



Executive Summary

This report documents the development of the Muswellbrook Shire Council (MSC) Integrated Water Cycle Management (IWCM) Strategy by MSC. This report has been developed in line with the NSW Department of Water and Energy (DWE, formerly the Department of Energy, Utilities and Sustainability, DEUS) *IWCM Guidelines* (2004). It identifies the process in which the preferred scenario for the future management of urban water services in MSC was chosen and provides guidance for its implementation.

Scenario Building Approach and Data

A range of management options was developed to address the catchment, water resource and urban issues identified by the IWCM Concept Study through the review of background studies and stakeholder consultation. In addition, a series of potential management options were investigated through a series of desktop studies, including a demand analysis and a review of alternative water sources such as stormwater harvesting and effluent reuse.

This process eliminated any potential management options which would not be technically feasible for MSC given the prevailing characteristics and issues.

Once the most feasible options for MSC were identified, complementary options were bundled together to form five scenarios. Each of these scenarios considered water supply, sewerage and stormwater aspects of MSC operations. Detailed capital works programs for each of the scenarios were prepared.

Triple Bottom Line Assessment of Scenarios

A set of assessment criteria was developed in order to assess the ability of each scenario to address the identified issues. The criteria developed allowed each scenario to be ranked based on environmental, social and economic aspects i.e. a triple bottom line (TBL) assessment.

The Preferred Scenario

Each scenario was presented to the Project Reference Group (PRG) and a preferred scenario was identified for implementation. The preferred scenario is summarised in the table below.

Table S-1: Preferred Scenario

No.	IWCM Issue	Strategy	Preferred Scenario
1	The water supply and sewerage systems do not have sufficient capacity to service present needs and growth and are not expected to meet future licence conditions. The use of water resources within the shire is also inefficient due to high unaccounted for water, poor demand management and limited use of alternative water sources to minimise town water use.	Demand Management (Shire-wide)	Pricing, WELS, BASIX, UFW, residential audits, education (WSP 2).
		Water sensitive urban design - self-sufficient water supply (shire-wide)	None.
		Stormwater harvesting	Encourage individual developers/ industry to implement stormwater harvesting.
		Muswellbrook (MBK) WTP upgrade	WTP upgrade to 18.2 ML/d. Quality improvement through treatment process as in 12.
		Additional reservoir	No additional storage required.
		Sewer upgrade	Pumping stations and new trunk mains to fully service growth in East and North Muswellbrook.
		MBK STP upgrade	Secondary treatment (capacity 16,500 EP).





No.	IWCM Issue	Strategy	Preferred Scenario
		Denman (DEN) STP	New plant, secondary treatment (capacity 2,500 EP).
		Sandy Hollow (SH) sewerage system	Provide sewerage to SH and municipal effluent reuse (secondary treatment, capacity 150 EP).
2	There is insufficient renewals planning and investment that may cause operational issues, breach of DECC licence conditions and community service level expectations	Renewals planning	Development of condition based asset management plan.
		Renewals investment	Renewal of mains, reticulation, pumps, reservoirs and bores to meet licence requirement and condition based asset management plan.
3	Effluent reuse must be sustainable within the context of overall government and community strategic directions	Effluent management (MBK)	Continue existing mine reuse and golf course reuse until most beneficial reuse option is determined through an effluent management strategy.
		Effluent management (DEN)	Continue existing golf course reuse until most beneficial reuse option is determined through an effluent management strategy.
		Effluent management (SH)	Municipal effluent reuse with provision of reticulated sewerage.
4	Lack of resources to implement plans	Human Resources Provision	Additional resources required for each new project/program proposed are included in the cost of the respective project/program.
5	Lack of education and assistance for demand management measures may result in increased risk of unsuccessful programs	Education	Education program included in demand management (as in 1).
6	Need to ensure long term water supply security and allocation from Hunter River through appropriate provisions in the Water Sharing Plan	Liaison with CMA and DWE	Liaison with CMA, DWE to ensure water supply is secure through Water Sharing Plan.
7	Denman river extraction limited by existing infrastructure	DEN River extraction	Construction of river intake.
8	Poor water supply quality (turbidity and hardness) at Denman	DEN WTP upgrade	New WTP (with future capacity increase)
9	Increase in per capita outdoor water use due to lower occupancy ratios	Development control planning	Taken into account in MSC provided growth projections.
10	Unknown security and saline supply at Sandy Hollow	Security of supply	No change.
		SH WTP upgrade	Upgrade WTP with pressure filter and softening.
11	Lack of groundwater protection protocol for Sandy Hollow	Well protection	Prepare groundwater management plan, monitoring program and well head protection.





No.	IWCM Issue	Strategy	Preferred Scenario
12	Lack of comprehensive algal management protocol	Management plan	Develop comprehensive algal management plan.
		MBK and DEN water treatment	Inclusion of PAC for quality improvement at MBK and membrane filter and softening at DEN.
13	Water supply and environmentally sound sewage treatment processes at risk due to inadequate risk identification and emergency response strategy for water and sewer infrastructure	Contingency plan	Develop comprehensive water supply contingency plan (including human resources and flood impact).
14	Need to improve septic systems management	On site systems	Education program for better on-site septic system management and regular auditing (including increasing licensing of systems).
		Best-practice onsite management systems compliance	New systems to comply with best-practice on-site sewer effluent management policy.
		Sewer new growth (SH)	Provision of reticulated sewerage.
		Sewer new growth (DEN)	Provide sewer service to DEN new growth and core area growth.
		Sewer new growth (MBK)	Provide sewer to MBK new growth and core area growth.
15	Poor catchment management practices, urban stormwater, effluent discharges, over-extraction and salinity have affected water quality in rivers	SMP	Implement Stormwater Management Plan (and update when required) and impose levy.
		Catchment initiative	Implement State of the Environment Report and support CMA to implement catchment initiatives.
		Trade waste plan	Trade waste officer to review, manage and implement trade waste policy.
		Stormwater harvesting	As in 1
		Demand Management	As in 1
		Effluent management	As in 1
16	Insufficient fluoridation to meet NSW Health guidelines	Fluoridation	Meet NSW health guidelines.

Implementation and Monitoring

Monitoring is an essential part of the IWCM process to ensure that the management strategies which have been identified as part of this study have been successful at addressing the water cycle issues. In addition to this, it is important that any new or changes in severity of individual issues are documented and appropriate changes made to the Strategy document, capital works program and financial plan.

It is recommended that this document be reviewed in 2012 and every five years afterwards on an ongoing basis.

