood that do not reach watercourses.

Our view is that the two standards are complementary, important to customers and both aspects should continue to be regulated through the operating licence. As the primary customer impact measure, we recommend that dry and wet weather overflows on private property should be a core standard with a service commitment for dry weather events on both public and private property.

This is similar to the position at Sydney Water except that line with the general approach for Hunter Water, we place the key customer service measure, overflows on private property, as a core standard and the total overflow events on public and private property as a service commitment. At Sydney Water overflows on private property are regulated as a system performance standard with data on total overflows being gathered with a view to introducing a standard in due course.

(b) Wet and dry weather events

In section 7.1 above, we differentiated between wet and dry weather uncontrolled overflow events. In general, dry weather events are considered as matters of system adequacy and wet weather events as environmental performance issue.

While reported surcharges affecting customers' property will be largely dry weather events due to blockages, customers who are aware of a wet weather event affecting their property are unlikely to consider it any less significant than a dry weather event. We conclude that for Hunter Water, where core standards are intended as primary customer service measures, both dry and wet weather events should be included. This is slightly different to the position at Sydney Water where only dry weather events are included. Comparative data will be available through the proposed indicators

(c) Repeat Events

Historically, there have been between 100 and 300 repeat overflow events each year on customers' property, representing between 5% and 10% of the total events in the year. Overflows from the sewer mains show similar figures.

The offence to customers caused by sewage overflows is likely to be magnified with repeat events. The current surcharges per kilometre standard counts all events including repeats. There are different ways in which repeat surcharges at properties could be monitored or regulated:

- Counting each overflow event affecting a property rather than properties affected; while this recognises repeat events, their importance is not lost because of the preponderance of customers experiencing a single event.

- Counting number of properties affected by more than one surcharge in a 12 month audit period as suggested by Hunter Water; while giving useful indication of the scale of the repeat problem, it does not reflect repeat events spanning the year end.

- Counting number of properties experiencing a repeat overflow in less than, say, 12 months; this gives a more accurate representation of events.

We conclude there should be a separate service commitment related to repeat events so that appropriate attention is given to remedial maintenance or investment. Where there are good databases, our preference is for the last option as it gives a better understanding of the impact of repeat events. This echoes the recommendations for Sydney Water that are being taken forward through its asset management planning framework.

Hunter Water has a comprehensive database and was able to produce the following analysis of repeat events to this definition:

	Number of dry weather surcharge events					
	95/96	96/97	97/98	98/99	99/00	00/01
Total	4444	5104	6103	4110	3490	3968
previous surcharge <12 months before	1089	1155	1434	725	453	574

(d) Speed of response to sewage overflows

Customers generally understand that sewerage systems will fail from time to time but they do expect prompt action to remedy problems. Speed of response is beneficial from both the customer relations and environmental protection standpoint; an indicator is suggested.

7.2.9 Option A – core standard and service commitments

(a) Core standard

We recommend a single core standard for sewerage system performance.

- Hunter Water must ensure that the number of private properties affected by uncontrolled wet and dry sewage overflow incidents does not exceed 6500 properties

- Reporting protocols should be designed to achieve accuracy better than ±5% with 95% confidence limits.

The current standard of 96% compliance equates to some 7500 properties affected by overflow events a year. The lowest performance reported by Hunter Water in the past five years saw about 5350 properties affected excluding repeat events. The recommended definition requires properties to be counted each time they experience an overflow. On average, there have been 400 repeat events on branch and shaft over the past 6 years with a maximum of 718 in 1997/98. There may also be repeat events on the main affecting private property. The suggested target of 6500 properties allows for 750 repeat events at properties plus headroom of around 5%.

Hunter Water has argued that it would have failed this compliance target in the drier years of 1993/94 and 1994/95 even if it had then been applying its current sewer surcharge reduction strategy; assumptions would have strong influence in

this assessment. Our view is that it would be possible for effort to be varied year on year in response to such circumstances.

(b) Service commitments

We recommend two service commitments as necessary to effectively regulate the problems, other than environmental impact, associated with uncontrolled sewer overflows.

(i) Uncontrolled dry weather overflows

This service commitment will regulate all dry weather events caused by problems in both sewer and house connection. While overflows from such events may be of little or no environmental significance, they are important for the offence caused to customers and as a major driver of maintenance and investment.

- Hunter Water must ensure that in any report year, the number of uncontrolled dry weather sewage overflows, excluding directed sewage overflows, does not exceed [5300] events

- Reporting protocols should be designed to achieve accuracy better than ±5% with 95% confidence limits.

The current standard of 1.4 overflows per kilometre equates to some 6000 events per year and 92.5% of all events in the five year period 1996/2001 were dry weather events. The target suggested is the product of these two figures reduced by 5% as this is a service commitment, not a licence standard.

(ii) Repeat uncontrolled dry weather overflows

The offence caused by overflows is magnified when there are frequent repeat events. Therefore we recommend the following service commitment:

- Hunter Water must ensure that in any report year, the number of uncontrolled dry weather sewage overflow incidents, excluding directed overflows, affecting public land or private property, where the time since the last overflow at the same location was ≤ 1 year does not exceed [1500] locations

- Reporting protocols should be designed to achieve accuracy better than ±5% with 95% confidence limits.

Surcharge events where the previous event was in the preceding 12 months have averaged about 900 a year over past six years; the highest year was 1997/98 with 1434 repeat events. The highest levels of dry weather surcharge occur in the year after a very dry year as a consequence of tree root problems. The recommended target of 1500 events allows 5% headroom above the highest figure in the past six years.

7.2.10 Option B – system performance standards

If our preferred option A is not adopted, then we recommend three system performance standards similar to the core standard and two service commitments, essentially repeating the recommendations for Sydney Water.

(a) Impact of sewage overflows on private property

- Hunter Water must ensure that in any report year, the number of private properties affected by uncontrolled wet and dry sewage overflow incidents does not exceed 6500 properties

- Reporting protocols should be designed to achieve accuracy better than ±5% with 95% confidence limits.

A compliance target of 6500 properties is recommended for the reasons set out in section 7.2.9(a) above.

(b) Uncontrolled dry weather overflows

- Hunter Water must ensure that in any report year, the number of uncontrolled dry weather sewage overflows, excluding directed sewage overflows, does not exceed 5600 events

- Reporting protocols should be designed to achieve accuracy better than ±5% with 95% confidence limits.

A compliance target of 5600 properties is recommended for the reasons set out in section 7.2.9(b) above but no reduction in headroom is appropriate for a licence standard.

(c) Repeat uncontrolled dry weather overflows

- Hunter Water must ensure that in any report year, the number of uncontrolled dry weather sewage overflow incidents, excluding directed overflows, affecting

public land or private property, where the time since the last overflow at the same location was ≤ 1 year does not exceed 1600 locations

- Reporting protocols should be designed to achieve accuracy better than ±5% with 95% confidence limits.

Time since the last event on a rolling basis is recommended to ensure that events spanning a year end are reportable. A compliance target of 1600 properties is recommended for the reasons set out in section 7.2.9(b) above, but allowing 10% headroom before rounding up as this would be a licence standard.

7.2.11 Key indicators

Supplementary indicators are suggested to complement the data reported against the core standard and service commitments. Hunter Water already has a good database of sewage overflows by location and property affected. Using this data, three indicators are suggested to give improved understanding of the causes and impact of interruptions:

- Private properties affected by overflows split to type of event
- Dry weather uncontrolled overflows by cause
- Repeat dry weather uncontrolled overflows events by type of property affected.

One further indicator is suggested that while not relating to investment or maintenance effectiveness, does impact on both customer service and environmental performance as follows:

- Response times to priority 1 and 2 sewage overflows.

7.2.12 Costs and benefits

There are three significant changes to the present system performance standard that are envisaged to give benefits as follows:

- It is proposed that the present system performance standard for all uncontrolled overflow events becomes a service commitment for dry weather overflow events; this will ensure an appropriate focus on dry weather problems that require different solutions to wet weather problems; wet weather events are primarily an environmental issue and will be regulated through the EPA licences

- The additional service commitment on repeat events will ensure that this critical aspect of service and performance is given due consideration and the impacts on customers understood and managed appropriately

- The proposals are cast in absolute numbers rather than percentages to ensure that service to existing customers is not permitted to deteriorate as a consequence of growth.

The suggested compliance targets are derived from the current standard adjusted for the revised definition or current performance plus a margin for headroom.

The number of overflows occurring on private property is within management control. To meet the compliance target, increased effort can be applied in difficult years and, as currently being considered by Hunter Water, reduced effort in easier years. By varying effort from year to year, we believe the compliance target proposed would be cost neutral over a period of several years.

The service commitment for repeat events may lead Hunter Water to re-evaluate its current asset management strategy.

7.2.13 Customer contract

Hunter Water has suggested that its current Customer Charter rebate payable in the event of more than three surcharge events on an owners property should be replaced by a contractual commitment triggered if there are more than two events in a year.

Assuming that Hunter Water's preferred approach to compensation is considered appropriate, we accept that the proposed trigger of more than two events is reasonable. A standard or indicator of properties where there are two or more events will reflect system performance and act as a final warning for the business to take more permanent local remedial action; it is appropriate that compensation should be payable in the event of further failures. However we question whether the appropriate period should be a report year, a rolling 12 month period in line with the proposed service commitment or some longer period.

The possibility that Hunter Water might decide not to take permanent remedial action and leave customers suffering overflows on an ongoing basis needs consideration.

7.3 Environmental performance

7.3.1 Introduction

Both the Environmental Protection Agency (EPA) and the Tribunal have interests in Hunter Water's environmental performance. The EPA has responsibility for protection of the environment and in this role, seeks to ensure that the impact of Hunter Water's operations on the environment is constrained to an acceptable level. The Tribunal has responsibility for protecting customers on whom the financial burden of environmental performance lies.

7.3.2 Current system performance standards

There are no numeric system performance standards with respect to sewage transport, treatment or disposal in the current operating licence.

Requirements for the environmental performance of Hunter Water are set out in Environment Protection Licences that are determined and regulated by EPA. Schedule 4 of the operating licence includes the requirement that discharges from the treatment works shall meet the discharge standards set in licences issued by the EPA in respect of these works.

The EPA has issued Hunter Water with system licences for wastewater treatment plants and the related sewer reticulation network. In due course, these will be replaced with new licences prescribing more fully:

- Effluent discharge conditions in terms of quantity and quality as well as wet and dry weather overflow conditions

- Pollution reduction programmes in terms of specific problems to be solved by fixed dates.

7.3.3 Historical performance

Hunter Water reports annually to the EPA on its compliance with the conditions of each licence. It also reports on a restricted range of indicators, principally

through its Environmental Report [16]. Further detail is brought into the public domain by the licence audit report [17].

The operational audit reports give the following data regarding compliance with EPA licences at wastewater treatment works during the last four years:

	Number of works	Number of works with breaches of	
		Limit conditions	Other conditions
1997/98	22	2	13
1998/99	21	5	6
1999/00	21	1	7
2000/01	21	nil	7

The auditors have generally considered breaches of the conditions, other than limit conditions, as minor although they are still technically breaches of both the EPA and Operating Licences.

7.3.4 Influence on service delivery

The EPA licences have a strong impact on Hunter Water capital expenditure programme. Together with growth and other influences, it resulted in major capital expenditure proposals at the 1999 price path determination [18] as shown below:

	2000/01	2001/02	2002/03	2003/04	2004/05	5 year total
Transport	$20.94m	$15.83m	$27.40m	$8.90m	$7.89m	$80.96m
Treatment	$8.49m	$10.09m	$5.76m	$6.71m	$9.68m	$40.73m

However while some objective requirements were in place for improvements at some sewage treatment plant, there was no demonstrable objective linkage between expenditure on the transport system and environmental outcomes.

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[16] Environmental Report 1999-2000; Hunter Water Corporation

[17] 2001/01 Operational Audit of the Hunter Water Corporation; Hyder Consulting; Draft 17 September 2001

[18] New South Wales Water Agencies' Review; Halcrow Management Sciences Limited; December 1999

Therefore while better service delivery in terms of environmental improvements has been achieved, for example the reduction in licence breaches at the sewage treatment plants as shown above, demonstrating that Hunter Water has achieved what was intended for the allowed expenditure would be difficult if not impossible.

7.3.5 Current Standards in use at Sydney Water

There are no standards relating to environmental performance at Sydney Water although the operating licence includes a requirement to comply with EPA licences.

Examples of the approach to this area elsewhere are given in Appendix E, section14.3.2.

7.3.6 Key issues

The key issues with respect to environmental performance are:

(a) Role of the operating licence

The EPA has the primary role for environmental regulation. The Tribunal's role is exercised on behalf of customers and brings together all the pressures on the business that impact on service and charges. We do not consider that specific service commitments for environmental performance should be included in the licence provided that the existing operating licence condition requiring compliance with the EPA licences is retained to ensure that the Tribunal's interests are protected.

(b) Effectiveness of investment

In determining prices, the Tribunal will seek to understand the environmental improvements sought and the works agreed to deliver them. Indicators may be used to establish that the agreed improvements are being delivered by the business. As well as tracking the delivery by Hunter Water of specifically funded works, the Tribunal will also need to consider whether the output improvements sought have been achieved. This can be effected through a range of indicators based largely on data reportable under the Environment Protection Licences. We believe that by monitoring such indicators, a linkage between investment and environmental improvement can be made and the effectiveness of investment tracked.

The need to monitor investment effectiveness is common to all parts of Hunter Water's business. Because of the scale of potential environmental investment and

the role of the EPA in determining the programme, we suggest that the Tribunal's essential interests in monitoring Hunter Water's activities might be clarified in the licence.

7.3.7 Key indicators

We recommend that the Tribunal monitor Hunter Water's performance through a limited range of key indicators. As these are all related to licence consents, to avoid double reporting the data could be collected by the licence auditor under current powers. In fact the auditors already include some of this data in their reports either in text or tabular form.

(a) Sewage Transport System

- Total pollution reduction programme (PRP) actions due for completion by the year end
- Total PRP actions due for completion by year end that are completed before year end
- Total number of breaches of licence consent conditions
- Total breaches of licence consent conditions involving breach of quality or quantity conditions
- Total dry weather overflow events from sewage pumping stations and other such facilities
- Volume spilt in dry weather overflow events from sewage pumping stations and other such facilities
- Total number of catchment overflow events from designed overflow points during wet weather
- Volume spilt in catchment overflow events from designed overflow points during wet weather.

(b) Sewage Treatment

- Total PRP actions due for completion by the year end

- Total PRP actions due for completion by year end that are completed before year end
- Total number of breaches of licence consent conditions
- Total breaches of licence consent conditions involving breach of quality or quantity conditions
- Volume of sewage, per annum, by-passing all or part of the normal treatment facilities.

7.3.8 Costs and benefits

There is expected to be a need to invest heavily in upgrading the sewage transport system for some years to come. While the programme is not yet determined, the suggested indictors are those that we anticipate should, over time, reflect the investment.

Hunter Water is coming to the end of a major upgrade programme at its wastewater treatment works and there will be less improvement to come through in the foreseeable future. The suggested indicators will enable the Tribunal to monitor performance of the works over time.

Hunter Water must continue to respond to the EPA as the regulator of discharges to the environment. There will be no additional capital or operating costs as a result of the Tribunal collecting data on the suggested indicators.

7.3.9 Customer contract

We do not consider that the environmental performance of Hunter Water is relevant to the customer contract.

8 Drainage service

8.1 Introduction

Hunter Water owns and operates some 95 km of stormwater channels and culverts in Newcastle (80 km) Lake Macquarie (4 km) and Cessnock (11km) council areas thus providing a drainage service for a small part of its area of operations.

Responsibility for drainage is divided between several bodies as the assets are part of a larger system. Stormwater collected in street drains owned by the local council enters the channels either directly or via natural watercourses before being discharged into a natural watercourse or open water. Councils' have a responsibility for natural watercourses; sometimes Hunter Water is only responsible for a short length of concrete lined channel in between.

Ownership of these assets, constructed primarily by the Public Works Department, was passed to Hunter Water to maintain at various times over the past 70 years. Hunter Water has no legal duty to upgrade or improve the drainage but must not unreasonably refuse to provide drainage service to existing and potential customers. It raises charges to cover operating costs and depreciation that it levies on customers living in the catchments where it has assets.

8.2 Stormwater system

8.2.1 Existing system performance standards

While there is a requirement for Hunter Water to maintain current capacity of its assets, there are no output requirements either in terms of flooding or discharge water quality.

Because Hunter Water has no obligation to increase capacity of the system, there is pressure on the councils to control inflow to the system. It is normally a condition of new development that run off must not increase, usually achieved by the provision of detention tanks. Fortuitously, the existing provision has become a driver of councils and developers that many will view as beneficial.

The EPA has required the preparation of stormwater management plans by all parties with a responsibility for the system. While acknowledging that proposals to

address stormwater quality will need to address quantity issues and vice versa, the Newcastle plan [19] treats flooding as a secondary issue.

Hunter Water's obligations are included in stormwater management plans (SMP) that also include the obligations of councils and other parties impacting on the drainage system. These obligations, summarised in the Stormwater Environmental Improvement Programme (SEIP) and approved by the EPA, include:

- Cross references to existing obligations on Hunter Water
- Various studies and investigations, some jointly with others
- References to uncommitted works dependent on the studies
- An education programme jointly with others.

The SMP's include the obligations of councils and other parties impacting on the drainage system.

We conclude that the current standards are inadequate. The absence of a formal requirement for flood protection means that the performance of the assets cannot be assessed and improvements considered where necessary. Steps are being taken that could lead to standards for water quality in due course but are likely to leave the present ambiguity regarding responsibilities unchanged. We fear this could exacerbate the problems surrounding the current institutional shortcomings.

8.2.2 Historical performance

Because of its limited obligations, Hunter Water does not maintain any formal records of performance of the stormwater assets.

The stormwater system was originally intended to reduce the risk of property being inundated by stormwater. Hunter Water estimates that in region of 200 to 300 properties in the catchments served by its assets may have suffered above floor flooding in recent years. However there has been no major flood event since 1990.

New developments are designed on the basis of 1 in 100 year flood protection. As part of their development control activity, the councils endeavour to ensure that

[19] Newcastle Stormwater Management Plan; City of Newcastle and Stormwater Trust; July 2000

development does not result in increased run off in flood events thus maintaining risk of flooding around the current level. Hunter Water are unconvinced that this objective is being achieved everywhere.

There is concern that receiving water quality is being compromised by stormwater system. The water quality monitoring study referred to in its SEIP should enable some lead to an understanding of quality performance.

There are interactions between the stormwater and sewerage systems. In wet weather, flooding contributes to inflow to sewers, for example at defective manholes and overloaded sewers may overflow back into the stormwater system. Stormwater is a significant influence on wastewater transport system upgrades.

8.2.3 Influence on Stormwater system

The only influence that the current situation exerts on Hunter Water is that it leads to a maintenance programme to meet the maintenance obligation and pressure on councils to constrain increase in run off.

8.2.4 Current standards at Sydney Water

There are no system performance standards or indicators for drainage service performance currently applied at Sydney Water. Examples of the approach elsewhere are given in Appendix E, section 14.4.

8.2.5 Customer needs and expectations

Hunter Water has not provided any evidence of customer needs or expectations with respect to its part of the stormwater system.

The development of the Stormwater Management plans included a community consultation phase during which environmental, social and economic catchment values were identified. The priority values established were:

- *Environmental*: healthy habitats, enhancement of ecosystems and improved water quality
- *Social*: lifestyle value of receiving waters, recreation opportunities, awareness and safety
- *Economic:* innovation, protection of natural and built assets and sustainable management.

Some public submissions to the Tribunal also refer to stormwater issues. For example, the Total Environment Centre suggests that Hunter Water should meet measurable performance targets with respect to both quantity and quality of stormwater that flows through its drains.

8.2.6 Regional factors

The most significant local factor, albeit similar to Sydney, is the lack of coherent institutional arrangements.

Hunter Water told us that higher intensity rainfall events are experienced in the northern coastal region than elsewhere in NSW. This would only become an issue if a standard for flood protection with application beyond Hunter Water were being considered.

8.2.7 Key Issues

(a) Institutional arrangements

At the workshop held by the Tribunal to discuss Sydney Water's system performance standards and indicators, it was generally acknowledged that the current divided responsibility in the institutional arrangements for stormwater was unsatisfactory. We support this view and understand that Government has recently initiated a review.

The situation is simpler in Hunter Water's region to the extent that in each catchment, only one council is involved. Also Hunter Water provides a drainage service in just three council areas; only in Newcastle is the service of any magnitude. If institutional arrangements are to be altered then there are arguments in favour of a single body having responsibility for managing all drainage assets in a catchment. Where this is not practicable, then the interface points should be minimised and responsibilities of the two parties defined in quantity (including flood risk), quality and financial terms. It may be that different solutions are appropriate in the three council areas where Hunter Water owns drainage assets.

(b) Applicability of standards and indicators

Standards or service commitments with quantified targets should not be introduced to an organisation that has not been given adequate powers with which to ensure compliance. Compliance with a flood standard would depend on investment which Hunter Water has no duty to undertake or control of stormwater entering its system which it is not empowered to require. It would be

inappropriate to set any service commitments for Hunter Water in the absence of better definition of its role and responsibilities.

An indicator of hydraulic performance would be advantageous to demonstrate how existing assets are performing and highlight any deterioration. This would reinforce the pressure on councils and developers to prevent increase in run off stemming from the obligation only to maintain existing channel capacity.

(c) Deliverables

There was no capital investment specifically identified in the 2000 price determination for Hunter Water. The SMP's include a schedule of actions approved by the EPA through the SEIP that Hunter Water is required to deliver. Cash commitments for new obligations are minor.

8.2.8 Key indicators

A comprehensive range of appropriate indicators of the impact of stormwater on receiving water quality may emerge from the proposed water quality study. The other key indicator needed is:

- Hydraulic performance of Hunter Water's stormwater assets.

Initially, hydraulic performance should be monitored by gathering data for each storm event of more than, say, a 1 in 5 year return period intensity, which could include:

- The event return period
- Discharge at key point(s) in the catchment
- Expected discharge in event from hydraulic modelling
- Capacity of the system based on one or more definitions of failure
- Data relating to impact on people and property.

Hunter Water should be obliged to start gathering such data and make it available to the Tribunal when required. It may be appropriate to introduce a formal standard or indicator based on this data in the future.

8.2.9 Additional indicators

It would be useful to have some other indicators of stormwater system performance in the environmental management plan pending completion of the water quality study. The following reflect comments of some stakeholders:

- SMP actions that Hunter Water is required to complete during the year and actions completed at the year end
- Number of discharge points and number protected by trash or sediment traps
- Tonnes trash removed form racks and booms
- Tonnes of sediment removed (ongoing maintenance and special projects).

8.2.10 Costs and benefits

The costs of introducing the indicators suggested would be limited to the administrative costs of data collection, analysis and reporting.

Attention is being focussed on water quality issues associated with stormwater system performance by the EPA's requirement to introduce SMP's. While at present the cost impact on Hunter Water's customers is minimal, the early establishment and development of indicators would start to provide a basis for the establishment of targets and monitoring improvements if investment is pursued.

As stated in the Newcastle stormwater management plan, quality and quantity issues should be dealt with simultaneously but the current plan concentrates on quality issues; quantity issues are not adequately addressed. While a service commitment in terms of flood risk would be an appropriate way of starting to focus attention onto quantity issues, it should only be introduced in the context of institutional reform.

We suggest a flooding standard should be considered in advance of, not in response to, a major flood event.

8.2.11 Customer contract

Given the low numbers of properties that Hunter Water has identified as having suffered above floor flooding as well as the divided responsibilities, we conclude that stormwater flooding is not appropriate for the customer contract. Hunter Water should be prepared to deal with any claims arising from flooding on a case by case basis in conjunction with the council in the area.

9 Customer service indicators

9.1 Introduction

In previous sections we have considered customer service delivered by the infrastructure and systems resulting from the way in which they are designed, operated and maintained by the business. This section considers customer service delivered by the business systems and the administrative functions, mostly resulting from direct interaction between customers and employees.

9.2 General considerations

9.2.1 Evidence of customer needs and expectations

Hunter Water has not provided any data on customer needs and expectations with respect to customer service. In its submission to the Tribunal, Hunter Water makes reference to research that has lead it to certain conclusions on customer contact elements of service delivery. We understand that it was referring to focus group work done some time ago but it has not been able to make the results available as they were not documented.

We reviewed the 1996, 1997 and 1998 customer surveys. Hunter Water ceased regular annual surveys after 1998; further research was carried out in June/July 2001 but these results have not been made available to us.

Some general questions with respect to customer service were included in the earlier surveys. Of some relevance to this review is one indicating that the percentage of customers agreeing that Hunter Water is improving its customer service declined from 54.3% (1996) to 49.9%(1997) and 41.1% (1998). However this was related to an increase in "don't know" responses rather than an increase in customers disagreeing.

Submissions to the Tribunal have included many references to customer service and we have been able to discuss these with some of the stakeholders concerned. Further details are given in the sections that follow. We note that the Department of Energy and Utilities, the Department of Fair Trading, PIAC and others support the concept that Hunter Water should have similar obligations to Sydney Water in respect of customer service.

9.2.2 Operational Audit data

In accordance with the Tribunal's requirements, the 2000/01 operational audit report contains some comment and data on customer service.

The most significant findings of the audit for present purposes are in relation to systems and procedures for monitoring and managing customer contacts including complaints. Past audits have highlighted the need to integrate the information gathered from the Asset Operation and Maintenance System (AOMS) and Customer Services System (CSS) to enhance analysis of complaints and provide strategic information on customer service. While progress has been made, it is constrained by the need for a major enhancement to the CSS database. Hunter Water is currently investigating the options.

The report also suggests that as part of the Operating Licence review, the following issues should be addressed:

- Comparability of standards in the licence and customer charter
- Integration of the process for handling all customer enquiries
- Back contact with a sample of customers who have contacted Hunter Water to establish satisfaction
- Management improvements to address repeat problems and long term issues of service standards.

These matters are considered further at appropriate places in this report.

9.2.3 Business systems at Hunter Water

Hunter Water has four business systems that relate to customer service.

(a) Telephone call system

Hunter Water's call centre uses a telephone system installed in 1997. It is manned from 07.00 to 18.00 on weekdays and during these hours, all incoming calls are answered there. It has 10 workstations but a further 14 workstations elsewhere can log into the system and take calls if required. A further 5 workstations are being added at a remote location for emergency use.

There are 45 incoming lines in total, some being designated as incoming only. There are two customer contact numbers with separate call queuing as well as the general switchboard number:

- An accounts and general enquiries number - a recorded message is played when the call centre is closed

- An emergency and service number – this line is transferred to the operations control room when the call centre is closed.

A statistical analysis package is available to monitor telephone performance and is programmable to give different output as needed.

A separate accounts payment number that is largely "interactive voice response" (IVR) driven is available for electronic payment of accounts. This facility is contracted out.

(b) Billing system

The current billing system was installed some 17 years ago. With modification and extension over the years, it continues to fulfil its prime function. However it lacks the flexibility and functionality of systems now available. In particular, it is not possible to log all customer billing enquiries; those that are dealt with at first point of contact are not recorded. While total calls to the call centre are known, billing queries cannot be distinguished from general enquiries that come through to the same number.

(c) Customer Services System (CSS)

The CSS is a subsidiary system that was added to the billing system to record complaints and queries, other than those relating to operational problems, which cannot be dealt with at first point of contact. Some complaints may be resolved at first point of contact and Hunter told us that these should also be recorded. Hunter Water has identified that major changes are needed and is reviewing the options.

(d) Asset Operation and Maintenance System (AOMS)

Service problems reported by customers are logged in the AOMS and categorised by type. The system appears to be working satisfactorily apart from the problems of integration with the CSS.

9.2.4 Approaches to customer service indicators

There are many different ways to regulating customer service although the range of measures against which it is judged is limited. Examples of the different approaches are given below.

(a) UK (England and Wales)

Ofwat [20] monitors four primary customer performance indicators covering billing contacts, written complaints, bills for metered customers and ease of telephone contact.

In addition, the companies are required to provide guaranteed standards for keeping appointments, response to written account queries and complaints. Data is collected on payments made under this scheme.

No formal compliance targets are set for these indicators, however, grading into bands, publication of comparative performance and direct intervention for companies performing below a minimum acceptable level provide strong incentives to improve performance. Customer service is also considered within the price setting process; at the 1999 periodic review good service was rewarded and poor service penalised.

(b) UK (Scotland)

In Scotland with effect from October 2000, guaranteed minimum standards relating to complaints, billing matters and appointments have been imposed by the regulator, the Water Industry Commissioner for Scotland [21]. Ex gratia payments are required for less common customer service failures. No data on performance is yet available.

(c) Melbourne

The licensees' customer service obligations are set out in their customer contracts, which are approved by the Office of the Regulator General. The Office sets minimum standards in its benchmark customer contract, and encourages innovation by requiring the licensees to review their contracts annually in

[20] Levels of Service for the Water Industry in England and Wales 2000-2001; Ofwat; July 2001; http://www.ofwat.gov.uk

[21] http://www.watercommissioner.co.uk/

consultation with their customer committees and publicly reporting on general compliance with contract obligations

While the Office does not set official minimum standards of service for customers, the strong comparative competition between the businesses acts as effective incentive. Any problems are highlighted in an annual performance report [22], balanced by commentary on initiatives taken improve customer service.

The licensees are required to carry out a customer survey at least once a year and publish the results annually. There is some standardisation of the questions used by the three licensees.

It is intended that the functions of the Office will be transferred to an Essential Services Commission in due course.

(d) Perth

The licence issued by Office of Water Regulation in Western Australia [23] requires the Perth utility, Water Corporation of Western Australia, to meet prescribed standards for answering telephone calls to its customer contact number and for resolving written complaints.

Performance data against a range of performance indicators including complaints is collected and published [24] in the form of a comparative performance report for a number of West Australian water utilities but the latest report does not include any data on customer service indicators apart from water quality complaints.

The Regulator also has powers to order the Corporation to commission an independent customer survey.

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[22] Melbourne's retail water and sewerage companies; Performance report July 1999- June 2000; February 2001; http://www.reggen.vic.gov.au

[23] Water Services Co-ordination Act 1995; Operating Licence; Water Corporation of Western Australia; 29 June 2001: http://www.wrc.wa.gov.au/owr/industry/servprov.htm#link28

[24] Statistical profile and performance benchmarking of water supply services in 32 major Western Australian towns

1999/2000; Office of Water Regulation, Government of Western Australia; June 2001

(e) Adelaide

Complaints are subject to minimum response requirements at SA Water. Response time required varies dependent on the severity of the problem varying from two to 24 hours. Resolution of complaints is not regulated.

9.2.5 Indicators in use elsewhere

In the following table, we summarise the indicators currently in use in some major Australian cities in Australia and the UK.

Indicator	Sydney Water	Melbourne (Yarra Valley)	Perth (Water Corp.)	England & Wales	Scotland
Written complaints			√	√gtd	gtd
All complaints	√	√	√	√	
Phone answering	√	√	√	√	
Disconnections	√	√		√gtd	
Metered a/c	√			√gtd	
Account contacts	√			√	gtd
Appointments				√gtd	gtd
Correspondence		gtd			

N.B. gtd means performance is guaranteed in some way

Further details are given in Appendix E, section 14.5.

9.2.6 Alternatives to indicators

In discussion, Hunter Water has raised the possibility of using standardised customer surveys as well as or instead of measurable indicators to compare organisations. Customer surveys are sometimes required by regulators and used as an indicator of performance, for example in Melbourne where the three retailers use standardised questions. To ensure complete independence from the business and appropriate standards, Ofwat has commissioned its own surveys from time to time.

Customer surveys are a valuable tool for a business but are only as good as the questions asked and people surveyed. For regulators they are likely to raise more questions than they answer. We refer elsewhere to unexplained trends in Hunter Water data for 1996 to 1998 and gaps between perception reflected in expressed opinion and actual service. Customer opinions do not simply reflect customer service but are related to a wide range of factors that are not necessarily within the control of the business. For example, we have had experience of problems at one water business resulting in a significant improvement in customer perception of a neighbouring business.

Nevertheless consideration of qualitative survey data can provide useful insights into areas of customer service that could be improved. For example they may bring to light a perceived failure in customer service not currently subject to quantitative audit. They are also useful indicators with regard to changing needs and preferences. Qualitative surveys should play a role in the provision of high quality customer service.

We suggest that while it is appropriate that Hunter Water should be required to consult its customers including customer surveys, as in the present licence, and make the results available to the Tribunal, prescriptive requirements are inappropriate.

9.2.7 Proposed approach

Customer service delivered by the business and administrative systems is a core function of a water and sewerage utility of equal importance to getting water to the customer and dealing with sewage effectively. We recommend that indicators be introduced for the most important customer contact points, viz. complaints, phone answering, affordability, metered a/c and account contacts.

Measurement of these dimensions of customer service can be achieved with reasonable accuracy and without excessive cost with fully functional business systems now in common use. There are constraints at Hunter Water in that some of business systems are not fully functional while still delivering on their prime purpose.

9.3 Complaints

9.3.1 Evidence of customer needs and expectations

In its submission to the Tribunal, the Public Interest Advocacy Centre (PIAC) argues that a transparent and objective process for handling customer complaint

and concerns should be included in Hunter Water's customer contract. Hunter Water has not provided any evidence of customer needs and expectations.

9.3.2 Operational Audit data

The 2000/01 Operational Audit Report contains a review of Hunter Water's complaints handling policy and management systems. In 2000/01 1203 complaints were logged (c.f. 1083 in 1999/2000); these are separately reported in 41 categories. The auditors carried out a small survey of complainants and comment that, with a few notable exceptions, the general view was that Hunter Water's customer service was acceptable.

Hunter Water also gave us an analysis of complaints received in 2000/01 by method of receipt:

Method	**Number of complaints**	**% of total**
Letter	131	11%
Personal visit	53	4%
Phone	995	83%
Application	12	1%
Ministerial	2	<1%
Total	1193	

These numbers appear low and there may be value in focussing audit attention on this area to add confidence that numbers are accurate.

9.3.3 Local factors

Hunter Water has systems in place to record all telephone and written complaints. The Operational Audit Report did not identify any deficiencies. Our only reservation is that it is not practical for an auditor to confirm that complaints resolved at the first point of contact are recorded because the current systems do not allow all contacts to be recorded.

9.3.4 Proposed indicator

The absolute number of complaints received by an organisation is a poor indicator of customer service. If there are administrative barriers to complaints, for example

referring them to a single point of contact, or a perception in the community that they are not taken seriously, then customers may be reluctant to make the effort to lodge a complaint. An increase in the number of complaints might result from removing such constraints and, we argue, mean better customer service is being delivered. Some qualitative audit may be helpful in establishing the appropriateness of the complaints process.

Trends in complaint after allowing for such factors are significant and warrant careful analysis.

Customers do want a speedy and satisfactory resolution of their complaint. Therefore we believe that reporting against an indicator of response time to complaints received should be introduced.

The identification and correct logging of telephone complaints on a consistent basis may require Hunter Water to undertake staff training programmes periodically. Such matters should be dealt with in the reporting protocols. Auditing of telephone complaint data is troublesome as if numbers are viewed as suspiciously low, they are difficult to verify; sound protocols and good training help substantiate such numbers.

We recommend that the following indicator be applied:

Time to provide a substantive response to complaints by time band:

- Percentage less than two days
- Percentage less than five days
- Percentage less than ten days.

9.3.5 Costs and benefits

Hunter Water already has systems in place for recording numbers of complaints. This system does not have the capability of tracking the time to resolution of complaints but Hunter Water is currently investigating an enhanced customer care system to provide such data. This enhancement appears overdue but to ensure cost neutrality, it may be necessary for Hunter Water to use a sampling system for the present.

The proposed measure will focus attention on the speedy resolution of complaints to the satisfaction of customers and hence is a good reflection of customer service.

It is sometimes argued that the organisational response may be to emphasise speed rather than quality of response. Such behaviour can be constrained by requiring the operational auditor to consider a sample of complaints to ensure that a substantive response has been made. Follow up sample surveys by the business as suggested in the operational audit report can add assurance that no further contact from customers means they are satisfied with the first response.

9.3.6 Customer Contract and customer charter

Swift and effective complaints handling is a hallmark of all customer focussed service businesses and therefore should be referred to in the customer charter. The proposed indicator would show how Hunter Water discharges this obligation.

Some regulators also require guaranteed response times for written complaints. Written complaints were only 11% of the total complaints in 2000/01 at Hunter Water and the tendency is for more customers is to pursue complaints by telephone. We do not think it appropriate that guaranteed standards should apply to one and not the other, a complaint should be treated equally seriously whatever medium the customer chooses to use to transmit it.

9.4 Telephone calls

9.4.1 Evidence of customer needs and expectations

Hunter Water has not provided any evidence of customer needs and expectations in respect to telephone contacts.

9.4.2 Operational Audit data

There is no data in the operational audit report relating to telephone performance. Hunter Water gave us the following snapshot of performance in August 2000 and 2001:

	Customer service		Emergency and service faults	
	Aug 2000	Aug 2001	Aug 2000	Aug 2001
<20 seconds	70.2%	67.1%	70.3%	66.7%
<60 seconds	87.4%	86%	86.4%	87.2%
Total calls	16745	9440	1782	1565
Calls abandoned		3.2%		2.8%

Comparative competition has led water businesses elsewhere to deliver higher answering performance.

9.4.3 Local factors

Hunter Water has a smaller customer base to Sydney Water and consequently a smaller call centre is adequate to deal with calls received in normal circumstances. It argues that this needs to be taken into consideration when considering telephone performance. We agree that in the event of a serious incident, it would be more likely that its call centre would be overloaded. However examination of data from the UK indicates that size is not a significant factor in the ability to deliver consistently high levels of telephone performance. Whatever the size of business, the reasons for any downturn in telephone answering performance should be considered when considering the appropriate reaction.

Hunter Water's telephone system has a constraint in that it can only monitor calls answered in two second increments. It cannot measure an odd number of seconds response time such as the 15 seconds threshold commonly used.

9.4.4 Proposed indicator

Customers currently use the telephone as their first choice means of communication with utility businesses. A customer focussed business will want to ensure that it facilitates telephone communication. It needs the calls to run its business efficiently; for example it is quicker to deal with a change of address by phone rather than by letter.

We recommend that Hunter Water should report the total number of telephone calls received and those answered:

- Within 15 seconds
- Within 30 seconds but after 15 seconds
- After 30 seconds.
- Total time when all incoming lines are busy and callers receive the busy tone.
- Total number of calls abandoned.

We suggest that the constraint in Hunter Water's telephone monitoring system could be overcome by monitoring at both 14 second and 16 seconds and reporting the average.

9.4.5 Costs and benefits

Hunter Water already has appropriate capability to report on telephone answering performance. There are therefore no additional costs associated with introducing this indicator. Hunter Water may, at its discretion, consider it appropriate to improve response times; this could for example mean manning additional workstations at peak periods. This could have some cost consequences.

Customers' perception of a business is influenced not only by the primary service provided but also by the absence of minor irritations. Customers expect to be able to make telephone contact quickly and easily; ensuring easy telephone access is one means of reducing the irritations that will contribute to that customer's overall perception of the business.

9.4.6 Customer Contract

We believe that telephone answering performance is something that is most relevant at the macro level, there will always be busy times when a few customers may have to wait for their call to be answered. It is neither reasonable nor practicable to try and deliver a specific performance to every customer, and impractical to compensate the minority who have to wait. We do not recommend that this should be included in the customer contract.

9.5 Affordability

9.5.1 Evidence of customer needs and expectations

There is no specific evidence of customer needs and expectations in respect of measures related to affordability indicators. A submission from Port Stephens Council suggests that there is need for Hunter Water to develop its debt and disconnection policy but Hunter Water already make some of the facilities suggested available. It is possible that the debt and disconnection policy and publicity should make more specific reference to such matters as instalment plans.

9.5.2 Operational Audit data

There is no data in the operational audit report with respect to affordability. Hunter Water has not provided data sought by the Tribunal in the annual information return.

9.5.3 Local circumstances

Hunter Water's approach to debt and disconnection is outlined in its submission and it believes this should be set out in its customer contract.

It informed us that its systems did not distinguish between flow restriction and disconnection but that the latter were so few that they could be counted manually. It does not offer any subsidised payment facility such as Sydney Water's payment vouchers.

9.5.4 Proposed indicators

Affordability of monopoly utility services is a high profile issue on which the business needs to be able to demonstrate its approach and performance to regulators, customers and those who represent them. Unique among the utilities, water is essential to life and therefore water businesses will be subject to particular scrutiny. The following indicators are recommended:

- Disconnections
- Flow restrictions
- Number of debt recovery actions
- Customers assisted though payment support.

9.5.5 Costs and benefits

Indicators can be used to gain some understanding of the complex issue of affordability and the efforts made by a water utility to reflect the social needs of its customer base. In a briefing note on regional considerations, Hunter Water draws attention to the fact that its area of supply is less affluent than the rest of NSW. Affordability indicators are a good means for the Tribunal to ensure that Hunter Water is responding appropriately to the needs of its customers in these particular local circumstances.

There is difficulty in distinguishing between customers who simply cannot pay and others who have decided they will not pay their bill but between these extremes are those whose problem is one of managing their financial affairs. Flexible instalment payment facilities and payment support are sometimes provided by the utility to assist customers in difficulty. The inclusion of an indicator of payment assistance provided may lead to Hunter Water considering the introduction of such a facility

at its discretion. There should be no material costs in reporting on these indicators.

9.5.6 Customer contract

The proposed indicators will need to be considered in conjunction with debt and disconnection policy that may be included in the customer contract.

9.6 Meter reading

9.6.1 Evidence of customer needs and expectations

Hunter Water has not provided any evidence of customer needs and expectations in respect to meter reading.

9.6.2 Operational Audit data

There is no data in the operational audit report with respect to meter reading.

9.6.3 Local circumstances

Hunter Water's billing system cannot distinguish between company and customer meter readings. Until it installs a fully functional billing system, an indicator based on distinguishing between company and customer meter readings as applied at Sydney Water is impractical.

9.6.4 Proposed indicators

Hunter Water has its own meter readers and current policy strongly emphasises the benefits of obtaining actual readings within the normal schedule. We believe there would be advantage in introducing a meter reading indicator to ensure that current performance is maintained. We suggest the following indicator:

- The percentage of metered accounts receiving a bill not based on an actual meter read during the report year

9.6.5 Costs and benefits

Meter reading, policy may receive scrutiny in the pursuit of efficiency, for example, if the first attempt at a reading is unsuccessful, no further attempt is made and an estimated bill submitted. Problems can arise if the estimated usage is incorrect. Either the customer is being overcharged or when an actual reading is obtained,

will be faced with a substantial unexpected account. These effects would be more acute in Hunter Water's region given the economic circumstances it has outlined.

The benefits to customers are in ensuring that the impact of the meter reading policy is transparent so that the Tribunal can consider the implications of any trends.

9.7 Account contacts

9.7.1 Evidence of customer needs and expectations

Hunter Water has not provided any evidence of customer needs and expectations in respect to metered accounts.

9.7.2 Operational Audit data

The Audit Report gives some relevant data on customer service calls to Hunter Water as follows:

Call type	**Definition**	**Approx. number p.a.**
General Query	Calls answered immediately	105000
Enquiry	Requires further information to customer	6000
Complaints	Dissatisfaction	1200
Service emergency	Requires infrastructure action	40000

The suggested indicators of telephone performance will give confidence that the numbers reflect all attempted customer contacts, not just those that are answered.

9.7.3 Local circumstances

Hunter Water cannot record all customer account contacts within its current billing system; this system was installed seventeen years ago when this degree of functionality was not normally available. This compromises its ability to report information on account contacts.

9.7.4 Proposed indicators

As with complaints, the number of times customers choose to contact their water service provider is a poor indicator of customer service although any trends or peaks should be investigated for identification of possible systemic problems.

Customers do want enquiries dealt with speedily and effectively. Therefore we suggest that reporting against an indicator of response time to account contacts received should be introduced as follows:

The percentage of substantive response to account contacts provided in:

- Less than one day
- Less than five days
- Less than ten days.

In order to ensure that this does not drive a new billing system when the existing still has some useful life, we suggest that reporting protocols on a sample basis are developed to achieve a ± 10% accuracy.

9.7.5 Costs and benefits

Hunter Water received some 105000 general queries in 2000/2001 [25] or one call for every 1.9 customers. Such contacts are the most frequent reason for a customer to contact their utility service provider. Although many of the contacts are routine matters, dealing with them efficiently and effectively is a vital element of customer service. For the business, it is one of the best means of giving customers a positive impression of the business and therefore influencing perceptions.

Because of the limitations of its billing system, we have suggested a low accuracy requirement that will enable it to report on a sample basis; the methodology will need addressing in its reporting protocol. Although there may be some loss of productivity on days when records are being kept, this should not be excessive. Overall, any loss should not be material.

[25] 2000/01 Operational Audit of Hunter Water; Hyder Consulting; Draft; 17 September 2001

10 Appendix A – Issues and Objectives

10.1 Issues raised by the Tribunal

The Tribunal has developed an Issues Paper for the review of Hunter Water's Operating Licence and the key issues that have been identified in relation to the system performance standards are:

- Are the current system performance standards appropriate?
- Should any additional standards or indicators be included?
- Are the current standards adequately defined and appropriately measured?
- Do the standards reflect customers needs and preferences?
- Do the standards provide sufficient incentives for Hunter Water to improve its performance?
- What are the costs and benefits of amending the performance standards and including indicators?

In regard to customer service, the key issue to be addressed by the consultancy is:

- Should any additional obligations to consumers be included in Hunter Water's Operating Licence?

The Issues Paper also raises specific questions in relation to individual standards and identifies areas where supplementary measures could be introduced. The consultancy should consider these additional issues when addressing the objectives.

10.2 Objective Of Consultancy

The objective of this consultancy is to advise and report to the Tribunal on appropriate system performance standards (water pressure, water discontinuity, sewer overflows etc) and indicators (customer service) for inclusion in Hunter Water's Operating Licence and Customer Contract.

It should be noted that this consultancy follows major investigations, reports, public workshops and public submissions that occurred as part of IPART's reviews of Sydney Water Corporation's Operating Licence and Customer Contract. It should also be noted that Hunter Water provided submissions to these reviews covering key principles to be established and attended each of the public workshops.

In preparing its advice the consultant should consider system performance standards and customer service indicators separately. The Tribunal is open to consortium bids for the consultancy.

In regards to the system performance standards, each of the following areas must be addressed:

1. Examine and evaluate Hunter Water's historical performance against the existing system performance standards.

2. Assess whether the existing system performance standards are adequately defined and measured.

3. Evaluate any available research and data (including public submissions to the Tribunal and representations at the Workshop), to assess whether the existing standards are relevant to customer needs and expectations.

4. Assess whether the existing standards help ensure that Hunter Water has robust systems in place to deliver water and sewerage services.

5. Consider whether the performance standards and indicators used by Sydney Water and other water utilities are relevant and appropriate for Hunter Water.

6. Consider the significance of regional factors in considering the appropriateness and feasibility of any amendments to Hunter Water's current performance standards.

7. Evaluate the costs and benefits arising from any amendments to the existing standards, the introduction of new standards or supplementary indicators, within an overall cost neutral framework. The impact on both Hunter Water and the broader community should be considered. This will involve consultation with Hunter Water to determine the effects of new or alternative measures on infrastructure in the short and long term.

8. Having considered the above factors, make recommendations as to appropriate amendments to Hunter Water's performance standards.

In addition to recommendations on system standards, the consultant is to recommend introduction of systems indicators which would provide supplementary information to the Tribunal on system performance including drainage services.

In regard to customer service indicators, each of the following areas must be addressed:

1. Consider whether customer service measures used by other water utilities are relevant for Hunter Water. The review of Sydney Water's system performance standards conducted by Halcrow Management Sciences Ltd includes some comment on customer service and is available on the Tribunal's website for reference purposes.

2. Analyse the merits of indicators, and suggest whether they should be introduced to provide a measure of Hunter Water's customer service.

3. Evaluate any research and evidence of customer needs and expectations with respect to customer service levels. This information will be provided through Hunter Water's customer research, in public submissions and at the Workshop.

4. Consider the results and recommendations from Hunter Water's Operational Audits in relation to customer service.

5. Evaluate the merits and feasibility of the recommendations from the public submissions to the Tribunal, and from the Workshop to be conducted by the Tribunal.

6. Estimate the costs and benefits as a result of the introduction of supplementary indicators for Hunter Water and the broader community, within an overall cost neutral framework. This will involve consultation with Hunter Water to determine the effects in the short term and long term.

The objective of the study is to propose system performance standards that reflect Hunter Water's current level of performance. The consultant's recommendations should avoid imposing unreasonable costs on the Corporation and its customers. The next pricing review for Hunter Water will provide the opportunity to address the trade-off between performance standards and higher prices and customer willingness to pay for higher standards.

Hunter Water is preparing information packages that relate to their historical performance against existing standards, the verification of the accuracy of measurement of those standards and alternative standards and indicators that will be considered for system performance and customer service. The Consultant will be required to consider these packages as a basis for discussions with Hunter Water.

All recommended standards and indicators must be accompanied by relevant definitions and measurement procedures to ensure accurate interpretation.

The consultant, while maintaining an independent view, should be able to enlist Hunter Water's co-operation, and also engender a sense of acceptance of relevant outcomes by Hunter Water.

11 Appendix B – Core standards

11.1 Water service continuity

11.1.1 Core standard

- Hunter Water must ensure that the number of properties incurring discontinuity of water services for more than 5 hours cumulative duration annually does not exceed 13500 properties
- Reporting protocols should be designed to achieve accuracy better than ±5% with 95% confidence limits

11.1.2 Definition

- A report year commences on 1 July each year and concludes on 30 June the following year.
- A reportable property is one affected by one or more shut off of water supply during a year regardless of duration or cause where the cumulative duration of all interruptions exceeds 5 hours
- Shut off means a total loss of water supply and begins at the earliest of either when Hunter Water was notified of an interruption or when valve isolation commences
- A planned shut off commences at the time specified in the notice
- A shut off ends when normal supply is restored
- Exclude shut offs at single properties caused by meter malfunction, difficulties in Hunter Water's service pipe or customers own pipework
- Planned means notice has been given in accordance with the customer contract
- The number of reportable properties from an incident shall be estimated by counting each property from the best available database taking account of pressure data where relevant
- Where connected properties are in multiple occupancy, each separately billed or occupied part shall be counted as one connected property
- Connected premises currently unoccupied shall be included

11.2 Water service pressure

11.2.1 Core standard

- Hunter Water must ensure that the number of properties connected to the water system that do not receive continuous water pressure at the main tap above 15 metres with the system operating normally does not exceed 1500 properties
- Reporting protocols should be designed to achieve accuracy better than ±10% with 95% confidence limits.

11.2.2 Definition

- A report year commences on 1 July each year and concludes on 30 June the following year.
- A reportable property is one where pressure falls below the relevant reporting threshold for a continuous period exceeding 15 minutes during the year as a result of inadequate system capability under normal operating conditions or as a result of operational problems that are not remedied within 4 consecutive days.
- All incidents of low pressure whether reported by customers or identified by Hunter Water's own systems are to be included as reportable.
- System capability means the ability of the water supply system, under normal operating conditions, to adequately meet all customer water demands on the system up to and including maximum hour demands.
- Maximum hour demand is zone specific and is the maximum sum of all customer demands on that water demand zone occurring over a one hour period on the maximum consumption day of the year.
- Normal operating conditions exclude short-term operational problems, such as main breaks and circumstances of abnormal demand, such as fire fighting.
- A main tap is the point of connection of the customer's service to the Hunter Water main
- Where connected properties are in multiple occupancy, each separately billed or occupied part shall be counted as one connected property
- Connected premises currently unoccupied shall be included

11.3 Sewage overflows on private land

11.3.1 Core standard

- Hunter Water must ensure that the number of private properties affected by uncontrolled wet and dry sewage overflow incidents does not exceed 6500 properties
- Reporting protocols should be designed to achieve accuracy better than ±5% with 95% confidence limits.

11.3.2 Definition

- A report year commences on 1 July each year and concludes on 30 June the following year.
- An uncontrolled sewage overflow incident is where there is visible evidence of sewage on the surface, however minor
- Only overflows that are notified to Hunter Water or identified by its employees are to be included
- Where connected properties are in multiple occupancy, each separately billed or occupied part shall be counted as one connected property
- Private property means all property privately owned or used for private purposes
- Private property currently unoccupied shall be included
- Where a private property is affected by more than one overflow in a report year, the property shall be counted each time it is affected

12 Appendix C - Service commitments

12.1 Supply and demand balance

12.1.1 Demand management [26]

Hunter Water must ensure that over a price path period, the sum of metered consumption saved calculated by customer sector and leakage saved is not less than [to be determined] Ml

- reporting protocols should be designed to achieve accuracy better than ±10% with 95% confidence limits

The following definitions apply:

- Metered consumption saved is the difference between climate corrected base year billed metered consumption plus growth and climate corrected final year billed metered consumption excluding large customers
- A large customer is one supplied via a meter of 150mm nominal diameter or larger
- A price path period means the time between the base year and final year of that period
- Base year means the last full year before a price determination for which data is available
- Final year means the last full year before the next succeeding price determination for which data is available before prices are determined
- Billed metered consumption is the water billed to customers based on meter or estimated meter readings
- Climate corrected means actual consumption has been adjusted for climate variance from the norm

[26] If this service commitment were implemented as a system performance standard under option B, then it should be applied on a report year basis and the wording amended accordingly

- Growth is the product of base year metered consumption and the final year number of metered customers pro rata to base year number of metered customers weighted by the manufacturer's rated maximum continuous flow for each meter size and type in use

- For customers having a meter of 150mm diameter or greater, metered consumption saved means the water savings identified in an audited report as having been achieved over the price path period where it has been agreed in advance with the Tribunal that such savings will count towards the target

- Customer sector means residential customers sub-divided into houses, flats, other residential property and non residential customers sub-divided into domestic use only, cyclical wet, cyclical dry, non cyclical wet and non cyclical dry industry together with such additional sectors or sub-sectors as agreed

- Where a customer commences to take reused water in a price path period, then the meter may be included in calculating growth but excluded from the final year billed metered consumption

- Where a customer is taking reused water in the base year, then the meter shall be included in calculating growth and the consumption included in the base year billed metered consumption but the final year billed metered consumption shall be the lesser of base year metered consumption or final year metered consumption.

- Reused water means treated effluent from a wastewater treatment plant that is supplied direct to a customer in lieu of potable water

- Reused water that is taken for irrigation and the relevant reused water meter shall be excluded except where reuse water is taken in substitution for water from the potable mains

- Leakage saved means real losses in the base year less real losses in the final year

- Real losses means billed metered and unmetered consumption less unbilled metered and unmetered consumption and unauthorised consumption together with an adjustment for customer meter inaccuracy

- The methodology and assumptions on which unbilled metered consumption, unbilled unmetered consumption, unauthorised consumption and customer metering inaccuracies are based shall be set out in the reporting protocol

12.1.2 Security of supply

Hunter Water must maintain and provide works sufficient to meet:

(a) a probable occurrence of drought in a report year (requiring the imposition of water restrictions) at no less than 10 yearly intervals

(b) a probable duration of drought in a report year (requiring the imposition of water restrictions) of no more than 1 month in 20 (5%)

The following definitions apply:

- A report year commences on 1 July each year and concludes on 30 June the following year.
- The probability of drought shall be based on actual water system inputs in the report year and previous years
- Probabilities shall be calculated from computer modelling of extended time series data of exogenous factors, demand forecasts and operating procedures as set out in the reporting protocol.

Note: No accuracy requirement is suggested due to the difficulty of making any meaningful assessment; the reporting protocol should be assessed against best practice

12.2 Water service

12.2.1 Unplanned interruptions

Hunter Water must ensure that in any report year, the number of properties connected to its water supply system that are affected by an unplanned shut off of water supply exceeding 5 hours does not exceed [4000] properties [27].

Reporting protocols should be designed to achieve accuracy better than ±5% with 95% confidence limits

The following definitions apply:

- A report year commences on 1 July each year and concludes on 30 June the following year.
- A reportable property is one affected by a shut off of water supply exceeding 5 hours
- Shut off means a total loss of water supply and begins at the earliest of Hunter Water being notified of an interruption or when valve isolation commences
- A planned shut off commences at the time specified in the notice
- A shut off ends when normal supply is restored
- Exclude shut offs at single properties caused by meter malfunctions or difficulties in the customers own pipework
- Where a property experiences multiple shut offs exceeding 5 hours in a report year, it shall be counted as a reportable property in the appropriate category each time
- Planned means notice has been given in accordance with the customer contract and the terms of the notice adhered to

[27] the target should be 5000 properties if this is applied as an Option B licence standard

- Unplanned means that notice has not been given in accordance with the Customer Contract or where the terms of such a notice are not adhered to and includes such events caused by third party damage and power failure

- The number of reportable properties from an incident shall be estimated by counting each property from the best available database taking account of pressure data where relevant

- Where connected properties are in multiple occupancy, each separately billed or occupied part shall be counted as one connected property

- Connected premises currently unoccupied shall be included

12.2.2 Repeat interruptions

Hunter Water must ensure that in any report year, the number of properties where the time since the last planned or unplanned interruption was ≤ 26 weeks does not exceed [33000] properties [28].

Reporting protocols should be designed to achieve accuracy better than ±5% with 95% confidence limits.

The following definitions apply:

- A report year commences on 1 July each year and concludes on 30 June the following year.
- A reportable property is one affected by a shut off of water of any duration, planned or unplanned
- Shut off means a total loss of water supply and begins at the earliest of Hunter Water being notified of an interruption or when valve isolation commences or, in the case of a planned shut off, at the time specified in the notice
- Planned means notice has been given in accordance with the customer contract and the terms of the notice adhered to
- A shut off ends when normal supply is restored
- Exclude shut offs at single properties caused by meter malfunctions or difficulties in the customers own pipework
- The number of reportable properties from an incident shall be estimated by counting each property from the best available database taking account of pressure data where relevant
- Where connected properties are in multiple occupancy, each separately billed or occupied part shall be counted as one connected property
- Connected premises currently unoccupied shall be included

[28] the target should be 35000 properties if this is applied as an Option B licence standard

12.2.3 Sewerage service

12.2.4 Uncontrolled dry weather overflows

Hunter Water must ensure that in any report year, the number of uncontrolled dry weather sewage overflows, excluding directed sewage overflows, does not exceed [5300] events [29].

Reporting protocols should be designed to achieve accuracy better than ±5% with 95% confidence limits

The following definitions apply:

- A report year commences on 1 July each year and concludes on 30 June the following year.
- Uncontrolled sewage overflow means an overflow from any part of the reticulation system that is not a directed sewage overflow.
- Directed sewage overflow means an overflow from a directed overflow structure.
- Directed overflow structure means a designed structure (excluding access chambers) in the reticulation system which operates as a relief to allow sewage to discharge at a planned location or a sewage pumping station
- Only dry weather uncontrolled sewage overflows that are notified to Hunter Water, identified by its employees or Hunter Water's own systems are to be included.
- Uncontrolled sewage overflows during wet weather are excluded.
- Each uncontrolled sewage overflow incident shall be a reportable regardless of whether the overflow affects private land, public land or both
- Each uncontrolled sewage overflow incident shall be counted regardless of whether the public or private property affected has been previously affected by a sewage overflow during the report year

[29] the target should be 5600 properties if this is applied as an Option B licence standard

12.2.5 Repeat uncontrolled dry weather overflows

Hunter Water must ensure that in any report year, the number of uncontrolled dry weather sewage overflow incidents, excluding directed overflows, affecting public land or private property, where the time since the last overflow at the same location was ≤ 1 year does not exceed [1500] locations [30]

Reporting protocols should be designed to achieve accuracy better than ±5% with 95% confidence limits

The following definitions apply:

- A report year commences on 1 July each year and concludes on 30 June the following year.
- Uncontrolled sewage overflow means an overflow from any part of the reticulation system that is not a directed sewage overflow.
- Directed sewage overflow means an overflow from a directed overflow structure.
- Directed overflow structure means a designed structure (excluding access chambers) in the reticulation system which operates as a relief to allow sewage to discharge at a planned location or a sewage pumping station
- Only dry weather uncontrolled sewage overflows that are notified to Hunter Water, identified by its employees or Hunter Water's own systems are to be included.
- Uncontrolled sewage overflows during wet weather are excluded.
- each uncontrolled sewage overflow incident shall be a reportable regardless of whether the overflow affects private land, public land or both
- each uncontrolled sewage overflow incident shall be counted regardless of whether the public or private property affected has been previously affected by a sewage overflow during the report year

[30] the target should be 1600 properties if this is applied as an Option B licence standard

- Where private property is affected, same location means that the same private property or properties are affected

- Where only public land is involved, same location means at the same manhole or the same length of sewer between manholes

13 Appendix D – Key Indicators

13.1 Supply and demand balance

13.1.1 Water balance

Indicator	***Definition*** [31]
Water balance (Ml pa):	
Billed water exported	Water sold to another water business
Billed metered consumption	Water billed to customers based on meter or estimated meter readings
Billed unmetered consumption	Water billed to unmetered customers
Unbilled metered consumption	Consumption through customer meters not billed to customers
Unbilled unmetered consumption	Water taken legally for operational use, fire fighting etc
Unauthorised consumption	Water taken illegally from system
Customer metering inaccuracies	Statistical adjustment to billed metered consumption to allow for demonstrated meter inaccuracy
Real losses	Authorised consumption less apparent losses
Bottom up assessment of water losses (Ml pa)	Total leakage derived from actual measurements and estimates of leakage from different causes and elements of the system
Storage reservoirs	
Mains and service connections	
Total	

[31] We expect these to be consistent with the WSAA definitions but have been unable to obtain a copy to check.

13.1.2 Demand analysis

Analysis of metered demand by customer type:	The definitions in section 12.1.1 above apply as appropriate
base consumption	
growth	
actual consumption	
correction for climate	For residential sector only
savings achieved	= base + growth – actual ± climate correction [32]
reused water supplied	
and by customer sector:	
residential house	
residential flat	
residential other	
non residential domestic only	
non residential cyclical wet	Cyclical, non cyclical, wet and dry are to
non residential cyclical dry	be defined by Hunter Water in its
non residential non cyclical wet	reporting protocol based on the standard
non residential non cyclical dry	industrial classification system
large customers	

[32] For large customers, savings achieved to be demonstrated by individual report and growth = actual - base - savings

13.2 Water service

13.2.1 Water service interruptions

Indicator	*Definition*
Properties affected by interruptions by type Planned and warned Unplanned Third party damage Power failure	The definitions in section 12.2.2 above apply as appropriate
Properties affected by unplanned water interruptions by time band <1 hour >1 hour but ≤ 5 hours >5hours but ≤ 12 hours >12hours but ≤ 24 hours >24hours	The definitions in section 12.2.1 above apply as appropriate
Properties affected by planned interruptions by time band <1 hour >1 hour but ≤ 5 hours >5hours but ≤ 12 hours >12hours but ≤ 24 hours >24hours	The definitions in section 12.2.1 above apply as appropriate
Interruptions affecting a single property Planned and warned Unplanned	The definitions in section 12.2.1 above apply as appropriate
Properties with repeat interruptions by type Planned and warned Unplanned Third party damage Power failure	The definitions in section 12.2.2 above apply as appropriate

13.2.2 Water service pressure

Indicator	***Definition***
Properties receiving low pressure as a consequence of abnormal system operation: <15 metres <20 metres	The definitions in section 11.2.1 apply as appropriate Include properties affected by operational problems for more than 4 days Exclude properties affected by system capability problems
Properties with multiple occurrences of pressure, below <15 metres <20 metres	The definitions in section 11.2.1 apply as appropriate Include any property affected for a period exceeding 15 minutes per 1 calendar day as a result of system capability deficiencies or affected for a period exceeding 4 days as a result of abnormal operations

13.3 Sewerage service

13.3.1 Adequacy of sewerage service

Indicator	***Definition***
Number of private properties affected by sewage overflows by: Wet weather events Dry weather	The definitions in section 11.3.2 above apply as appropriate
Number of uncontrolled dry weather overflows by cause: Main blockage Branch blockage Third party damage Hydraulic overload and other causes	The definitions in section 12.2.4 above apply as appropriate
Number of repeat dry weather uncontrolled overflows events by affected property Private property only Public property only Public and private property	The definitions in section 12.2.5 above apply as appropriate
Response times to priority 1 sewage overflows Number <1 hours Number >1 hours	A priority 1 sewage emergency is a break, collapse, blockage or overloading of the sewerage system leading to: Risk of personal injury or to health Dry weather overflow Wet weather overflow caused by loss of sewer capacity Overflow inside a building Major damage or environmental impact Sewer service interruption

Response times to priority 2 sewage overflows Number <3 hours Number >3 hours	A priority 2 sewage urgent job is a cracked pipe or partial blockage of the sewerage system leading to: Surcharges without heath risk Minor property damage Minor environmental impact including odour

13.3.2 Environmental performance of sewage transport system

Indicator	***Definition***
Total PRP actions due for completion by the year end	As defined by the relevant Environment Protection Licence
Total PRP actions due for completion by year end that are completed before year end	As defined by the relevant Environment Protection Licence
Total number of breaches of licence consent conditions	As defined by the relevant Environment Protection Licence
Total breaches of licence consent conditions involving breach of quality or quantity conditions	As defined by the relevant Environment Protection Licence
Total dry weather overflow events from sewage pumping stations and other such facilities	As defined by the relevant Environment Protection Licence
Volume spilt in dry weather overflow events from sewage pumping stations and other such facilities	As defined by the relevant Environment Protection Licence
Total number of catchment overflow events from designed overflow points during wet weather	As defined by the relevant Environment Protection Licence
Volume spilt in catchment overflow events from designed overflow points during wet weather	As defined by the relevant Environment Protection Licence

13.3.3 Environmental performance of sewage treatment system

Sewage Treatment	
Total PRP actions due for completion by the year end	As defined by the relevant Environment Protection Licence
Total PRP actions due for completion by year end that are completed before year end	As defined by the relevant Environment Protection Licence
Total number of breaches of licence consent conditions	As defined by the relevant Environment Protection Licence
Total breaches of licence consent conditions involving breach of quality or quantity conditions	As defined by the relevant Environment Protection Licence
Volume of sewage, per annum, by-passing all or part of the normal treatment facilities	As defined by the relevant Environment Protection Licence

13.4 Customer service

13.4.1 Complaints indicator

Time to provide a substantive response to complaints by time band:

- Percentage less than two days
- Percentage less than five days
- Percentage less than ten days

13.4.2 Definitions

(a) General definitions

A complaint is any communication received from a consumer or representative of a consumer which expresses dissatisfaction with a product or service or disservice of Hunter Water or its representative that relates to its obligations as set out in the Hunter Water Act 1991 or its Operating Licence.

Hunter Water is not required to make judgements on whether the complaint is justified

A communication can be in any medium including face to face, telephone, letter, fax or electronic mail

Dissatisfaction includes any element of dissatisfaction whether mildly termed or in Hunter Water's opinion unjustified

A complaint received from a customer representative, such as a solicitor; local MP or the Energy and Water Ombudsman should be included as a complaint

Hunter Water's representative includes its own employees and any one employed by another body working on behalf of Hunter Water, for example a contractor

Where a further communication from the customer or his representative is received actively chasing the complaint, this shall be logged as a separate complaint, although one providing or requesting further information is not to be recorded as a complaint

A letter or telephone call advising of a problem (e.g. burst main) does not necessarily constitute a complaint unless it expresses dissatisfaction with the business.

(b) Definition of a substantive response

A substantive response one that addresses the issues raised by the customer and:

- Resolves them to the customer's satisfaction, or provides explanation of the relevant policy and explains why no further action is required; or
- Provides a date when the issue will be resolved if the complaint is relating to future planned operational or capital works

A part response is not a substantive response. (For example, it may be provided to advise the customer that further investigation is required before it is able to provide a substantive response) The response time should be reported from when the proposed action has been completed, except where the response relates to future planned operational or capital works.

(c) Other requirements

If a complaint necessitates a number of contacts by the customer, each contact is to be dealt with as a separate complaint and logged accordingly, unless the subsequent contact only requests or provides further information

Response times should be calculated using working days where date of receipt is day 0 and weekends and public holidays are not included. A part response should not be recorded as a response

Where Hunter Water responds to a written complaint by telephone call or visit then the date of the telephone call or visit must be recorded as the date of response.

Hunter Water may exclude complaints that are:

- Anonymous
- Not about its core activities as expressed in the operating licence or the Hunter Water Act 1991

- Sent in response to or alongside invitations for feedback from Hunter Water, i.e. in response to customer surveys.

13.4.3 Telephone call indicators

(a) Percentage of telephone calls received by a permanent primary advertised number that are answered:

Within 15 seconds

Within 30 seconds

(b) Total time when all incoming lines are busy and callers receive the busy tone

(c) Total number of calls abandoned

13.4.4 Definitions

(a) general

- A primary permanent advertised number is one which Hunter Water advertises to its customer base for use in contacting Hunter Water
- Only include telephone calls received during the advertised hours for the relevant permanent primary advertised number
- Calls to automated bill payment telephone number are excluded

(b) Calls answered and response times:

- A call is received once the caller hears the first ring tone
- A call is answered once an agent answers the call
- An agent is a person engaged by the business to answer telephone calls to one of the principal primary advertised numbers
- For avoidance of doubt, an agent does not include any pre-recorded or voice synthesiser message
- Response times should be calculated from when the caller hears the first ring tone to the point the caller speaks to an agent.

(c) special circumstances

Where Hunter Water uses alternative methods of answering a call the following points should be considered as times when the call is considered answered Hunter Water and response times should be calculated accordingly;

- Interactive Voice Response units and touch tone telephone - from the time of the first ring tone to the point the customer speaks to an agent
- Answer phone messages – from the time of the first ring tone up to the point the message has completed its run, and asks customer to leave their details
- Recorded message - where a recorded message is used to advise customers of a particular incident, the response time is to be considered from the point the customer hears the first ring (or the message begins, whichever is first) to the point the message has run for at least 20 seconds or has completed, whichever is first.

Hunter Water may exclude calls that are:

- Not made from the primary customer base, such as suppliers of the business, Hunter Water contractors etc, using the primary contact numbers
- To a temporary contact point, for example one specifically set up to deal with flooding incidents.

(d) All lines busy

Record the cumulative total elapsed time in minutes during the report period when all lines available for incoming calls are in use such that callers on the primary contact numbers receive a busy tone.

(e) Calls abandoned

Number of calls received where the customer hangs up before the agent answers the call, or before the call is considered answered where there is an automatic system.

13.4.5 Affordability indicators

(a) Number of disconnections

(b) Number of flow restrictions

(c) Number of debt recovery actions

(d) Number of customers assisted though payment support

13.4.6 Definitions

(a) disconnection

A disconnection is defined as the point where the customer's water supply is completely cut by Hunter Water due to the non-payment of a bill.

(b) Flow restriction

A flow restriction is defined as Hunter Water's direct intervention in the supply system in order to reduce flow to a customer's property in response to the non payment of a bill

(c) Debt recovery action

A debt recovery action is defined as when a summons is issued by or on behalf of Hunter Water for non payment of a service account

(d) Payment support

Payment support means the acceptance by Hunter Water of some lesser sum than the amount due in full and final settlement of a residential customer account whether by payment voucher or other means.

13.4.7 Metered accounts where meter not read indicator

Percentage of metered accounts receiving a bill not based on an actual meter read during the report year

13.4.8 Definitions

A metered account refers to any account that is billed based on volume

If a property has multiple meters and each metered property receives a separate bill based on a meter read, these should be reported as separate metered accounts for the purposes of this indicator

If a property has multiple meters and a single account is issued due to common ownership, the meters will be treated as separate metered accounts for the purposes of this indicator

13.4.9 Account contact indicator

Time to provide a substantive response to account contacts by time band:

- Percentage less than one day
- Percentage less than five days
- Percentage less than ten days

13.4.10 Definitions

(a) Account contact

An account contact is defined as:

- any communication received from the customer that relates to any aspect of the billing or payment process, and requires a response or action from Hunter Water
- A communication can be in any medium, whether face to face, telephone, written, fax or electronic mail.

(b) Substantive response

A substantive response is considered one that does the following:

- Addresses the issues raised by the customer and resolves them to the customer's satisfaction, or provides explanation of the relevant policy, and explains why in its opinion no further action is required
- If the issue cannot be addressed immediately due to circumstances beyond the control of Hunter Water, the response must provide a clear strategy of action and/or identify when the action will be undertaken
- A part response is not a substantive response. (For example, it may be provided to advise the customer further investigation is required before it is able to provide a substantive response).

(c) Other requirements

- Where a further communication from the customer or his representative is received actively chasing the account contact, this shall be logged as a separate contact

- Response times should be calculated using working days where date of receipt is day 0 and weekends and public holidays are not included. A part response should not be recorded as a response

- Where Hunter Water provides a substantive response to an account contact by telephone call or visit then the date of the telephone call or visit must be recorded as the date of response.

14 Appendix E - Performance standards and indicators elsewhere

14.1 Supply and demand balance

(a) Melbourne

In Melbourne [33] the licensees are required to prepare drought response and emergency response plans for approval. In the case of drought or an emergency, water use may be restricted or prohibited in accordance with a schedule of general water restrictions contained in the approved plans. The licensees submit data to the Office of the Regulator General indicating the number of days over which general water restrictions due to water shortage have been applied. Water in store in the reservoirs over the past three years and unaccounted for water are used as indicators.

Even though there is no immediate water crisis in Melbourne, the recent four year drought has resulted in the establishment of a Water Resources Strategy Committee. The aim is to stimulate community debate about the issues, the possibilities for the future and sustainable management of water resources over the long term [34].

(b) Perth

The licence issued to the Water Corporation of Western Australia [35] requires it to ensure that during conditions that necessitate restrictions on water use, including drought, sufficient water will be available to meet essential in-house demand.

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[33] Melbourne's Retail Water And Sewerage Companies – Performance Report; July1999 - June 2000; Office of the Regulator-General, Victoria; February 2001: http://www.reggen.vic.gov.au/water_10.htm

[34] Planning for the future of our water resources; Water Resources Strategy for the Melbourne Area Committee; June 2001 http://www.watersmart.vic.gov.au

[35] Water Services Co-ordination Act 1995; Operating Licence; Water Corporation of Western Australia; 15 July 1999: http://www.wrc.wa.gov.au/owr/industry/servprov.htm#link28

(c) Auckland

Watercare, the wholesaler in Auckland, New Zealand, has a requirement that "The construction and operation of the water supply system shall be such that it will be able to meet (without restrictions) normal water demand 99.5% of the time." It is further stated by way of explanation that this is sometimes referred to as a 1 in 200 year drought security standard [36].

(d) UK (England and Wales)

The UK water regulator, the Office of Water Services (Ofwat) has monitored two indicators that relate to reliability of water resources:

- The first standard known as DG1 is an assessment of the population within the area of supply whose availability of water is below a reference level determined by the business, usually written in terms of the frequency of imposing various types of restrictions such as hosepipe bans. This standard has proved ineffective and was withdrawn and replaced with a simpler measure of headroom between assessed yield and projected demand. This is not reported annually but used in the context of resource augmentation and price determination.

- The second standard known as DG4 measures the percent population with demand restrictions during the year, viz., voluntary reductions, hosepipe restrictions, drought orders or standpipe supplies. Indicators of leakage and demand management supplement this standard

(e) France

In France, the municipality that owns the water assets lets a long term concession to operate and develop the system. The concessionaires operate under a punitive regime for water supply restrictions through which, in addition to losing revenues, suppliers are penalised on the product of a prescribed charge on a flow rate and hours affected for each of the customer within the restricted area.

[36] Watercare Annual Report 2000: http://www.watercare.co.nz/annual.html

14.2 Water service

14.2.1 Continuity of water supply

(a) Perth

The Water Corporation of Western Australia's licence [37] requires it to:

- Make every endeavour to ensure that over each 12 month period at least 75% of connected properties in the metropolitan and country urban areas shall not experience a complete interruption of supply (no flow), exceeding 1 hour, to the supply standard set out
- In addition, no connected properties shall experience more than three interruptions which exceed 1 hour each in any 1 year Compliance with this requirement may be monitored by using complaints data.

(b) Melbourne

The three Melbourne water retailers have a system performance standard that regulates the proportion of unplanned water supply interruptions from any cause over a 12 month period that are not restored within 5 hours. A performance target of 95% applies to South East and Yarra Valley but City West's target is 92.5% reflecting its different asset base and environment. The standard is incident rather than property based. Additional key indicators are:

- The average frequency of interruptions (interruptions per 100km of main)
- % interruptions restored within 5 hours (planned and unplanned)
- The average duration of customer interruptions
- Average customer minutes off supply
- Average response times.

[37] http://www.wrc.wa.gov.au/owr/industry/servprov.htm#link28

(c) Adelaide

In South Australia, interruption events are categorised according to severity. For the highest category, at least 99% have to be restored within 5 hours and 100% within 12 hours. Overall, at least 80% have to be restored within 5 hours and 100% within 24 hours.

(d) UK (England and Wales)

In the UK, Ofwat [38] requires companies to report interruptions against a matrix of duration, greater than 3, 6, 12 and 24 hours and cause, either planned, unplanned, caused by third parties or overruns of planned events. All such data is considered as part of the system performance indicator known as DG3.

14.2.2 Adequacy of water supply

(a) UK (England and Wales)

In the UK, Ofwat [39] has adopted a balance sheet approach. The starting point is the total number of properties at the beginning of a year that have previously received and are likely to continue to receive a pressure of less than 10 metres head at the boundary of the property [40] (or a flow of less than 9 litres per minute at 10 metres head). During the year, properties are added to the "at risk" register where better information emerges or where asset deterioration or operational change leads to lower pressure; "one off" events may be excluded. Similarly properties may be removed from the "at risk" register due to better information or where investment or operational changes lead to higher pressure. The net figure on the register at the year end is carried forward to the following year.

In practice, companies normally adopt a higher pressure in the main, typically 15 metres, as a surrogate for the defined requirement. Pressure control has been applied extensively to reduce leakage but at the same time, establishment of discrete pressure zones has been accompanied by better pressure performance against this standard.

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[38] June return reporting requirements and definitions manual 2001; Ofwat; December 2000

[39] June return reporting requirements and definitions manual 2001; Ofwat; December 2000

[40] In the UK, the water company owns the service pipe in the highway

(b) Melbourne

There are no drivers or indicators of water pressure applicable to the three Melbourne water retailers and it is left to them to determine applicable standards. For example, Yarra Valley Water's customer contract obliges it to provide a minimum flow rate dependent on the size of the property service pipe, the minimum being 20 litres/minute at the water meter but with exclusion for peak summer demands and other exceptional circumstances.

(c) Perth

The Water Corporation of Western Australia licence [41] includes the following driver for pressure.

- Subject to customers complying with Corporation requirements the Corporation shall ensure that over each 12 month period subsequent to the granting of this Licence at least 99.8% of customers connected to its water systems shall have, at the outlet of the water meter to their property, water pressure and flow as listed in the following table.

Area	Minimum Static pressure (metres of water)	Maximum static pressure (metres of water)	Minimum flow
Perth Metropolitan (except exempt areas	15	100	20 litres per minute
Country Urban Areas (except exempt areas)	13	100	20 litres per minute
Exempt Areas	See paragraph 2.5 – water supply areas exempt from flow and pressure standards		

(d) Adelaide

In South Australia, SA Water has a target pressure and flow of 20 metres head and 27 litres/minute at the customer meter and a minimum of 17 metres head and 20 litres/minute.

[41] http://www.wrc.wa.gov.au/owr/industry/servprov.htm#link28

14.3 Sewerage service

14.3.1 Adequacy of sewerage service

(a) Melbourne

The three Melbourne retailers are required [42] to:

- Restore sewerage services as soon as possible where the interruption is due to a fault in the licensee's system.
- Fully contain at least 90% of significant sewer spills from reticulation and branch sewers (i.e. not including releases from emergency release structures) within 5 hours.
- Minimise damage and inconvenience to customers on whose property a sewage spill occurs, and clean up and disinfect the spill area as quickly as possible. The licensees are also required to meet Victorian Environment Protection Authority requirements with respect to the containment of sewage.

An additional indicator of sewerage performance is frequency of service failure measured as sewer blockages per 100 km of main.

(b) Adelaide

In South Australia, SA Water is required to deliver the following:

- Restoration of full or partial loss of service within various time limits dependent on category,
- Carry out overflow clean up within various time limits dependent in location
- Attend to overflows within various time limits dependent in location.

For example, at least 99% of category 1 incidents of full loss of service are to be restored within 5 hours and the remainder within 12 hours.

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[42] Melbourne's Retail Water & Sewerage Companies; Performance Report; Office of the Regulator-General, Victoria; July1998 - June 1999: http://www.reggen.vic.gov.au/water_10.htm

(c) Perth

The Water Corporation of Western Australia is required by its licence [43] to:

- Ensure that over each 12 month period at least 99.8% of customers will not experience a wastewater overflow on their property which results from any failure of sewerage assets owned or operated by the Corporation.

- Respond to 95% or more of sewer flooding emergencies within two hours of being notified.

(d) UK (England and Wales)

In the UK, Ofwat [44] has an indicator in place, known as DG5, that measures the number of properties affected by internal sewage flooding. Companies report their assessment of the risk of flooding due to sewer capacity under two categories more than once in 10 years and twice in 10 years. Companies also report on sewer flooding incidents in two causal categories – overloaded sewers and other causes (temporary problems). Thus both predictive indicators (i.e. at risk) and retrospective reporting of actual data is required.

While this performance measure is critical to the UK, it is not as appropriate to Hunter Water due to the provision of a surcharge gully and boundary trap before the first internal connection that minimises the incidence of internal flooding.

14.3.2 Environmental performance

(a) Victoria

The Victorian Environment Protection Authority (VEPA) [45] has responsibility for licensing effluent discharges. It operates dual system of works consents and discharge conditions. The VEPA requires applicants for discharge consent to put forward details of the works proposed, the discharge quality to be achieved and the monitoring programme after commissioning. It is up to the applicant to convince

[43] http://www.wrc.wa.gov.au/owr/industry/servprov.htm#link28

[44] June return reporting requirements and definitions manual 2001; Ofwat; December 2000

[45] http://www.epa.vic.gov.au/

the VEPA that the proposal is environmentally acceptable. Having determined an application, it has and uses powers to apply higher standards at any time.

Wet weather overflows from the sewerage system are also regulated by the VEPA. The standard applied is that there should be no wet weather overflows in storms of 1 in 5 year return frequency or less. This standard is being progressively achieved.

(b) UK (England and Wales)

In the UK, most of the environmental information is collected directly by the Environment Agency (EA) from the water companies. This information includes the results of statutory sampling and details of failures. The EA also identifies failures under the bathing water directive sampling regime. There is consultation between the companies and the EA on the reasons for failure and the companies have to present solutions to rectify such failures for the EA's approval.

There are many unsatisfactory sea outfalls and sludge disposal facilities in UK that lead to failure to meet new standards and consequently a major investment programme. Ofwat [46] therefore collects data to track the outputs of investment through indicators of:

- Sewage load in terms of population connected and the biological oxygen demand (BOD) and chemical oxygen demand load in tonnes.
- Sewerage facilities in terms of capacity in tonnes BOD and the number of unsatisfactory sea outfalls.
- Sludge disposal by method including the percentage sludge disposal deemed unsatisfactory.

14.4 Drainage service

(a) Melbourne

In Melbourne, new development is required to be secure from flooding in storms of less than a 1in 100 year return frequency. When carrying out extensions to serve new development, the opportunity is taken to provide additional capacity to extend 1 in 100 year storm protection to neighbouring areas.

[46] June return reporting requirements and definitions manual 2001; Ofwat; December 2000c

(b) UK (England and Wales)

The water industry in the UK is not responsible for collecting storm water from roads etc., this is the responsibility of the relevant highways authority or council. This water usually receives superficial treatment in petrol interceptors and attenuation ponds, before discharge into a watercourse.

The UK water companies have a responsibility for collecting rainwater runoff from property. Most of this water is collected into surface water sewers and discharged directly to watercourses. Some of it is combined with foul sewerage and sent to sewage treatment works, where flows receive full treatment up to the maximum volume allowable in the discharge consent. Most of the older sewerage systems are of this type. Therefore Ofwat's indicator of sewage flooding, known as DG5, by default covers some stormwater and has a 2 in 10 year flooding incident reporting threshold.

The Environment Agency (EA) requires that storm water overflows from foul or combined sewers (known as combined sewer overflows or CSOs) are provided with primary treatment (usually screening) before being discharged either into the watercourse. CSOs that discharge directly to watercourses are licensed by the EA with specific consent conditions.

14.5 Customer service

14.5.1 Complaints

(a) Sydney

Arising from the recent review, Sydney Water is now required to collect data on the percentage of substantive responses to customer complaint that are provided within two, five and ten days.

(b) Melbourne

The three licensees in Melbourne report to the Office of the Regulator General on complaints in five categories; water quality, water supply reliability, sewerage service quality and reliability, affordability and other issues. Indicators of performance are published [47].

[47] Melbourne's retail water and sewerage companies; Performance report July 1999- June 2000; February 2001; http://www.reggen.vic.gov.au

(c) South Australia

Complaints are regulated in South Australia as follows:

- Where a complaint mentions or suggests adverse health consequences South Australia Water will attend to at least 99% within 2 hours and the remainder within 12 hours

- Where a complaint indicates serious consequences to a consumer's business, hospital, school, etc, South Australia Water will attend to at least 95% within 2 hours and the remainder within 12 hours

- For all other cases, the consumer must be contacted within 2 hours to negotiate attendance within 24 hours at least 95% of the time.

(d) Perth

A mandatory customer complaints standard requires the Water Corporation to resolve written complaints within 21 days with a compliance target of 90%. The corporation is also required to report six monthly intervals on all complaints by category and how they were resolved. For those not resolved, categorisation by such further steps as were taken by the complainant is required.

(e) UK (England and Wales)

Written complaints received and the number dealt with in 5, 10, 20 and more than 20 working days are reported. An individual guaranteed standard for customers applies. The total number of telephone complaints is also reportable with effect from 2000/01.

(f) UK (Scotland)

In Scotland, all written complaints are guaranteed to receive a full reply within 20 working days by the three Water Authorities. At present there is no indication of how related information will be collected and published.

14.5.2 Telephone calls

(a) Sydney

Arising from the recent review, Sydney Water is now required to collect data on the percentage of telephone calls received that are answered within 15 seconds and 30 seconds.

(b) Melbourne

In Melbourne, the number of calls received by the emergency telephone lines of the three retailers and number answered within 30 seconds is collected and the percentage published as an indicator of customer service.

Yarra Valley Water's customer contract establishes an obligation on it to answer 90% of all calls within 15 seconds but data on performance is not publicly available.

(c) Perth

There is a mandatory customer service standard for telephone calls that, with effect from 1 July 2001, requires 70% to be answered within 20 seconds with no more than 5% of calls abandoned after 5 seconds, measured on a monthly basis. The standard is relaxed in July and August 2001 to 50% and 10% respectively.

(d) UK (England and Wales)

Telephone calls answered within 15 seconds and 30 seconds times, number of abandoned calls and total time the primary contact numbers were busy are reported and monitored.

14.5.3 Affordability

(a) Sydney

Arising from the recent review, Sydney Water is now required to collect data on:

- The number of disconnections and flow restrictions for non payment,
- Total number of debt recovery actions
- Number and value of payment vouchers utilised.

(b) Melbourne

In Melbourne, the retailers are required to collect data to provide a series of indicators of affordability as follows:

- Utility relief grant applications approved and amount granted
- Restriction for non payment of bills
- Percentage of customers with instalment plans
- Legal actions.

(c) UK (England and Wales)

In the UK, the companies no longer have the power to disconnect for non payment of water bills and restriction is not generally practicable because the majority of household customers are not metered. Confidential data is being gathered on the impact of this policy on bad debt. We believe that while debt has increased, the proactive approach adopted by Companies in terms of debt recovery and management has contained the problem better than some anticipated.

14.5.4 Metered accounts

(a) Sydney

Arising from the recent review, Sydney Water is now required to collect data on the percentage of metered accounts receiving a bill not based on:

- An actual meter read during the report year
- A business meter read for two consecutive years.

(b) UK (England and Wales)

Indicators are published showing the percentage of metered customers who receive at least one bill during the year based on

- A company meter read
- A company or customer meter read (or both).

14.5.5 Account contacts

(a) Sydney

Arising from the recent review, Sydney Water is now required to collect data on the percentage of substantive response to account contacts provided in:

- Less than one day
- Less than five days
- Less than ten days.

(b) Yarra Valley Water

Yarra Valley Water has an obligation in its customer contract to written enquiries within four days of receipt, either by telephone, or if requested, in writing. No guarantee is given and no performance indicators are published.

(c) UK (England and Wales)

Data on total written and telephone billing contacts received and the number dealt with in 5, 10, 20 and more than 20 working days is gathered and indicators are published. An individual guaranteed standard is also given for written account contacts.

15 Appendix F – Supply and demand balance

15.1 Supply side factors

Hunter Water has three principle sources of water:

- The Grahamstown Dam that is filled partly by pumping from the Williams River when there is sufficient flow in accordance with the licence and quality is acceptable. It provides between 30% and 45% of water supplied.
- The Chichester Dam that impounds an upland catchment providing around 40% of water supplied
- Groundwater from the Tomago Sandbeds that provides between 10% and 30% of water supplied

Used conjunctively, the total yield of multiple resources can exceed the sum of the yield of the sources operated individually, for example by maximising the abstraction from Chichester to minimise the overflow in wet weather. Operating resources for maximum yield or minimum cost may require different strategies.

Rainfall in the Hunter area, as in much of coastal NSW, is more variable than in other parts of Australia. We are given to understand that after depletion of resources to meet peak summer demands, Hunter Water's resources are dependent for recharge on the track taken by residual tropical storms travelling south. The resources are quick reacting; the reservoirs draw down rapidly during the hotter peak demand months in summer and then fill rapidly in autumn. Hunter Water has initiated research to improve understanding of the rainfall patterns in its catchments.

There are significant constraints in the way in which Hunter Water can use its various resources:

- Capacity constraints when treating Tomago water means that that use of Grahamstown water must be maximised to meet summer peak demand
- The Chichester pipeline is a constraint on the volume that can be supplied from this source; the dam spills around half the time
- The Tomago source cannot be turned on and off at will due to problems re-commissioning the wells and pipelines and altering the treatment process.

15.2 Demand side factors

15.2.1 Water balance

The water balance is the foundation for consideration of issues surrounding the supply and demand balance. It is the tool whereby the business can demonstrate that it has robust systems in place and account for all water that is put into supply.

Hunter Water is now able to construct a water balance based on the methodology recommended by WSAA; the following is the water balance for 2000/01.

<table>
<tr><td rowspan="8">Water supplied 76480.0Ml</td><td rowspan="2">Authorised consumption 62066.7Ml</td><td>Billed authorised consumption 61790Ml</td><td>Revenue water 61790.0 Ml</td><td>Billed metered consumption 61790.0</td></tr>
<tr><td>Billed unmetered consumption 0.0Ml</td></tr>
<tr><td rowspan="2">Unbilled authorised consumption 276.7Ml</td><td rowspan="6">Non revenue water 14690.0Ml</td><td rowspan="2">Unbilled metered consumption 0.0Ml</td></tr>
<tr><td rowspan="5">Water losses 14413.4Ml</td></tr>
<tr><td>Apparent losses 3105.0Ml</td><td>Unbilled unmetered consumption 276.7Ml</td></tr>
<tr><td rowspan="3">Real losses 11308.4Ml</td><td>Unauthorised consumption 15.0Ml</td></tr>
<tr><td>Customer metering inaccuracies 3090.0Ml</td></tr>
<tr><td>Real losses [48] 11308.4Ml</td></tr>
</table>

As part of the process of regulating the supply and demand balance, the water balance needs to be reported annually and understood not only by Hunter Water but also by its regulators. The reasons for any trends or step changes should be explored and understood, for example there may be changes in underlying assumptions because of better data.

15.2.2 Real losses

Real losses include leakage from mains, service connections and service reservoirs and sometimes overflows from the reservoirs as well. Reduction of leakage can increase security and defer the need for augmentation of water resources.

It cannot be directly measured but can be estimated two ways:

[48] at storage reservoirs, on mains and on service connections (main to customer meter); i.e. leakage

- A top down assessment in the water balance as the difference between water supplied less billed authorised consumption and minor usage with an adjustment for meter error (11308.4Ml in 2000/01)

- A bottom up assessment by accumulating actual measurements of leakage throughout the system (not calculated).

Good correlation between the top down and bottom up assessments gives a measure of assurance that the reported figures are robust.

The use of percentages in measuring and reporting leakage can be very misleading as it is sensitive to changes in the denominator, commonly water into supply. For example, demand management success with no change in leakage levels would result in apparent increase in leakage expressed as a percentage.

Distribution losses are best expressed either as litres per service connection per day or litres per kilometre of main per day. Where there is a low connection density as at Hunter Water, the latter gives a more favourable comparison. However as we have been told that Australian water businesses are generally adopting litres per connection per day, we recommend the Tribunal should use this as the primary indicator when making comparisons.

Hunter Water has been working to improve its understanding of the water balance and, like most business who embark on this path, has found errors in figures [49] previously reported to the Tribunal. The recent water balance for 2000/01, enables us to calculate Hunter Water's leakage as some 159 litres/property [50] /day. In comparison, leakage at Sydney Water in 1999 was 161 litres/property /day; we are not in a position to comment further on this figure. On the basis of leakage per km of water main, Hunter Water's leakage would be lower than in Sydney because of the lower connection density.

It is not practical to achieve zero leakage in a water system. As leakage reduction activity is increased, there are diminishing returns in terms of water saved. It is possible to calculate an economic level of leakage, i.e. when the value of water lost equals the cost of leakage activity. The value of water saved could include a component for the social and environmental costs.

[49] Hunter Water AIR; 17Nov 99

[50] We have used "property" because "connection" data is not available in the AIR

Absolute leakage rate is less significant than the gap between leakage and the economic level of leakage that Hunter Water has not yet quantified. Assumptions are necessary in order to calculate the economic level of leakage, for example the reductions that will be achieved by applying new techniques.

From our discussions, we believe that Hunter Water is making progress towards a first estimate of the economic level of leakage.

15.2.3 Residential demand management

Residential water consumption at Hunter Water is illustrated below:

	Year ending 30 June (litres/day)							
	1993	1994	1995	1996	1997	1998	1999	2000
Per person	195	204	195	193	216	229	206	209
Per property	527	549	521	493	541	574	531	532

Because of revenue meter errors found while constructing the water balance, these figures are underestimated by around 5%.

In comparison, Sydney Water residential water consumption in 1999 was reported as 232 litres/person per day or 639 litres/property/day. It has been suggested to us that these figures may need upward adjustment to reflect meter inaccuracy.

We note from the Operational Audit 2001 [51] that Hunter Water does not have the ability to estimate the impact of climate on demand making interpretation of the above figures difficult. The auditors also found that whereas Hunter Water has prepared and submitted a demand management strategy to DLWC, demand predictions do not reflect the water conservation strategy. Hunter Water's demand management strategy is based on holding its current residential water consumption for at least 5 years, largely by price signals, public awareness and education programmes

As with leakage, we believe it practical to calculate an optimum level of demand reduction activity, i.e. when the cost of reducing demand further equates to the value of water saved. The value of water saved could include a component for the

[51] 2001/01 Operational Audit of the Hunter Water Corporation; Hyder Consulting; Draft 17 September 2001

social and environmental costs. As with leakage, the important performance measure is the gap between the economic and actual level of demand.

15.2.4 Industrial demand management

The Hunter is an industrialised area with many businesses using water for process purposes; it is important that demand management principles be applied to this group as well. Such customers are normally more responsive to pricing signals than residential customers but may not have focussed on controlling water costs where it is not a major part of the budget.

Hunter Water's strategy as set out in its demand management plan is to employ cost reflective pricing coupled with promoting awareness of water efficient technology to customers. It also told us that it relied on conservation specialists who actively promote the cost benefits of water saving on a commercial basis.

Where non residential customers use water for domestic purposes only, they can be considered similarly to residential customers. Establishing optimal demand management targets will be more complex for other non residential customers. Nevertheless with an understanding of how and why these businesses use water, we suggest that specific strategies and targets could be developed for different customer groups.

15.2.5 Wastewater reuse

Hunter Water supplies around 4850 Ml p.a. of effluent for reuse, some 10 % of the dry weather flow.

Location	Volume reused 2000/01 (Ml)
Industrial use	2875
Direct irrigation	420
Indirect irrigation [52]	1550
Total	6845

[52] abstraction from rivers supported by WWTW effluent discharges

For the purposes of the management of the supply and demand balance, reuse for irrigation purposes is not relevant except where existing mains water is replaced by effluent. There will be other advantages and disadvantages in the application of effluent to land rather than disposal to water.

For water reuse, there will be a break even point for each potential user that can be calculated; apart from large users, reuse is only viable where there is a source of treated effluent nearby. However the inclusion of environmental and social costs would alter the balance in favour of reuse. Each reuse opportunity should be considered on its merits and adopted where economic.

15.3 Options for regulating supply and demand

15.3.1 Demand management regulation

Demand management can be made the key element for regulation. Mandatory targets for leakage, demand management and reuse [53] are determined and security of supply becomes the outcome of the system and is not regulated directly. This is the method currently applied to Sydney Water.

The advantage of this approach is that it obviates the need for making difficult decisions on resource augmentation until security of supply is judged unacceptable. The danger is that it may take a serious drought to demonstrate that security is unacceptable and, with long lead times for a new resource, take time to remedy.

15.3.2 Security of supply regulation

Security of supply can be made the key element for regulation. This method usually results in greater pressure for resource augmentation where risk is often perceived to be less than for demand side management.

This is the method currently used at Hunter Water although the existing system performance standard for security of supply is incomplete in that it refers only to the probability of entering a drought, not the duration of restrictions. This could be remedied but if a more transparent means of referring to security of supply is developed at Sydney Water and Sydney Catchment Authority, then it might have application at Hunter Water as well

[53] or a single target for total environmental abstraction as at Sydney Water

15.3.3 Use of an economic instrument

An economic instrument would determine the social value to customers of unrestricted water supply and then apply this as a rebate in the event of mandatory restrictions.

The advantage of this mechanism is that it is an integrated solution that leaves the utility to determine the optimum policy of resource augmentation and demand management without constraint and therefore should achieve the most economic solution.

The disadvantages in the case of Hunter Water are its tariff structure with low fixed charge and high usage charge to promote efficient use of water. It is probable that the social cost of restrictions would exceed the fixed charge at its current level. To give a rebate in excess of the fixed element would send the wrong signal to customers in the event of drought when the importance of maximum efficiency is greatest. Hunter Water's current drought management strategy envisages the use of higher volumetric charges as a price signal to customers that would also protect the commercial viability of the business.

15.3.4 Security of supply plan and water conservation strategy

Hunter Water has argued that the existing standard should be deleted. It proposes instead to prepare a 10 year security of supply plan to be rolled forward every five years on which it would report to the Tribunal as part of the price determination process. Separate consideration would be given to a demand management strategy incorporating a water conservation strategy on which it would report to the Department of Land and water Conservation (DLWC) and the resulting savings reflected in the security of supply plan. Leakage would be considered separately through indicators only. Reuse would be subject to "stretch targets" without penalty for failure in the environment plan.

A range of indicators of adequacy of water resources would be reported in the environment report and considered together with indicators of progress on demand side management in determining the need for resource augmentation.

The advantage of this approach is that it would give maximum flexibility to deal with difficult resource management issues. The disadvantages include:

- Separate consideration of components could lead to poor decision making
- No overall co-ordination of regulation to ensure consistency

- Little incentive to achieve an optimum solution either overall or in the elements.

15.3.5 Least cost management

Least cost water balance management develops the water plan principle suggested by Hunter Water such that appropriate targets are derived as part of the process. Hunter Water's supplementary submission accepts the principle of least cost planning

Least cost water balance management would involve integrated resource planning incorporating least cost planning to evaluate the costs and benefits of a range of means of meeting water customers' demand for water related services within an economic decision making framework [54]. Demand, resource yield and security of supply need to be considered as equal and interdependent components.

The advantage is that it seeks to achieve the optimum overall economic solution but to apply the technique requires understanding of the water balance and cost effectiveness of alternative policy options.

It would be an iterative process, developing the methodology and refining the assumptions to reflect actual data. Significant assumptions will be required initially and refined later as better data becomes available. For example, the economic level of leakage depends on assumption of the reductions that will be achieved by applying new techniques; when actual local data is available, then the model can be refined.

[54] National Working Group on Water Conservation; Discussion paper – regulating for economic water efficiency; Stuart White; Institute for Sustainable Futures; May 1998