

13. FUTURE DIRECTIONS

13.1 Overview

This study has examined a widely range of issues relating to the demand side of water supply in typical Queensland communities. A rigorous approach to demand side planning was undertaken to identify common issues and to identify the benefits of the implementation of water efficiency programs on a state wide basis. Assessment of the opportunities for water efficiency and conservation available to Queensland communities indicates that there are significant benefits in implementing an integrated approach to planning of water supplies.

This section of the report summarises the common approach and opportunities identified during the study.

13.2 Least Cost Planning

The aim of Least Cost Planning or Integrated Resource Planning is to identify an appropriate balance between system operation / capacity expansion costs and the savings associated with programs aimed at increasing the efficiency of water use. The procedure to undertake such a study should involve the following steps:



Least Cost Planning should take into account the entire water supply management process and involve the community in the planning and implementation process to ensure success. Issues such as water pricing approaches, water efficiency measures and



incentives, leakage assessment and the adoption of regulations to assist implementation need to be addressed in any adopted plan. Water efficiency plans need also to consider the monitoring and feedback of results to the community.

The results of the Least Cost Planning analysis undertaken during this study indicate that cost effective, active water efficiency programs were developed for four of the five communities studied. Substantial benefits may be realised by the water supply authority, the customer and the community as a whole.

Co-sponsoring of water efficiency initiatives needs to be developed to take advantage of associated reductions in energy and other consumables during program development. This is particularly important in the non-residential sector.

It is recommended that the Least Cost Planning process be implemented on a state wide basis following the completion of field trials to confirm the results of the study.

13.3 Demand Analysis

To successfully undertake Least Cost Planning it is essential to ensure that water demand is analysed and forecast using a rigorous approach. The approach adopted in this study was to develop a monthly time series model which was used to identify the climate normalised demand and the impacts of pricing changes, demand management initiatives, restrictions and other variables on the bulk water demand. The ability to disaggregate water usage to main customer categories would be a major advantage for this process.

The demand model should be used as the basis for demand forecasting as this will provide an accurate long term demand benchmark for the Least Cost Planning process.

It is also important to take into account the natural changes in water demand that are occurring without assistance in the form of water efficiency initiatives. These include the installation of dual flush toilets, water efficient showers and urinals and the reduction in lot sizes and irrigation areas in residential developments. The natural conservation issues are taken into account in the DSS forecast of baseline demand.

To enable the accurate analysis of the cost effectiveness of water efficiency initiatives it is essential that Queensland water authorities improve the data available from water billing databases. It was found during this study that there is a wide range of capabilities and data availability in this area. A customer category / land use system is required for the water industry to enable data to be made available for the major water using groups. It is recommended that all systems be upgraded to be capable of high level reporting for standard overall categories. The make of the land uses in the level below the overall reporting level could be left to the discretion of the authority.

13.4 Water Pricing

The study found that the adoption of user pays in various forms has resulted in water use reductions of up to 22% in four of the five authorities. This performance was determined from demand modelling and must be considered on the basis that other undefined impacts were occurring during the implementation period. It is believed that the use of a fixed charge with either a single or two block pricing structure is the best approach to water pricing. The challenge from a water conservation viewpoint is to set the fixed price as low as possible to provide the customer with the highest level of discretion over water costs.

In addition, billing practices require to be improved to inform the customer of performance and variations from normal usage. Billing for water charging should be using the example of the energy industry and providing additional data and conservation messages.

13.5 Regulations

Regulations offer the community the chance to implement change at low cost compared to those measures that require rebates and other incentives. The review of regulations undertaken in this study indicates that local regulations are best aimed at uses of water such as landscaping, retrofitting and restrictions. National Regulations are preferable for plumbing fixtures such as showerheads. The time taken to develop national regulations is up to five years.

Due to the lead time required to develop regulations on such items as showerheads the implementation of regulations at a local level may be applicable. If local regulations are implemented for plumbing fixtures it is necessary as part of the National Competition Policy to be able to clearly demonstrate the public benefit and to ensure that the action is not anti-competitive. The advice of a Trade Practices / Competition Policy lawyer should be sought prior to adopting such a regulation.

13.6 System Leakage

The analysis of UFW and leakage levels of the five pilot areas has shown that active leakage management programs have not been implemented in any of the systems. All authorities were capable of determining leakage using the Integrated Flow Method however the accuracy or split between leakage and un-metered supply was not known. The level of UFW ranged from 12 to 20% of total production with the possibility that the Mackay level was even higher due to an old and unreliable meter fleet. Leakage was estimated at 75% of UFW levels for the purposes of the report.

Based on the analysis of the feasibility of implementing active leakage reduction programs it was found that programs would be beneficial in Mackay and Emerald. The low apparent levels of leakage in Toowoomba and Maroochy indicate that system wide implementation would not be feasible, however the adoption of a zonal assessment program together with the leakage reduction on a priority basis would be worthwhile.



It is recommended that the use of the Integrated Flow Method of calculating and reporting leakage be replaced in favour of a system which utilises night flow testing to determine leakage on the basis L/conn/hour or day. This approach minimises the inaccuracies of the Integrated Flow Method and directly determines the leakage rather than estimating a level based on the Unaccounted For Water percentage.

13.7 Trials

Field trials are recommended for the following reasons:

- Improvement of the knowledge base for water savings in the non-residential sector.
- Determination of the market penetration for measures that appear to be cost-effective, but are new to Queensland.
- Review of the cost-effectiveness estimates determined in this study based on data collected in the pilot program.
- Identification of those measures that warrant a full-scale program based on water savings, customer acceptance, and cost-effectiveness.

The scope and scale of the field trials needs to be the subject of specific trial design to take account of such issues as statistical significance and resource requirements. Trials are estimated to cost of the order of \$50,000 for residential and \$25,000 for non-residential, and should be capable of being completed within one year. All trials need to involve a rigorous evaluation phase aimed at confirming the outcomes of this study.

13.8 Queensland Guidelines

Based on the detailed analysis of the potential for Least Cost Planning in Queensland, it is evident that:

- There is substantial benefits in implementing Least Cost Planning in Queensland.
- The approach presented in this report provides a sound basis for the planning water supply systems taking into consideration demand side efficiency improvements.
- Current practice relating to water supply planning in Queensland need to be reviewed.

Changes to the 1989 QDNR publication *Guidelines for Planning and Design of Urban Water Supply Schemes* that should be considered as a result of this study are as follows:

- An outline of the principles of Least Cost Planning and the requirement to consider demand side options as part of the planning process, should be included in the guidelines.



- The requirement for detailed demand analysis should be required to ensure that the historic demand is rigorously evaluated taking into account the impact of climate, pricing and demand management.
- A procedure for the calculation of natural conservation should be included in the guidelines.
- Details of the economic analysis approach for assessing demand side options needs to be included.
- A section on leakage reduction and the methods to be used for assessment of leakage should be included.

Alternatively, a separate guideline on the assessment of demand side options may be developed to assist local governments. Such an approach would include the provision of software to undertake demand analysis and benefit/cost analysis.