Case Study

4.1 Our Water Resource CATCHMENT

What is a catchment?

A catchment is the area of land that supplies surface water to a common collection point - usually a creek, river, dam or the ocean. The edge of a catchment is bordered by hills or ridges that direct the flow of water.

Catchments can vary in scale from the suburb you live in through to entire regions covering thousands of square kilometres. Many smaller catchments can be located within one large catchment.

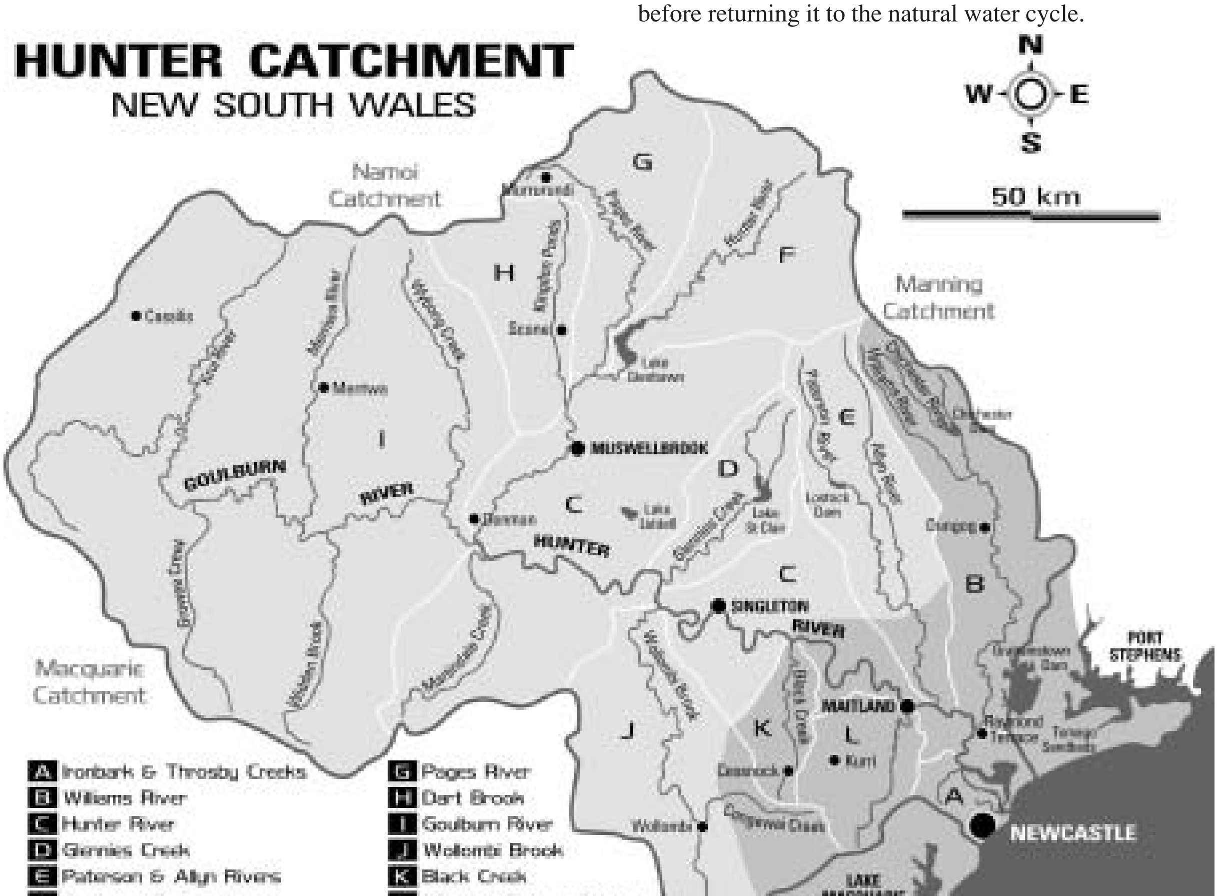
Catchments may be completely natural, or a combination of bushland, agricultural, industrial and urban areas. The types of land use and surfaces found in a catchment will have a major effect on the quality and quantity of water found in the catchment zone.

Breaking the water cycle

The natural water cycle involves evaporation over the oceans, condensation into clouds, precipitation over catchments, run-off collecting in creeks, rivers and lakes, which eventually flow back into the oceans. In this way the world's water has been 'recycled' for millions of years - and since we never really get new water supplies, keeping it clean is very important.

Water is essential for the survival of all life on earth. For humans this means interrupting the natural water cycle to provide homes, farms and industry with large volumes of reliable and clean water and then properly treating the wastewater created before returning the water to nature.

Hunter Water has the responsibility in the Hunter region for collecting, storing, treating and delivering water. It is also in charge of collecting and treating wastewater before returning it to the natural water cycle.



Case Study C

4.1 Our Water Resource CATCHMENT

Catchments and water sources

Hunter Water's water sources are Chichester Dam, Grahamstown Dam and the Tomago Sandbeds, all closely located in either the Williams River or Port Stephens catchments. Management and protection of these two catchments are essential to the management of our water supply system.

Integrated Catchment Management (ICM) links Hunter Water, government departments, councils, industry, farming and community groups to coordinate protection of individual catchments.

Catchments and water quality

The Hunter is one of few regions in the world with large protected catchments for its water supply reservoirs. Very few or no people live in the reservoirs' catchments. As well, public access, recreation and other activities that could degrade water quality are minimised.

Although we are lucky to have well-protected water supply catchments, there are still many factors that affect the remainder of our catchment areas. These are a combination of human and non-human (let's say 'natural') influences.

Natural influences of catchment water quality

- Geology and soil types. For example, weathering basalt contributes phosphorus to our waterways.
- Vegetation coverage maintains cleaner water through minimising erosion and dryland salinity, and acting as a filter of surface water.
- Climate influences the volume of water in waterways, either diluting or concentrating contaminants.

Human influences of catchment water quality

- Urban and industrial development may remove native vegetation, increase soil erosion, and be a source of stormwater runoff containing nutrients, litter, heavy metals, and bacteria.
- Agriculture may remove vegetation and increase nutrient and sediment loads to the water.
- Recreation within or beside waterways can create soil erosion and be a source of pollutants such as greases and oils, nutrients, sediment and litter.

Keeping catchments clean is crucial to the quality of our water. Hunter Water works with the NSW Environment Protection Authority (EPA), NSW Department of Sustainable Natural Resources, NSW Fisheries, NSW Agriculture and many local community groups to protect our catchments.

Monitoring catchments

The population and diversity of aquatic life are easily affected by environmental stresses. Water quality monitoring involves checking for changes in aquatic life and chemical and physical parameters. It provides valuable information on the health of a waterway and the likely stresses it is facing.

Protect your catchment!

Show others what can be achieved

Set a good example by conserving and recycling water, and composting food scraps for starters.

Join a community group

Join a local community group and play an active and rewarding role in protecting your environment and your local catchment area.

Don't overuse detergents and cleaners

Wash cars on the lawn, keep fertilisers and animal manure away from drains, and use correct doses of chemicals.

Choose the right product

Use environmentally friendly products, recycle where possible, and dispose of waste material carefully to minimise pollution and nutrients entering our waterways.

Keep sediment out of waterways

Stop suspended particles such as silt, clay, sand, and other wastes entering waterways. These sediments can reduce light penetration needed for photosynthesis and absorb heat which warms the water and reduces oxygen levels.

Maintain grass and tree cover

Keep grass and/or tree cover where possible to stop soil from washing into gutters, drains or waterways.

Keep organic matter out of waterways

Ensure organic matter from your property - including leaf litter, animal droppings, lawn clippings and garden waste - does not find its way into gutters, drains or waterways.

Properly maintain your septic tanks

Clean septic tanks and, if necessary, move the transpiration area or get a new system that spreads waste over a larger area.

Store and dispose of pollutants carefully

Properly store and dispose of grease and sump oil, paint products, pesticides, fertilisers, chemicals and poisons.

Acknowledgement

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Case Study C

4.2 Water & Wastewater Services FOR THE MAITLAND COMMUNITY

Hunter Water Corporation

The Hunter District Water Board was established in 1891 to provide reliable and clean drinking water and to collect and treat the community's wastewater. In 1991, Hunter Water became a corporation to raise efficiency, performance and accountability, and to reduce operating costs and charges to its customers.

Hunter Water Corporation (HWC) provides water and wastewater services for residents and industry in Newcastle, Lake Macquarie, Maitland, Cessnock and Port Stephens.

Hunter Water's Objective - Continuous improvement in being commercially successful and in delivering value-for-money water, wastewater and associated services in an environmentally responsible way.

Hunter Water's links with Maitland

Hunter Water has strong links with the Maitland region. Walka Water Works was the lower Hunter's earliest water source. This facility was constructed in 1887 on the Hunter River floodplain just north of Maitland. Until decommissioning in 1947, water was piped 35 kilometres from the Works to Newcastle.

Today, most of Maitland's drinking water comes from Chichester Dam, and is distributed through a system of reservoirs - the largest being at Stoney Pinch, Cessnock, Buttai, Neath, Rutherford, Pelton and Rothbury.

Hunter Water also operates wastewater treatment works at Morpeth, Farley, Kurri Kurri, Cessnock, Kearsley, Paxton and Branxton. Over the past 15 years most of Hunter Water's wastewater treatment works have been upgraded. These improvements cater for population growth and provide increased protection for local waterways and catchment areas around Maitland.

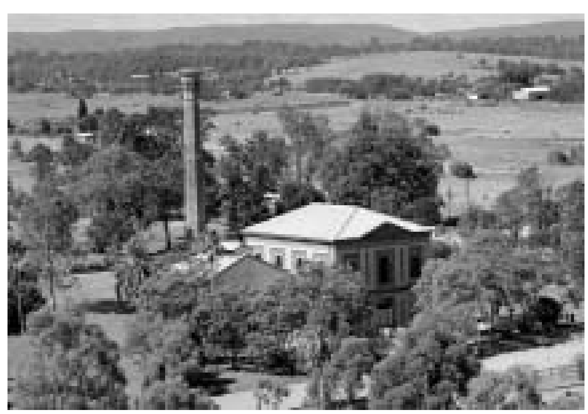
Hunter Water's operating profile

The water supply to customers meets the most recent guidelines for drinking water set by the National Health and Medical Research Council.

The community's wastewater is biologically treated. Clear, treated effluent is then discharged to waterways or reused where it is economical and where there are real environmental benefits for the community.

Population Served	495,000
Total Asset Value	$1.9 billion
Total Annual Revenue	$125 million
Permanent Workforce	430 staff
Water Treatment Works	5
Water Connections	199,000
Water Mains System	4,270 km
Water Reservoirs	77
Pumping Stations	74
Grahamstown Dam	152,000 ML
Tomago Sandbeds	60,000 ML
Chichester Dam	21,500 ML
Anna Bay Sandbeds	16,000 ML
Wastewater Works	17
Sewer Connections	187,000
Sewer Mains System	4,440km
Wastewater Pump Stations	364

ML = megalitre (one megalitre is 1 million litres; an Olympic swimming pool is about 800,000 litres).



Walka Water Works (Oakhampton) was built in 1887 to supply domestic water to Newcastle and the Lower Hunter.

Case Study C

4.2 Water & Wastewater Services FOR THE MAITLAND COMMUNITY

Managing water resources

Hunter Water extracts raw water under a licence issued by the Department of Sustainable Natural Resources (formally Department of Land & Water Conservation). The licence requires Hunter Water to protect the environments affected, such as the Williams River, by monitoring these catchments and developing strategies to minimise the impact of water extraction.

Raw water is treated at Water Treatment Plants (WTPs) to ensure supply of high quality drinking water. This water must comply with the current National Health and Medical Research Council (NHMRC) Drinking Water Quality Guidelines (1996) (*www.health.gov.au/nhmrc*).

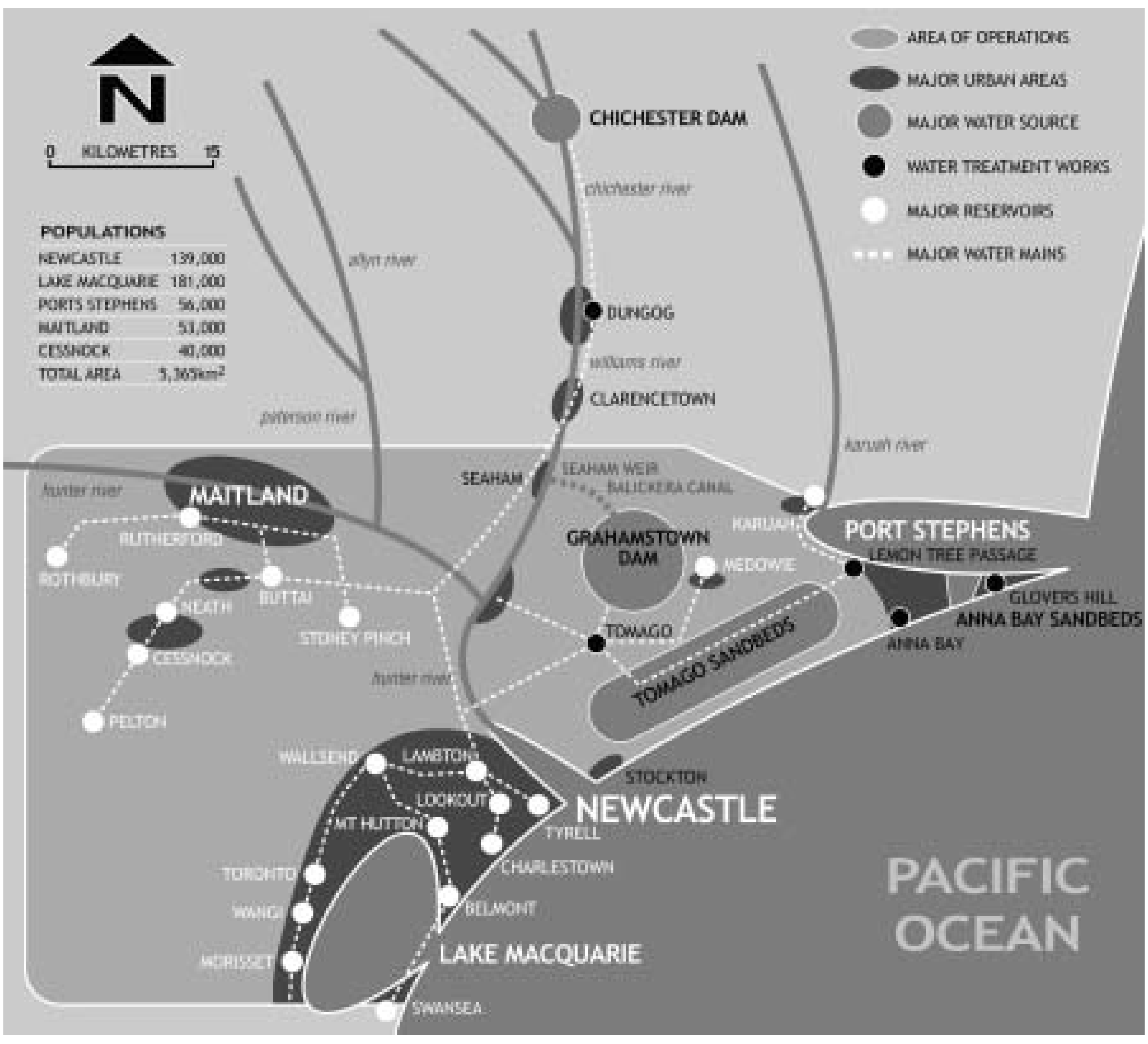
Guaranteeing future water supply

Hunter Water guarantees future water supply by:

- helping to manage and protect local catchments;
- development of a drought management plan;
- promoting water conservation;
- promoting the use of recycled water where possible;
- supporting pricing that rewards water conservation;
- educating the community about water issues; and
- optimising existing water sources before developing new ones.

Consumers can also guarantee future water supplies by:

- using water-saving devices (e.g. dual flush toilets, efficient shower roses) and AAA-rated appliances;
- watering gardens at night rather than during the day;
- sweeping paths instead of hosing them;
- only washing full loads of clothes, and
- repairing leaking taps around the home.



LOWER HUNTER WATER SUPPLY INFRASTRUCTURE

Case Study C

4.2 Water & Wastewater Services FOR THE MAITLAND COMMUNITY

Sources of raw water

Raw water used by Hunter Water includes surface waters from Chichester and Grahamstown Dams, and ground waters from Tomago and Tomaree sandbeds.

Tomago sandbeds, Grahamstown and Chichester dams

Water from Chichester, Grahamstown and Tomago contains some naturally present impurities, which need to be removed by filtration. The raw water may contain clays, silts, natural organic matter, iron and manganese, and micro-organisms. In addition, the natural pH of the water may need adjustment.

Tomaree sandbeds

Untreated water from the Tomaree sandbeds requires only disinfection, fluoridation and pH adjustment.

Issues connected with raw water use

As outlined above, Hunter Water must provide some treatment of raw water to make it suitable for drinking. The issues that may arise if raw water includes:

- clays and silts cause 'cloudy' water and particles can shield micro-organisms from disinfection;
- natural organic matter, iron and manganese can cause taste, odour and discolouration problems;
- high or low pH causes corrosion, taste and odour problems, and ineffective disinfection;
- micro-organisms can cause pathogenic illness.

Good drinking water

Drinking water should be safe to use and aesthetically pleasing. It should be clear and colourless, with no unpalatable taste or odour. As well, it should contain no suspended matter, harmful chemical substances or pathogenic micro-organisms.

KEY PARAMETERS

PHYSICAL:
Turbidity, pH level, Colour

CHEMICAL:
Iron, Manganese, Aluminium, Copper, Lead, Zinc, Fluoride, Chlorine, Trihalomethanes

MICROBIOLOGICAL:
Total Coliforms, Faecal Coliforms

Standards for these parameters are set by the National Health & Medical Research Council (NHMRC) Drinking Water Guidelines.

The water treatment process

① RAW WATER

Rain, river and dam water is diverted and stored in dams, then transported to treatment plants.

↓

② COAGULATION / FLOCCULATION

Liquid aluminium sulfate (alum) and/or polymer is added to the raw water causing tiny dirt particles in the water to stick together (coagulate). The particles eventually form larger, heavier particles called flocs which are easier to remove by settling or filtration.

↓

③ SEDIMENTATION

The water and the floc particles progress into sedimentation basins where the water moves slowly causing the heavy floc particles to settle to the bottom. Floc that collects on the bottom of the basin is called sludge and is piped to drying lagoons. In 'direct filtration' sedimentation doesn't occur and the floc is removed by filtration only.

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④ FILTRATION

Water flows through a filter designed to remove particles in the water. The filters are made of layers of sand and gravel, and in some cases, crushed anthracite. Filtration catches the suspended impurities in water and improves the effectiveness of disinfection. The filters are routinely cleaned by a process called 'backwashing'.

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⑤ DISINFECTION

Disinfection removes disease-causing bacteria, viruses, and parasites. Chlorine is very effective at guarding against possible biological contamination in the water distribution system.

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⑥ FLUORIDATION

Water is fluoridated to improve dental health as required by the Fluoridation of Public Water Supplies Act (1957).

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⑦ pH CORRECTION

Lime is added to adjust the pH and stabilise the naturally soft water, minimising corrosion in water pipes.

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⑧ SLUDGE DRYING

Solids collected during sedimentation and filtration are removed to drying lagoons.

↓

⑨ DISTRIBUTION

Treated water is transported to storage reservoirs for distribution to homes and industry.

4.2 Water & Wastewater Services FOR THE MAITLAND COMMUNITY

Treating wastewater

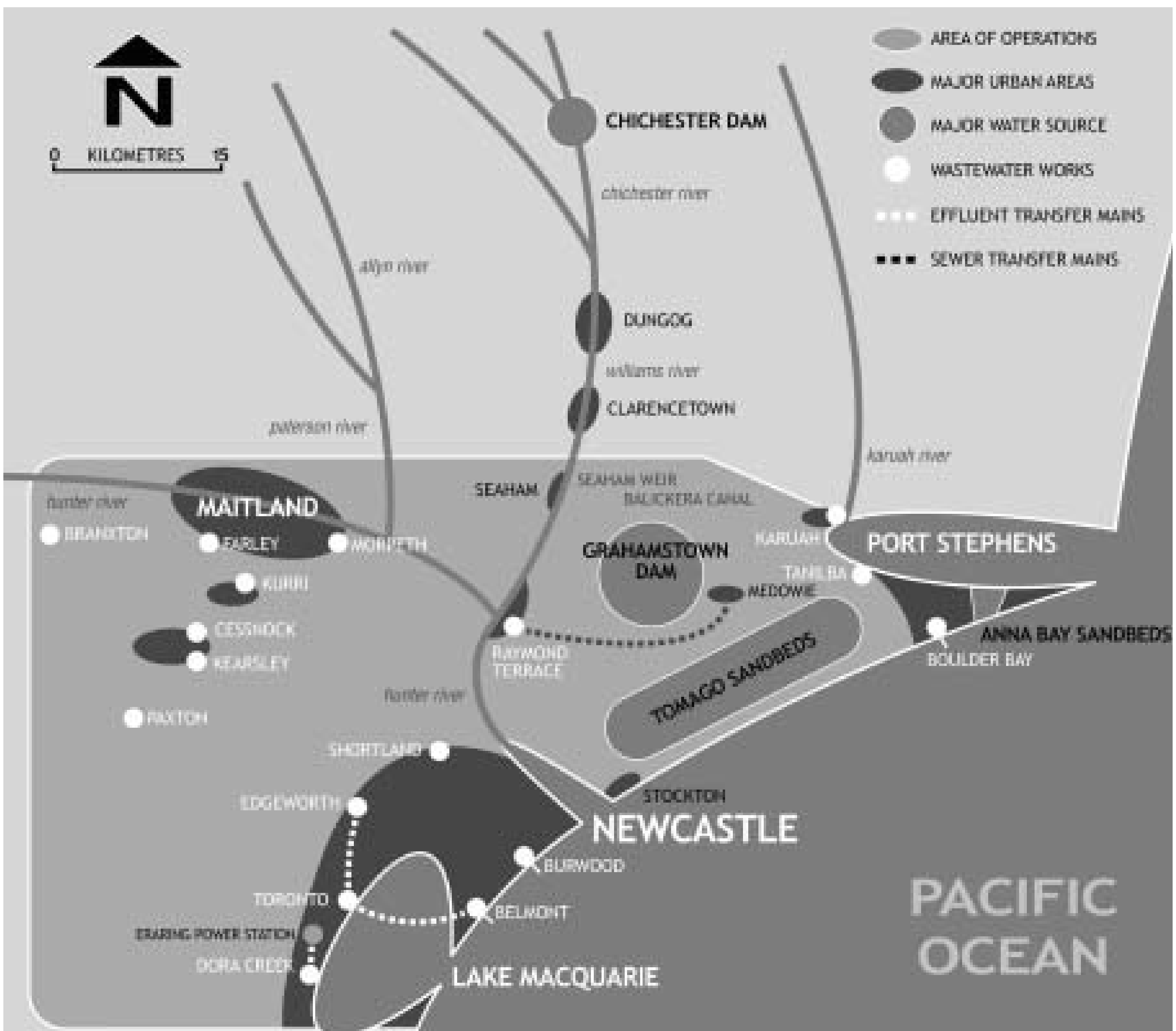
People use water for many activities, most of which contaminate water in some way. This contaminated water is called 'wastewater'. It must be collected, treated and returned to the natural water cycle with minimal impact to the environment.

Hunter Water has upgraded all of its Wastewater Treament Works (WWTW) over the past 15 years to reduce the impact of wastewater on local catchments and waterways. Hunter Water's WWTWs use naturally-occurring bacteria to break down wastewater into simpler and safer substances. The further removal of phosphorus involves the use of metal salts. The disinfection stage uses ultraviolet light or chlorine (with water being declorinated before release by using sulphur dioxide).

Protecting the environment

The water reclaimed during treatment is disinfected and returned to local creeks and rivers. At Hunter Water's coastal plants saltwater and sunlight help to purify this reclaimed water. All discharges must comply with EPA guidelines and Hunter Water's Operating Licence.

The sludge and biosolids produced during treatment are further treated, then dewatered and recycled in local industrial projects. These projects include minesite rehabilitation, industrial landscaping, native woodlots and co-composting facilities. All recycling of water and biosolids must also comply with EPA guidelines.



LOWER HUNTER WASTEWATER TREATMENT INFRASTRUCTURE

Case Study C

4.2 Water & Wastewater Services FOR THE MAITLAND COMMUNITY

What is wastewater?

Wastewater comes from homes, commercial premises, schools, colleges, hospitals, manufacturing and industrial factories. At times wastewater will also contain varying amounts of stormwater from infiltration.

Wastewater contains approximately 99.9% water and 0.1% solids. Expressed in another way, every 1,000 kilograms (or 1,000 litres) of wastewater contains about 1 kilogram of solids. The solids are made up of organic and inorganic compounds suspended in the wastewater.

Volatile solids, which comprise about 70% of the wastewater solids, give the water its unpleasant characteristics. The majority of the solids - carbohydrates, fats and proteins - are broken down during treatment into more stable inorganic compounds by bacteria/micro-organisms.

Wastewater also contains some organic compounds that are very resistant to normal treatment processes. Such compounds include detergents, plastics and cellulose.

WASTEWATER COMPOSITION

ORGANICS:
Carbohydrates, Fats, Oils, Grease, Pesticides, Herbicides, Insecticide, Phenols, Proteins, Surfactants, Volatile Organic Compounds

INORGANICS:
Acidity or alkalinity (pH), Chlorides, heavy metals, Nitrogen, Phosphorus, Sulphur

GASES:
Hydrogen Sulphide, Methane, Oxygen

Biological treatment: air is pumped through the wastewater providing oxygen to micro-organisms as they break down the waste.

The wastewater treatment process

① SCREENING
Non-biodegradable solids and objects are removed from the wastewater by selective screening. These screenings are usually compressed and sent to a landfill site.

② GRIT REMOVAL
Grit and sand is normally separated from the wastewater in a small vortex tank which is designed to permit only the heavier solids (grit) to settle. The grit is collected, washed and then sent to a landfill site.

③ FLOW BALANCING AND ODOUR CONTROL
Flow equalisation tanks provide a means of smoothing out fluctuating flows and limiting the maximum flows entering the treatment works in time of wet weather. The inlet works is fully covered to contain odours which are treated by a soilbed filter underground.

④ BIOLOGICAL TREATMENT
Biological processes are designed to break down organic matter into simpler chemical substances such as carbon dioxide, methane and nitrates. The processes are carried out by micro-organisms which obtain food from the organic matter in the wastewater.

⑤ CLARIFICATION
Biological solids settle out from the effluent in large concrete clarifiers (tanks). The solids are often recycled back to the bioreactor and the clear effluent flows on to the disinfection system.

⑥ DISINFECTION
Potentially harmful bacteria are killed through a disinfection process involving high intensity ultraviolet (UV) lights and/or additions of chlorine to the effluent.

⑦ DISCHARGE EFFLUENT
The effluent (or reclaimed water) is either discharged via pipelines to the Hunter River or may be reused on local golf courses or woodlots.

⑧ SLUDGE DRYING
The sludge (solids/bacteria) resulting from the treatment processes is dewatered forming a biosolid that can be reused in suitable industrial recycling projects.

Acknowledgement

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Case Study C

4.3 The Impact & Management of FLOODING IN MAITLAND

The history of flooding in Maitland

Maitland was brought to prominence during Australia's early European settlement by its location on fertile floodplains at the highest navigable part of the Hunter River. This location, however, was also a weakness because of the constant danger of flooding. Although it was clear to the early settlers that the low-lying areas of Maitland were subject to flooding, this did not deter their development.

Throughout the history of settlement on the Hunter River, floods have been frequent and their impacts widespread and severe. The first recorded flood at Maitland was in 1820. From 1819 to 2000 Maitland recorded over 200 floods. Over 70 floods exceeded the critical level of 8 metres at the Belmore Bridge. Of these, the 1955 was the highest (12.1 metres), although it is thought that the flood of 1820 may have reached a similar level.

Rainfall over the Hunter catchment between 22nd and 28th February 1955 averaged 270 millimetres, with 430 millimetres along the Liverpool Range. This rain fell on an already saturated catchment and the resulting flood volume was one-and-a-half times the river's mean annual discharge.

In the early hours of Friday 25th February, floodwaters at Maitland reached their peak, flowing at over 100,000m^3 per second (or 100 ML per second). At this time, the west bank just north of Maitland gave way and the river poured into the city.

Flooding in eastern High Street, West Maitland. A timber wall had been constructed to keep the river out of High Street. This was the original course of the river until the change in 1893. This photograph could have been taken then or possible during the 1913 flood.
[Source: Maitland City Council collection, in Walsh & Archer 2000]

Tearing of the 1955 floodwaters at the old Belmore Bridge, taken from Lorn looking back towards the Courthouse and High Street.
[Source: Maitland City Council 1983]

The 1955 flood resulted in the loss of fourteen lives, the destruction of many homes, and the inundation of thousands of hectares of productive farmland. 248 hectares of rich alluvial land over a length of 82 kilometres was lost (i.e. 23 million m^3 of soil). Markers to show the highest flood levels from the 1955 event were placed on telegraph poles between Maitland and Hexham. Some of these are still visible today, although apparent impacts on property prices have seen many of these history markers removed.

The 1955 flood put Maitland back on the map and the city has had a reputation for flooding ever since. This was possibly due to the dramatic Cinesound newsreel footage that was shot during the flood and shown throughout Australia and across the world.

The 1955 flood was the first major natural disaster to be communicated to the broader community via the movie screen. The footage involved a dramatic helicopter rescue involving two men being killed whilst in the process of being rescued, and the helicopter crashing after hitting high tension wires. The crew of the helicopter were rescued from the floodwaters by an army duck two miles downstream from the disaster. The helicopter disappeared and was not found until some weeks later, covered by silt in Fishery Creek.

Case Study C

4.3 The Impact & Management of FLOODING IN MAITLAND

Flood mitigation

The 1955 flood was particularly severe as early flood protection works were poorly planned and constructed haphazardly around the Maitland area from the late 1850s until 1930. We now know that the early levees blocked natural flood relief channels and were often located too close to the main river channel. The work was usually carried out by farmers without technical advice, with the objective of excluding all floodwaters.

Without a co-ordinated valley-wide plan, the construction of one levee often led to the construction of another and another (and so forth) as farmers tried to protect their own properties from the impact of floodwaters off their neighbours' land. Flood heights and velocities were increased by the high levee banks, which increased the damage to life and property across the floodplain.

Hunter Valley Flood Mitigation Scheme

Following the 1955 flood, the State Government passed the Hunter Valley Flood Mitigation Act in December 1956. The Act authorised the Department of Public Works with the financial assistance of the Hunter Valley Conservation Trust, to carry out properly-designed flood mitigation works. The 1955 flood also gave impetus to the development of floodplain management, which is now the preferred approach to reducing flood impacts in the Hunter Valley.

The Hunter Valley Flood Mitigation Scheme and its infrastructure aimed to:

- reduce the frequency of flooding;
- reduce the time floodwaters remained on the land after a flood passes; and
- control the direction and velocity of floodwaters to reduce damage to farmland and property.

Smaller floods are to be confined to the river. In the case of larger floods the aim is to gradually allow floodwaters to spill into natural flood basins along the river. Land is then restored to normal production by providing adequate drainage channels and floodgate outlets.

Features of flood mitigation:

Levees

Levees are grassed earth embankments built along the river to confine the waters of smaller floods. They are constructed with gentle back slopes to reduce risk of scour and failure when overtopped. After a large flood, floodwaters are trapped behind levees and in many places enlarged flood drains have been built to return the water to the river in a reasonable time.

Floodgates

A floodgate is contructed where flood drains pass through a levee. These structures have a flap that only opens when the water level behind the levee is greater than that in the river, allowing trapped water to flow out.

Spillways

A spillway is the section of levee at the entrance to a floodway, which is the natural cross-country passage of overbank floodwaters. Spillways allow large volumes of floodwater to leave the river in a controlled manner.

Control banks

Control banks are built perpendicular to the direction of flow along the length of some floodways. They form a series of basins that reduce the water velocity by dropping the floodwaters in steps safely across the land.

Bank protection

Bank protection works are provided along the river in areas where serious erosion is occurring due to scouring action during floods.

The most significant parts of the Hunter Valley Flood Mitigation Scheme are in the Maitland area and comprise the Oakhampton and Bolwarra floodways, the Maitland levee and ring levees, and the Louth Park levees. A map of the scheme is provided on the following page.

Future flooding in Maitland

Maitland will always be subject to floods. The continuing debate, however, is on the severity of future flood events. One possibility is that Glenbawn Dam, which was still under construction at the time of the 1955 flood, would absorb most, if not all, of any excessive run-off coming from the Mount Royal Range. This would mean that flooding from a 1-in-100 year event, like the 1955 flood, would be moderated to a lower category such as a 1-in-20 year event.

The Hunter Catchment Management Trust is the governing body responsible for flood mitigation and floodplain management. As a matter of policy, the Trust takes the view that another 1-in-100 year flood will probably occur again and plan accordingly.

Acknowledgement & References

This case study has been prepared by Stefan Weyer (Oakhampton Landcare). Other information sources included:

Maitland City Council 1983, *A new history of Maitland,* Maitland, NSW: Maitland City Council.

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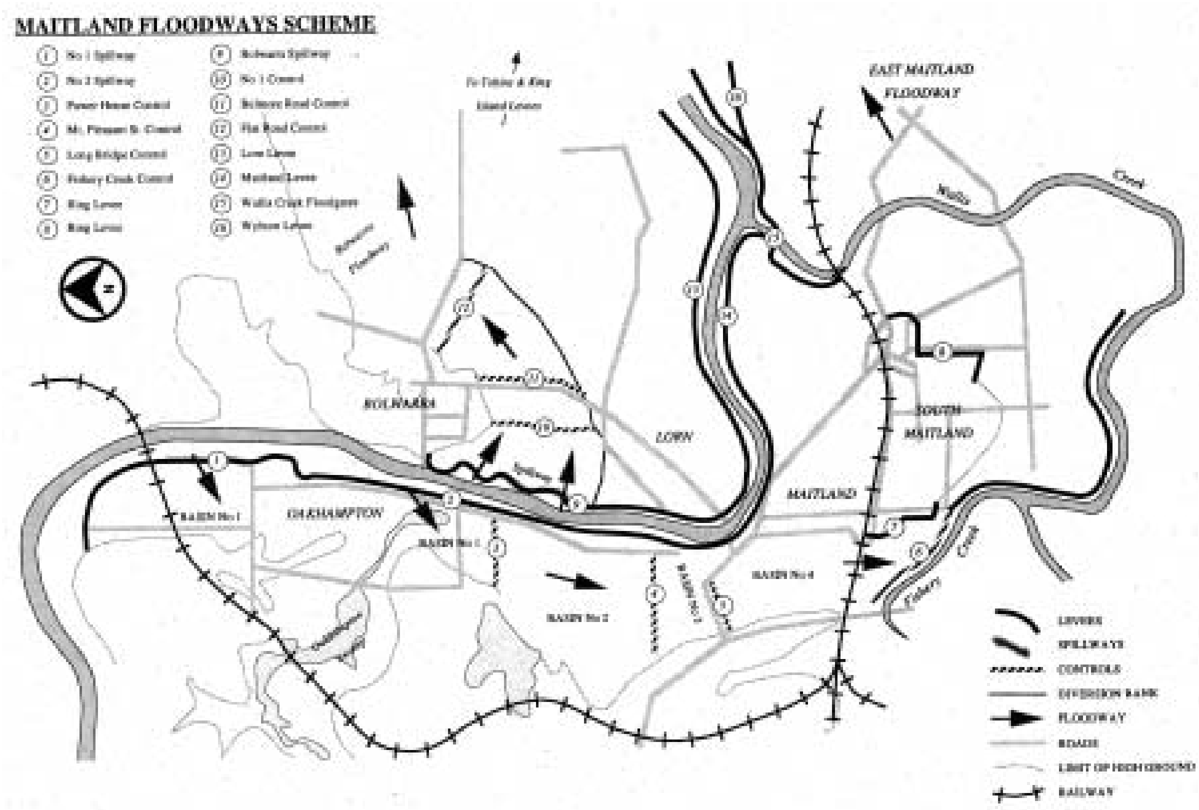
4.3 The Impact & Management of FLOODING IN MAITLAND



The predicted path of floodwaters

① During a high magnitude flood (1-in-20 year event or greater), over half of the total flow upstream of Maitland is directed into the Oakhampton and Bolwarra floodways, with the remainder being contained within the river.

② The first overtopping occurs at Oakhampton Spillway (No.1) and the floodwaters start to fill Basin No.1.

③ As the flood rises further, the next two spillways are also overtopped (Oakhampton No.2 and Bolwarra). At the same time, the inflow commences at the downstream ends of each floodway (i.e. over Wyburns Levee and over Tobins and King Island Levees).

④ As the flood continues to rise the Powerhouse Control is overtopped. Control No.1 and Belmore Road control are also submerged.

⑤ The flooding continues establishing a floodway through Bolwarra and the flow from the lower end (back from Tobins and King Island Levees) discharges back into the Hunter River over the lower levees.

⑥ Mt. Pleasant Control is overtopped and very shortly afterwards so is the Long Bridge Control and then Basin No.3.

⑦ As the flood rises even higher the areas covered increase until the whole floodplain, with the exception of Lorn and Maitland, is submerged.

All this can take as little as twelve hours in a rapid rise flood.

Reference

This information has been taken from Public Works Department (NSW) 1994, *Lower Hunter Flood Mitigation Scheme* (compilation of fact sheets).

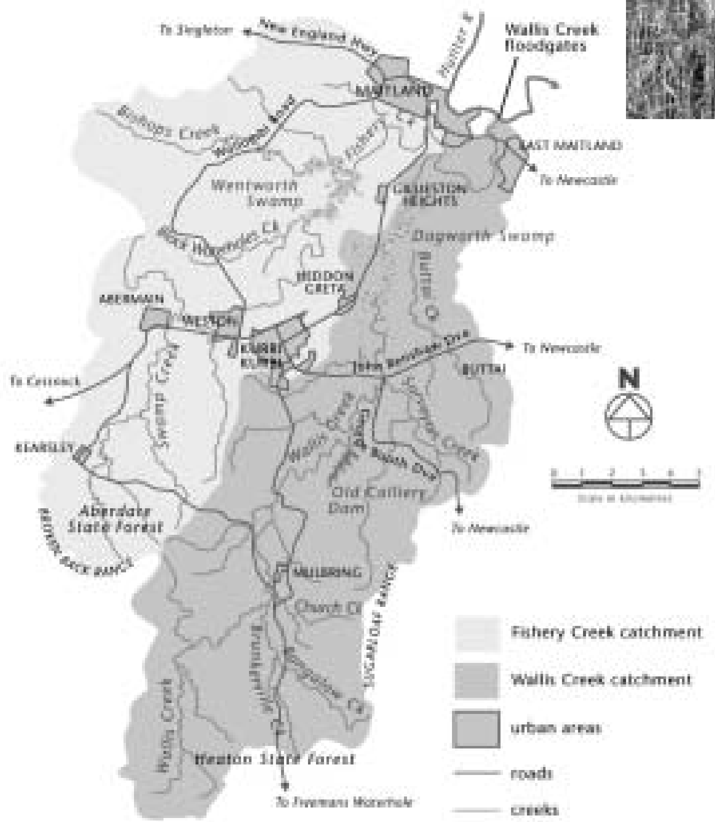
Case Study C

4.4 Catchment Management of WALLIS & FISHERY CREEKS

A catchment description

The catchment of Wallis and Fishery Creeks is inland from Newcastle near Maitland. The catchments of the two creeks are adjacent to each other and drain into the Hunter River about 3 kilometres downstream of Maitland (see map).

The Wallis Creek catchment has an area of 21,100 hectares. The Fishery Creek catchment has an area of 19,300 hectares. The majority of the catchment lies within the Cessnock Local Government Area, with 19.3% of the combined catchment within the Maitland local government area.



Map of Wallis and Fishery Creek catchments

Land use in the catchment

The existing land uses within Wallis and Fishery Creeks' catchment have evolved due to two main factors:

- the natural features of the area; and
- the availability of water.

These two factors have been the main influence on historical land use, which is reflected by the pattern of development within both catchments.

The growing residential area around Rathluba Lagoon is placing pressure on the waterway.

Coal resources and associated mining activities were the drivers for the major land uses within the Fishery Creek catchment. The poor soils of the dry sclerophyll forest that formerly covered the catchment and the ephemeral nature of the creeks, made this area less attractive to agriculture.

Development and settlement within the Fishery Creek catchment was initiated by the surveying of the Greta Coal Seam. The relatively shallow depth to the coal resources led to the opening of numerous mines. Settlements started close to the mines. These areas grew to form villages, and later towns. Due to the need for water, the villages were based along the banks of Fishery Creek.

The current pattern of urban development is characterised by the villages of Abermain, Weston, Loxford and Kurri Kurri. In many cases, development is located too close to the creek (e.g. Abermain and Weston).

Case Study C

4.4 Catchment Management of WALLIS & FISHERY CREEKS

Land use in the catchment (cont.)

Similarly, historical land uses within the Wallis Creek catchment expanded due to the availability of water for agriculture. Historically, land use within the catchment was linked to the settlement of Maitland, which dates from 1818 when European settlers took up land grants along the banks of the Hunter River.

A SUMMARY OF CATCHMENT LAND USE TODAY

* Bushland and forests	48.7%
* Grazing	37.2%
* Fertilised grazing	1.6%
* Intensive cropping	1.2%
* Dams and wetlands	1.4%
* Low and medium density residential	3.8%
* Rural residential	2.2%
* Commercial and industrial	1.1%
* Other disturbed land	2.8%

Rainforest in the upper Wallis Creek.

Total Catchment Management

Total Catchment Management (TCM) recognises the water catchment as an ideal geographical unit for studying natural resource problems.

TCM brings together government authorities, community groups and individuals to tackle issues that confront the health of a catchment. It seeks to actively involve community members as 'local experts' who know about their own area, its problems and possible solutions.

TCM provides a management direction for a catchment. It encourages everybody within that catchment to consider their impacts on others and on the catchment itself. It involves the development of a strategy to achieve sustainable natural resource management.

Applying Total Catchment Management to Wallis & Fishery Creeks' catchment

Impacts on Wallis and Fishery Creeks' catchment have become more severe over the last ten years due to population growth and an associated increase in development pressure. The effects of these impacts have included:

- a decline in stream water quality;
- a reduction in the diversity of native plants and animals;
- an increase in land clearing; and
- a shift from farming to rural residential living.

Members of the local community raised these concerns with Maitland City Council, Cessnock City Council, the Hunter Catchment Management Trust, the Department of Land and Water Conservation and the Environment Protection Authority. A partnership was then created between community and government - the Wallis and Fishery Creeks TCM Committee was formed (1995).

The TCM Committee includes representatives from:

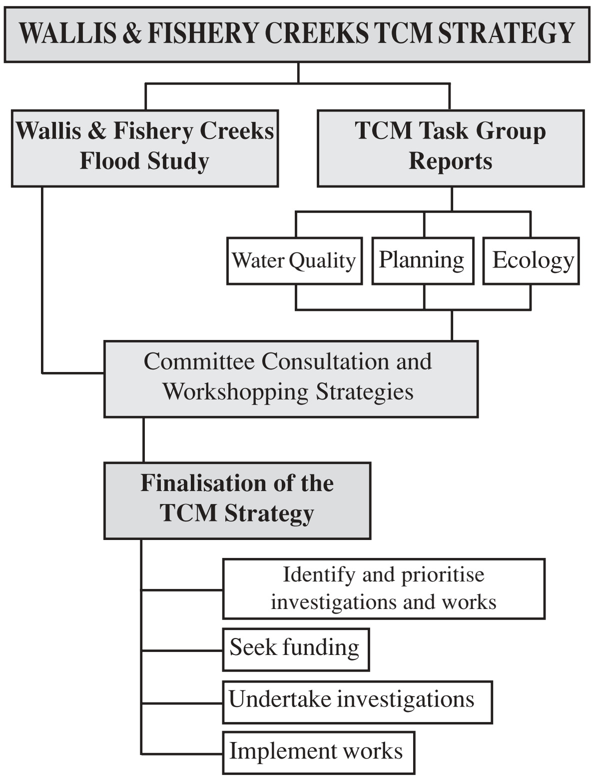
- Cessnock and Maitland City Councils,
- Department of Sustainable Natural Resources (formerly Dept. Land & Water Conservation),
- Environment Protection Authority,
- Department of Mineral Resources,
- Hunter Water Corporation,
- Hunter Catchment Management Trust,
- local industry,
- Landcare groups, and
- individual community representatives.

4.4 Catchment Management of WALLIS & FISHERY CREEKS

The role of the TCM Committee

The Committee's task was to outline a plan (TCM Strategy) to maintain and improve the health of the catchment and the quality of lifestyle that the wider community would like.

The members' roles in developing the strategy included providing information on the current status of the catchments; identifying issues of concern; and prioritising strategic actions.



The involvement of everyday local people is a vital part of the TCM Committee. Having a diversity of people and organisations working together provides opportunities for sharing different ideas and resources. It also reflects a shared responsibility for the care and management of the local environment.

Being a member on the TCM Committee wasn't the only way for local people to help create the Wallis and Fishery Creek TCM Strategy. Local people were encouraged to:

- raise issues of concern with TCM Committee members;
- join one of the Task groups where discussion of key issues and potential strategies were developed;
- make written submissions on the draft TCM Strategy;
- attend public meetings to obtain information and raise concerns.

Key issues addressed by the TCM Strategy

Degradation of Wentworth and Dagworth Swamps

These wetland areas have been drained and used as grazing land. This has disrupted the wetland's natural processes, including water filtering and providing habitat for native flora and fauna.

Declining creek water quality

There has been a growing number of pollution sources leading to cumulative impact on the waterways.

Control of the Wallis Creek floodgates

The floodgates impact on water quality and flushing of the creek. Water is often not able to flow out into the Hunter River.

Development pressures on rural land

Pressures come from both residential and industrial developments as agricultural land becomes 'sterilised' from production.

Flooding

Areas around Weston and Abermain are prone to flooding, affecting many urban residents.

Soil erosion and creek sedimentation

The soil entering the creeks eventually settles and clogs the creek, disturbing its natural behaviour.

What next?

The next stage of the TCM Strategy is one of the most important. It involves implementing the proposed actions. Those already happening include:

- completing Rivercare Plans for both creeks and working with landholders to implement them;
- protecting areas of existing native vegetation;
- encouraging the establishment of vegetation corridors in priority areas;
- fixing up areas of erosion and maintaining groundcover.

Acknowledgement & References

This case study has been prepared by Jane Young (Wallis & Fishery Creek TCM Coordinator, Hunter Catchment Management Trust). Other information sources included:

Hunter Catchment Management Trust 2000, *Wallis and Fishery Creeks Total Catchment Management Strategy*, Paterson, NSW: Hunter Catchment Management Trust.