RVC IWCM Strategy Web Page

Integrated Water Cycle Management (IWCM) Strategy Plan.

This web page provides information on Council's proposed Integrated Water Cycle Management (IWCM) Strategy Plan. The information is provided for public comment. All information including data and financial analysis is preliminary only and will be subject to the public and stakeholder consultation process as well as Council's adoption of the final Strategy.

Contents

Integrated Water Cycle Management

IWCM is a planning process developed by the NSW Department of Water and Energy (DWE), with defined steps to effectively integrate water supply, sewerage and stormwater to achieve sustainable management of these services.

DWE developed the IWCM Guidelines in 2004 to provide guidance on the development of an IWCM Strategy.

The proposed Richmond Valley IWCM Strategy has followed these guidelines.

IWCM is a way of managing water in which all components of the water system are integrated so that water is used optimally. For a local water utility such as Richmond Valley Council (RVC), this means that the three main urban services – water supply, sewerage and stormwater – should be planned and managed in an integrated way to ensure that the maximum value is obtained from the resources and that benefits to the environment and community are realised.

IWCM deals with the complex linkages between the different elements of the water cycle. It addresses issues facing local water utilities as well as the more general issues facing the environment. An IWCM Strategy Plan considers issues such as:

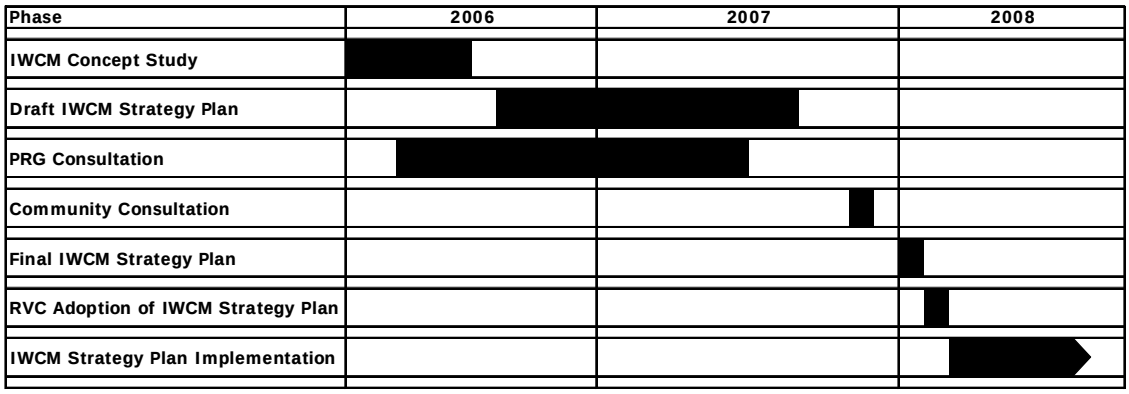
- **The future urban water service needs and customer expectations;**
- **The availability of water including water sources such as rainwater, effluent and stormwater; and**
- **The impact of town water use on other water users including the environment and future generations.**

What Richmond Valley Council is doing

The DWE guidelines set out a three step process for developing an IWCM plan:

- **A concept study: What are the issues?**
- **A strategy: How do we fix the problems?**
- **An implementation phase: How do we know the problems are fixed?**

RVC has prepared the IWCM Concept Study and a draft IWCM Strategy Plan. Throughout the IWCM process, stakeholder consultation was undertaken to ensure that stakeholders contributed to the definition of water cycle management issues and the identification of potential solutions. This was achieved through the formation of a Project Reference Group (PRG) which included representatives from RVC, government agencies, local organisations and the community.



The IWCM process

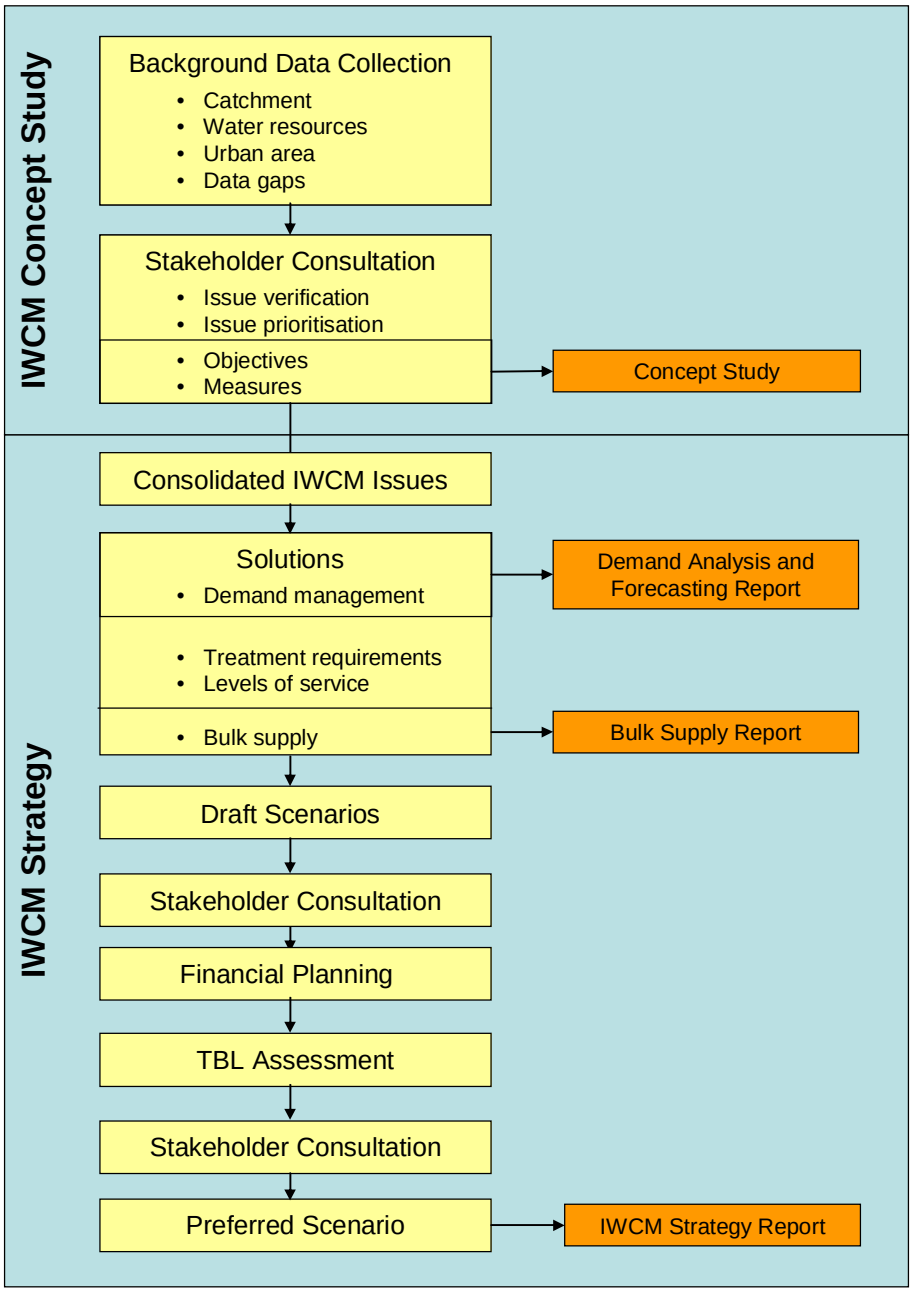
The RVC IWCM Concept Study identified catchment, water resource and urban water cycle management issues relevant to the management and operation of RVC water supply and sewerage businesses. These issues and potential solutions were identified through a stakeholder consultation program and the review of background information.

The IWCM Strategy was developed through the building and assessment of a series of management strategies (scenarios) to address the issues defined in the Concept Study.

Based on the outcomes of the Concept Study and a series of desktop analyses, a number of different management options were developed for each of the water cycle issues identified. Each of the options represents a different level of service to the environment and customers of RVC's urban water services.

Similarly, each option is supported by a different asset management plan depending on the type of infrastructure required to deliver the level of service. This in turn means that each option will have different environmental, social and economic outcomes (both positive and negative).

Each of the scenarios was assessed to identify a preferred scenario for implementation. The different scenarios are assessed on their economic, social and environmental outcomes. The preferred scenario sets out a list of strategic actions to improve the management of the identified water cycle issues over a 30 year planning horizon.



Current Urban, Catchment and Water Resources Situation

RVC is responsible for the extraction, treatment and reticulation of water to the town of Casino. Other towns and villages within the Richmond Valley local government area (LGA) with reticulated water supplies (Coraki, Broadwater/Rileys Hill, Evans Head and Woodburn) are serviced by the Mid and Lower Richmond River (MLRR) bulk water supply scheme operated by Rous Water.

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The population of Casino is expected to increase from 10,504 people identified in the 2006 Census to over 12,000 people in 10-15 years time. Population growth is expected to be the most important driver of demand over the next 30 years. Baseline water forecasts predict that annual average demand in the Casino water supply scheme will rise from 7.2 ML/d in 2006 to 9.8 ML/d in 2036 (a 36% increase in water use).

The vast majority of the Richmond Valley area is rural land and the water supply catchments generally have poor vegetation coverage. Agricultural land uses, including beef cattle, dairying, sugar cane, tea tree oil, poultry and timber, account for almost half of the land. These practices may exert pressures on the quality of water resources through the impacts of vegetation clearing and subsequent erosion, the application of treatments to improve soils or eliminate pests, ploughing and the trampling of soils and destabilisation of stream banks by stock.

The main rivers of the Richmond Valley LGA are the Richmond River and Evans River. Casino town water is extracted from Jabour Weir, in the Kyogle Area sub-catchment of the Richmond River. This sub-catchment is under high environmental and extraction stress due to loss of riparian vegetation, stream bank erosion, bed instability, high usage, structures, water quality and lack of tree cover.

Increasing urbanisation of some sub-catchments of the Richmond River is resulting in alterations to the natural flow regime and subsequently increasing the erosive potential of discharges and pollution loads to waterways.

Jabour Weir is an on-stream storage and has a capacity of 1,623 ML. The reliability of Casino bulk water supply has been investigated for a range of future demand scenarios as part of the IWCM Strategy planning. The reliability of the water supply system is relatively low and level 1 to level 4 restrictions could be expected almost every year. The probability of running out of water in any year is high and a back up source is required Water Restrictions

RVC provides reticulated sewerage services to Casino, Evans Head, Woodburn, Rileys Hill and Coraki. The town of Broadwater and villages of Rappville and Fairy Hill utilise on-site systems for treatment of wastewater. Sewering of Broadwater is expected to be completed by 2009, with sewage transferred to Evans Head Sewage Treatment Plant (STP)

On average, three percent of Casino STP effluent is reused at the Casino Golf Course and 36% for agricultural irrigation by Blue Dog. Effluent from Coraki STP is reused on the golf course. The remaining effluent from Casino, Coraki and Rileys Hill STP is discharged to tributaries of the Richmond River.

The augmentation of Evans Head STP, completed in 2007, will accommodate the growth in the area and meet the stringent licence requirements for effluent disposal with the likely effluent reuse and ebb tide discharge. Casino STP will be augmented in 2009/10 to allow for future population growth.

There are over 2,800 licensed on-site sewage systems in the RVC area. RVC has prepared and is implementing an

On-Site Sewage Management Strategy for the area focusing on existing and new systems. Random audits of the existing systems to assess compliance with legislation and pre-purchase inspections of conditions are undertaken.

A stormwater drainage network consisting of kerb and guttering, pipes, gross pollutant traps, detention basins and natural drainage lines services the urban areas. The system discharges urban stormwater to local creeks, lagoons, the Richmond River and ultimately the ocean.

Urban Water Issues facing RVC

The IWCM Concept Study provides a basis to understand the issues faced by RVC in the provision of water, sewerage and stormwater services. These catchment, water resource and urban issues were identified through the review of existing background information as well as discussions with RVC staff and regulatory authorities and stakeholder consultation.

Following on from the Concept Study, a set of IWCM issues which define the urban water cycle management problems faced by RVC was developed. The IWCM issues were confirmed during the stakeholder consultation program.

IWCM Issues

- Poor town water supply security.
- Lack of ground and surface water sharing plans. RVC must be involved in the water sharing process to ensure town water supplies are adequate.
- RVC must implement sustainable effluent reuse with end user requirements considered.
- Existing land use practices and urban impacts are affecting surface water quality.
- High operating and management costs for water and sewerage systems lead to relatively high typical residential bills.
- RVC must comply with current and future potable water standards.
- Hydrologic stress in catchments contributes to unsustainable extraction particularly during low flows.
- There is a need for sustainable management of onsite sewage systems.
- Stormwater infiltration into sewerage system increases wet weather flows.
- There is a need for sustainable stormwater / rainwater reuse.
- Climate change may adversely alter the rainfall and temperature patterns of the study area.
- Non-conformances at Coraki and Rileys Head sewage treatment plants.
- Poor demand management in terms of consumption and unaccounted for water.
- ASS soils in RVC urban areas potentially impact on sewer infrastructure.

Objectives for IWCM

A series of draft objectives to set the direction of RVC's IWCM Strategy were formulated as part of the stakeholder consultation process and documented in the IWCM Concept Study. These objectives set goals for the future management of the identified water cycle issues.

IWCM Objectives

- Improve land use management through education and demonstration.

- Coordinated approach to sharing of surface and ground waters.
- Maximise high value (priority to substitution of potable water) reuse.
- Increase number of alternative water sources.
- Improved security of urban water supply.
- Provide highest level of service relative to users' willingness to pay.

Options considered

In developing the IWCM Strategy, options to manage water supply, sewerage and stormwater services in the future were assessed in a two part process:

- **Identification and assessment of individual management options; and**
- **Assessment of scenarios (bundles of complementary management options).**

The options investigated were:

IWCM Options

- Regional institutional arrangements
- Demand management
- Treatment capacity
- Security of supply
- Emergency backup
- Effluent management
- Stormwater harvesting
- UFW reduction
- Water Sharing Plan (WSP)
- Effluent reuse education
- On-site sewage management
- Environmental flows provision
- Stormwater quality improvement and management
- Salt water intrusion reduction
- Catchment management initiatives
- Flood management
- Blue-green algae management
- STP point source contamination control
- Other point source contamination control
- Education on sustainable land management practice
- Financial management
- Asset renewals
- Water treatment process upgrade
- Drinking water quality improvement
- Rainwater tanks
- Risk management
- Alternative water sources
- Sewage treatment process upgrade
- Unaccounted-for-water reduction

- Acid sulfate soil management

Preferred IWCM Scenario

Having identified and evaluated a range of opportunities to manage each of the IWCM issues, five draft scenarios were established. The scenarios were:

- A "base" case (B) also known as "business as usual", which does not include any solutions beyond what RVC is already doing to improve or maintain the water supply and sewerage businesses;
- A "traditional" case (T) based on traditional solutions that solve issues in an isolated, non-integrated way; and
- Three "integrated" solutions (IN 1, IN 2 and IN 3) that incorporate combinations of various build and non-build options and integration of water supply, sewerage and stormwater management by including recycled water use and stormwater harvesting, among other options.

Tailoring the IWCM process in this way ensured that that a high number of potential options were investigated and assessed at the preliminary stage without compromising the ability of the final outcome to provide effective management solutions.

Each of the five draft scenarios combines complementary management options to provide RVC with solutions to the water cycle management issues. The main features of the draft scenarios are listed below.

Scenario	Demand Management	Security of Supply	Effluent Recycling
Base Case (B)	None	Not secure.	Golf course and agricultural irrigation (Blue Dog)
Traditional (T)	Low level	Source Investigation	B + sporting fields, industry
Integrated 1	High level	Source Investigation	B + sporting fields, industry
Integrated 2	High level	T + Increase of security through dual reticulation	T + Dual reticulation for new development
Integrated 3	High level	T + Increase of security through Indirect Potable Reuse	T + Indirect potable reuse

The scenarios developed were ranked based on their performance against a series of economic, social and environmental measures (a Triple Bottom Line assessment). The preferred scenario was determined through consultation with the PRG, steering committee and the TBL assessment.

Based on the results of the consultation program and the scenario ranking, Integrated 3 was identified as the preferred scenario for implementation. However, the PRG found that the implementation of this scenario will require a relatively long lead time due to the investigations, risk assessment and consultation required for the indirect potable reuse component. The PRG considered that the scenario "Integrated 1" should be adopted as a short term solution. Also, the PRG agreed that it was worth considering dual reticulation for new development (from Integrated scenario 2) if feasible.
Therefore, a hybrid of Integrated Scenarios 1, 2 and 3 has been identified by RVC as the preferred scenario. The preferred scenario is summarised below.

IWCM Issues		Strategies	Preferred Scenario
1	Poor town water supply security	Regional institutional arrangements	Conduct feasibility study into regional water supply arrangements including connection of Casino system to Rous Water and RVC management of Lower Richmond River supply
		Demand management	High level demand management (BASIX, pricing, education, UFW reduction, showerhead retrofit, business audit and water conservation order)
		Regional demand management	Regional Demand Management Strategy
		Treatment capacity	Present WTP capacity 23 ML/d. No augmentation required.
		Security of supply	SBP cost allocation for augmentation. Alternate Source Investigation. Increase of security of supply through indirect potable reuse and/or dual reticulation (if feasible in future).
		Emergency backup	Include consideration of alternative emergency supplies in Alternate Source Investigation
		Effluent management - Casino	Reuse at Golf Course and agricultural irrigation (Blue Dog), Blue Circle cement, sporting fields. In future, dual reticulation for new development and indirect potable reuse to be considered.
		Effluent management - LRR	Coraki golf course, irrigation of sporting fields and open space areas. In future, dual reticulation for new development and recharge Woodburn aquifer to be considered.
		Stormwater harvesting	Encourage individual development / industry to harvest stormwater.
		UFW reduction (metering)	Metering in distribution system.
		UFW reduction (renewal)	Condition based asset renewal.
		UFW reduction (leak detection)	UFW reduction as in Demand Management above.
2	Lack of ground and surface water sharing plans. RVC must be involved in the water sharing process to ensure town water supplies are adequate.	Macro Water Sharing Plan (WSP)	Contribute to DNR Macro WSP development process.
3	RVC must implement sustainable effluent reuse with end user requirements considered.	Effluent management	As in 1.
		Education	Education on effluent reuse when and if dual reticulation and/or indirect potable reuse are implemented.

IWCM Issues		Strategies	Preferred Scenario
4	Existing landuse practices and urban impacts are affecting surface water quality	On-site sewage management (design regulation)	Regulated on-site system design approval.
		On-site sewage management (monitoring)	Implement existing program (RVC On-site Sewage Management Strategy).
		On-site sewage management (improvement)	Incentives for better on site technologies.
		Environmental flows	Water sharing process as in 2, indirect potable reuse to increase base flows if implemented in future.
		Stormwater quality improvement and management	Full implementation of Stormwater Management Plan (2005).
		Salt water intrusion reduction	Water sharing process as in 2
		Catchment management initiatives	Liaison with CMA to implement Northern Rivers CMA Catchment Action Plan.
		Water Sharing Plan	Water sharing process as in 2
		Flood management	Full implementation of Flood Management Plan (2002).
		Blue-green algae management	As per Emergency backup in 1, environmental flows in 4, and regional institutional arrangement (via alternate source) in 1.
		STP point source contamination control	Augment Casino, Coraki, Evans Head STPs, targeted renewals at Rileys Hill STP.
		Point source contamination control	Liaison with DEC to enforce POEO licence requirements.
		Education	Education on sustainable land management practices.
5	High operating and management costs for water and sewerage systems lead to relatively high typical residential bills	Financial management	Update DSP and Financial Plan, apply full cost recovery pricing (Demand Management as in 1) and Designed to be self funding and less costly. Greater access to funds through diversified services and product delivery.
		Water and sewerage asset renewals	Condition based asset renewal.
6	RVC must comply with current and future potable water standards.	Treatment plant process upgrade - Casino	Current process includes sedimentation and filtration. Addition of PAC and KMnO4, review and adjust current operational procedure.
		Drinking water quality	As per Rous water supply with quality compliance clause in Service Level Agreement.
7	Hydrologic stress in catchments contributes to unsustainable	Regional institutional arrangements	As in 1.
		Emergency backup	As in 1.

IWCM Issues		Strategies	Preferred Scenario
	extraction particularly during low flows.	Demand management	As in 1.
		Catchment management initiatives	As in 4.
		Environmental flows	As in 4.
8	There is a need for sustainable management of onsite sewage systems.	On-site sewage management systems (design regulation, monitoring and incentives)	As in 4.
9	Stormwater infiltration into sewerage system increases wet weather flows	Sewerage asset renewals	Infiltration / inflow reduction program and asset renewal as in 5.
10	There is a need for sustainable stormwater / rainwater reuse	Rainwater tanks	As in demand management of 1 (BASIX).
		Stormwater harvesting	As in 1
11	Climate change may adversely alter the rainfall and temperature patterns of the study area	Risk management	Sensitivity analysis on yield with reduced rainfall.
		Alternative water sources	As in 1 (Regional institutional arrangements, emergency back up, demand management, effluent management, stormwater harvesting, UFW reduction).
12	Non-conformances at Coraki and Rileys Head sewage treatment plants	Treatment plant process upgrades	As in 4 (STP point source contamination control)
13	Poor demand management in terms of consumption and unaccounted for water	Demand management	As in 1
		UFW reduction	As in 1
14	ASS soils in RVC urban areas potentially impact on sewer infrastructure	New infrastructure to consider ASS impacts	Implement DCP5 - Acid Sulfate Soils: identification, assessment and management.
		Renewal program to consider ASS impacts	Renewals to consider ASS impacts.

Implementation Process

The implementation of the preferred scenario is reliant on RVC's commitment to the capital works program developed as part of this Strategy, as well as its ability to maintain financial stability over the next thirty years.

A summary of the financial implications of the preferred scenario is given in the following table. These costs do not include dual reticulation and indirect potable reuse options (components of integrated scenarios 2 and 3).

Component	30 year Capital Works Program ($'000)	30 year OMA Expenditure ($'000)	Typical Residential Bill ($/assessment)

Component	30 year Capital Works Program ($'000)	30 year OMA Expenditure ($'000)	Typical Residential Bill ($/assessment)
Water Supply	26,800	80,300	445
Sewerage	172,000	250,000	770
Total	198,800	330,300	1,215

The current water bill may be reduced slightly and the sewerage bill may need to increase if the preferred scenario is implemented. A financial plan is required to determine the most appropriate medium term price paths and funding scenarios.

Your Feedback is Welcome

The Richmond Valley Integrated Water Cycle Management Strategy Plan is now on public exhibition until at least Friday December 14, 2007. Council will consider submissions up until this date.

The report (including attachments) can be viewed at Council's offices or downloaded from this website.

Responses and feedback can be provided to Council via fax or email:

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Following the exhibition period, a report will be presented to Council detailing the submissions received and recommending a Strategy Plan for adoption.

Draft - Integrated Water Cycle Management (IWCM) Strategy Plan.pdf