

# **WATER and WASTEWATER**

## **RE-USE SESSION**

### **BENEFICIAL RE-USE OF RECLAIMED WASTEWATER - ALBURY'S ELEGANT SOLUTIONS**

*Daryl McGregor, Manager Asset Design Services, Albury City Council*

The Waterview Wastewater Treatment and Re-use Facilities represent an elegant solution developed by Albury City Council for the future management of the City's Wastewater stream.

The Strategy incorporates:-

- Advanced wastewater treatment utilising BNR processes, UV disinfection and sand filtration.
- Beneficial re-use of the reclaimed water involving summer irrigation of commercial woodlots, lucerne irrigation and winter discharge to a rehabilitated, riverine wetland.
- Development of the Wonga Wetlands as an ecological resource for the region and a potential eco-tourism destination.
- Future irrigation of local parks and recreation areas.
- On-going development of commercial irrigation opportunities.

The facilities came fully on line in April 1999 at a total cost of just over \$33 million.

This Paper discusses the processes that were followed in initial development of the Project (including the most extensive public consultation ever undertaken by a local government authority); as well as significant elements of the Project and subsequent commissioning of the various facilities.

## **EFFLUENT RE-USE IN THE USA**

***Michael Bryant, Tamworth City Council***

Michael Bryant received a NSW Municipal Engineering Foundation Endowment to undertake a study tour within the United States of America to investigate large-scale effluent reuse schemes to gain knowledge and best practice which may be applicable to the Australian environment.

The tour involved inspection of large scale public and private sector effluent reuse irrigation schemes within rural USA, focusing on scheme design, construction, operation, equipment components, management options, financial viability, difficulties, risk management, plus opportunities for partnering (coexistence) of reuse schemes with intensive agriculture and industry.

The study tour has provided valuable information and experience, which may be drawn on in the design, construction and operation of large-scale effluent reuse schemes within Australia.

## **WATER RE-USE IN A DRY LAND – A STUDY IN ISRAEL AND CALIFORNIA**

***Col Earnshaw, Wagga Wagga City Council***

The presentation will give an overview of a recent study tour of effluent irrigated horticulture in Israel & California and look at the applicability of the practices, issues and research seen in these places, to Australia and attempt to give a comparison to the Australian situation.

## **POLICY AND PLANNING SESSION**

### **WSAA CODES AND AUS-SPEC—FRIENDS OR FOES?**

*Michael Hordern, Project Manager, Product & Asset Planning, Distribution, Sydney Water*

*David Cox, National Codes Manager, Water Services Association of Australia*

The Water Services Association of Australia water supply and sewerage Codes address requirements for planning, design and construction of water and sewerage network infrastructure. A salient objective of the WSAA Codes Initiative is to achieve efficiencies through standardisation of products and services in a small and disparate Australian market. The first editions of the WSAA Codes were published in 1999 and major revisions are in hand to produce 2<sup>nd</sup> editions by late 2001. Salient objectives of the revisions are to expand the scope, improve technical content and address compatibility of the Codes with adopting agencies contractual and administrative processes.

The WSAA product appraisal process addresses the conflict of innovation vs standardisation of pipeline products and is closely linked to the Codes Initiative.

Water and sewerage projects are frequently an element of a total development but the WSAA codes do not directly address associated projects such as roadworks, drainage, parks, buildings and other facilities. These are covered by the AUS-SPEC series of contract documents. Given that both sets of standards embrace the concept of facilitating out-sourced development activity it is contended that a synergy exists between the WSAA Codes and AUS-SPEC.

The paper details the status of development of the 2<sup>nd</sup> edition of the WSAA Codes. It aims to generate dialogue between standards writers with the view to closer harmonisation and reducing complexity for stakeholders in infrastructure development.

## **BRIDES HEAD REVISITED 2 - INTEGRATED WATER PLANNING: TAILORED STRATEGIES FOR WATER AND SEWERAGE SYSTEMS**

*John Anderson, Department of Public Works & Services*

Sitting below its distinctive bluff, the coastal village of Brides Head remained unspoilt and not much affected by the 20<sup>th</sup> century. Recently, however, the idyllic views over the river and beaches have been “discovered”, and Brides Head is experiencing a sea change. The rich-and-famous are building elaborate houses among the trees on the upper slopes. The not-so-rich-and-famous are taking up the subdivisions on the lower slopes. The fibro houses of the village are giving way to holiday units and town houses.

The population now exceeds the design population of the water supply and sewerage systems installed in the 1970s. The council is facing major works to cater for the needs of an expanding and more demanding consumer base.

Experience elsewhere has shown how integrated water sewerage and drainage planning can identify alternative solutions and cost savings which are not apparent when separate strategies are prepared for each service. Also, instead of the old “once-size-fits-all” design guidelines, new methods are now available to tailor system designs to local circumstances.

The paper presents technical details of new tailored system design methods which the Council at Brides Head might employ to develop its water and sewerage strategies to meet community needs and reduce costs. The core of the new approach is a method for estimating peak flows in water and sewerage systems. Peak flows can be calculated for any duration, for any type and size of residential development with any combination of household fittings and appliances. This allows system designs to be tailored to suit local circumstances, resulting in lower costs. Savings can also be made in system upgrading and rehabilitation costs.

## **FUNDING FUTURE DEVELOPMENT – A WATER SUPPLY “S.64” CONTRIBUTION PLAN**

***Anne-Maree Burke, Section S64 Project Engineer, Hastings Council  
Murray Thompson, Water Supply Manager, Hastings Council***

The Hastings District Water Supply Augmentation Scheme [HDWS], includes the new Cowarra 10,000ML off-creek storage dam. This project together with other major augmentation works identified to cater for future water supply demands will cost the local community in excess of \$65M.

Hastings Council is currently attempting to implement by July 2001, a new s.64 contribution plan, in order to ensure a sustainable and secure financial future for its water supply business.

The calculation of the new s.64 contributions for the water supply scheme has been completed using the new NSW Department of Land & Water Conservation methodology. The calculations are “net present value” [NPV] based and substantially higher than those previously levied by Hastings Council.

The new calculation methodology involves the creation of Development Servicing Plans that calculate contributions using a NPV approach. NPV is a standard commercial approach to project evaluation, but is vastly different to that previously used by Hastings Council to set Development Contributions for water supply services.

The rationale of this method is that in the long-term, contributions should move to a level which would cover the capital charge for a development area less the present worth of projected renewal expenditure per property over the next 50 years.

The contribution plan serves two related and important functions. Firstly, the contributions provide a source of funding for infrastructure required by new urban developments. Secondly, the contributions provide a signal regarding the cost of urban developments, encouraging less costly forms and areas of development.

The increased water supply contributions will have impacts upon the local development industry. Ultimately, at least part of this increased contribution will be passed onto the purchaser of the land through higher land prices in the new areas.

The paper to be presented to the IPWEA Conference will outline the detailed investigation, planning, long term financial modelling, community consultation and implementation of the new s.64 contribution plan.

# **PRIVATE SECTOR PARTICIPATION PRACTICE IN AUSTRALIA – AN UPDATE**

*John Davis, Director, IDSM*

*Greg Cashin, Director, Cashin Engineering & Management*

Private sector operation of water & sewage treatment plants has been established in the Australian water industry since 1993; with most of the facilities coming on-line since 1995.

The original focus of comprehensive private sector participation [PSP], now more globally labelled 'Public Partnerships' (or P3 as an acronym) were significant new capital works, specifically treatment plants, in Sydney and Melbourne.

However, the form (of contract) and organisational scale application (more smaller applications) has been diversifying significantly over the last five years. As a result, the nature of P3 contracts, although well recognised generically through acronyms such as 'DBO' and 'BOOT'; are actually not well understood (based on the author's experience in a number of local governments) by the majority of potential users in medium sized water agencies.

The proposed paper will focus on an explanation of the latest trends in P3 contracts, where these trends are emerging, the influences behind the trends, and the possible implications for local governments throughout NSW. The principal focus will be on DBOs, outsourcing and Alliances.

# WATER SESSION

## PROTECTING ENVIRONMENTAL FLOWS IN THE HASTINGS RIVER WHILE CATERING FOR URBAN WATER SUPPLY DEMAND - THE COWARRA OFF-CREEK STORAGE DAM EXPERIENCE

*Murray Thompson, Water Supply Manager, Hastings Council*  
*Geoff Chenhall, Project Engineer, NSW Department of Public Works & Services*

The Hastings District Water Supply Augmentation Scheme [HDWS] includes a 10,000ML off-creek storage dam, which is currently under construction and due for completion in September 2001.

The Cowarra off-creek storage dam is required to meet predicted long term urban growth demands for water supply and to ensure protection of environmental flows in the Hastings River.

Since 1986 the Hastings Council has progressively developed a strategy for the augmentation of the water supply scheme. A very successful ongoing consultation process with both the local community and key government agencies during the planning and implementation phases of this project has highlighted a number of key issues including:

*That the impact upon aquatic flora and fauna in the Hastings River should be minimised and appropriate safeguards developed by maintaining minimum river flows to ensure that the river habitat is not adversely affected.*

The subsequent HDWS Environmental Impact Statement, 1995 was one of the first in NSW to recognise the importance of environmental river flows in the assessment of the aquatic ecological effects of water supply schemes.

The paper to be presented to the IPWEA Conference will detail the investigation, planning, implementation and current construction activities associated with the Cowarra Off-Creek Storage Dam and will highlight features of the project including :

- Successful community and key government agencies consultation process and the formation of local water users associations in conjunction with ANSW Water Reforms Process@.
- Planning and environmental assessment of the project, [Winner of RAPI Excellence in Planning Award, 1995], including demand management initiatives which have resulted in reduced per capita demands.
- A revised river pumping regime which has been developed which minimises the impacts upon fish passage during critical months without comprising the water supply strategy.
- Real-time river flow and water quality monitoring facilities developed to support ongoing assessment of the aquatic environmental and water

supply quality, [Winner of IEA & IMEA Engineering Excellence Awards, 1998].

- Extinguishment of Native Title at the dam site with the co-operation of the Bunyah Local Aboriginal Land Council in exchange for employment and training opportunities during the project.
- Design and construction of the Cowarra Off-Creek Storage Dam.

## **THE WAUCHOPE “LEAKY” TRUNK MAIN – RECTIFICATION WORKS**

***Murray Thompson, Water Supply Manager, Hastings Council***

A tender has been recently been awarded for the replacement of 7.2km of 750mm diameter water supply trunk main which was constructed in 1994, as part of the \$65M Hastings District Water Supply Augmentation Scheme [HDWS].

The decision to replace this trunk main has been made by Hastings Council following a protract legal dispute between the NSW Department of Public Works & Services [DPWS] and the pipe supplier Humes Steelpipe Pty Ltd [HSL] of New Zealand.

In May 1993 the DPWS let a contract for the supply and delivery to Port Macquarie of 7,200 metres of 762mm OD 6mm wall thickness mild steel cement lined pipe with spigot and socket rubber ring joints and “Polyken” external corrosion protection wrapping. However, it was not discovered until much later that HSL had never manufactured a spigot and socket pipe as large as 762mm OD.

The construction of the trunk main was undertaken by a local contractor and completed in late 1994. A number of attempts to hydrostatically test the trunk main found that the buried pipeline was unable to hold test pressure and numerous leaks were detected at the pipe joints.

The paper to be presented to the IPWEA Conference 2001 will detail the history of this project and examine what went wrong with the quality assurance of both supply and construction contracts. The paper will also highlight features of the project including:

- The original decision by the State Government to award this contract to HSL, in an attempt to introduce competition into the market place for the supply of water supply pipes.
- The legal dispute between DPWS and HSL and its impact upon Council's ability to move forward with this project and obtain a functional trunk main, urgently required to meet rapidly increasing water demands.
- Investigations of possible pipeline repair options including external welding of over 900 pipe joints or the installation of internal repair seals.

## **THE GREAT ARTESIAN BASIN (GAB) - BEYOND LOCAL AND STATE BOUNDARIES**

***Jeff Austin, Chairman, NSW GAB Advisory Committee  
Director, Scarabworks Pty. Ltd***

The Chair of the NSW State Committee is responsible for advising the Minister for Land and Water Conservation on all matters pertaining to the waters of the GAB in NSW and to provide a link with Queensland, South Australia and the Northern Territory through the GAB Consultative Council.

The Strategic Management Plan for the GAB was launched in the latter half of 2000 and the NSW Minister signed off on the State Plan in early 2001. The Plans provide the framework for responsible groundwater and related natural resource management in the GAB and implementation of identified necessary changes. The Plans guide governments, water users and other stakeholders on policies, programmes and actions necessary to attain optimum economic, environmental and social benefits from the existence and use of Basin groundwater resources.

The GAB underlies 22% of Australia's land area. The States of New South Wales, South Australia, Queensland, and the Northern Territory manage it.

The GAB is primarily a sedimentary basin comprising a complex multi-layered system of water bearing and non-water bearing strata.

The Plans are the result of increasing concerns for the decline in water pressures and wastage with the competing interests of the pastoral and mining industries, urban communities, and environmental, cultural and heritage issues.

In NSW, the GAB covers approximately 25% of the State and impacts on 14 local council areas. Issues for the councils and the State range from sustainable urban water supply, viability of rural landowner ratepayers, mining and possible restrictions on use for future industry and tourism development.

The paper also addresses both political and implementation options for the management of the GAB over the next fifteen years. Examples of extractive use and processes in place as well as funding options coupled with the Federal Government's \$30M commitment for the whole over the next five years are explained.

## **CATCHMENT MANAGEMENT – A TARGET DRIVEN APPROACH**

***Daryl McGregor, Independent Chair, Murray Catchment Management Board***

Catchment Management across Australia is undergoing a revolution. National, State and regional strategies are being developed to address land, water and biodiversity issues on a large scale. Gone are the days of small, local area, solutions – the Landcare approach simply hasn't worked.

All these strategies will be target driven with clear objectives and monitoring/auditing methodologies build in.

In NSW, 43 local area Catchment Management Committees have been replaced by 18 Boards, all charged with developing a Catchment Plan by September this year.

This paper will discuss the changes to catchment management philosophies and will describe the processes being used to develop Catchment Plans.

The Murray Catchment Strategy will be presented as a case study of developing Salinity, Acid Soil and Biodiversity Targets.