

# Tweed Catchment and Water Quality



**The Tweed water supply catchment covers an area of more than 570 square kilometres and is entirely located within the boundary of the Tweed local government area.**

Geographically, it sits within one of the largest erosion calderas in the world, which formed following eruptions of the Mt Warning Volcano 20-23 million years ago. The catchment extends from the Nightcap Ranges in the south to the Border Ranges in the west and McPherson Ranges to the north.



*Water flowing into Clarrie Hall Dam*

The majority of this catchment is made up of rural and agricultural land uses, small residential villages, sclerophyll open forest and sub-tropical rainforest.

Tweed has an average rainfall of approximately 1600 millimetres per year.

Rain that falls within the catchment travels through forests, farms, villages and stormwater drains. As this water moves over the land, it picks up impurities and pathogens, which then need to be removed through the water treatment process.

For most of the year it is natural flows in the Tweed and Oxley Rivers that supply water for the Tweed. When required, these natural flows can be supplemented by releasing water from Clarrie Hall Dam into Doon Doon Creek, a tributary of the Tweed River.



## Clarrie Hall Dam

Clarrie Hall Dam provides storage for the Tweed's water supply. Located on Doon Doon Creek south-west of Uki, the dam took three years to construct and was completed in 1983.

Catchment area of Bray Park Weir

All raw water is extracted at Bray Park Weir, a man-made tidal barrier in the Tweed River that prevents salt water from getting into the fresh water supply. The raw water is pumped from the weir to this treatment plant and then distributed to the Tweed community. Two smaller separate networks supply water for the rural villages of Tylagum and Uki.



Clarrie Hall Dam

Clarrie Hall Dam is protected by 926 hectares of Council owned forested land and Mount Jerusalem National Park. These areas act as buffer zones helping filter run-off before it enters the dam.



Bray Park Weir



Bray Park Weir

**Type of Dam: Concrete-faced rockfill**  
**Maximum Depth: 41 metres**  
**Wall Height: 43 metres**

**Capacity: 15,000 usable megalitres, which is equivalent to 6000 full Olympic size swimming pools.**

**Comparison: Clarrie Hall Dam has a maximum capacity equal to:**

- 1.3% of the Wivenhoe Dam in Brisbane
- 4.8% of the Hinze Dam on the Gold Coast
- 0.7% of the Warragamba Dam in Sydney



*Dam Wall*

## Catchment Issues

Poor water quality in Bray Park Weir is caused by a combination of poor land-use practices in rural areas, run-off from intensive agriculture and run-off from nearby villages.

The main raw water quality risks for our drinking water supply include:

### Residential stormwater

Gutters and drains take rainwater from our streets straight into the creeks and rivers. When it rains, stormwater run-off can carry with it pollution, sediment and nutrients from around our homes, gardens and streets.

### Residential development and land clearing

More than half of the vegetation cover in the upper Tweed region has been cleared for agricultural and urban purposes. This has resulted in increased and unfiltered stormwater run-off entering our waterways, carrying excess nutrients, pollutants and sediments directly into the water.

Earthworks, unsealed gravel roads and driveways are a major contributor to the amount of sediment in this run-off, while riparian vegetation loss has also led to erosion of riverbanks.

Residential development in the catchment area can lead to increased pressure on the water supply and sewerage system (increased extractions for town water and increased effluent discharges). To minimise these impacts, Council control measures have been put in place to help encourage and enforce sustainable development.

## Rural issues

Agricultural run-off can pollute water with sediments, insecticides, herbicides and fertilisers. Other potential impacts can include surface water extraction for irrigation, groundwater extractions, on-site sewage treatment system failures and riparian (riverbank) vegetation clearing.

Contaminated rural stormwater run-off is essentially the result of agricultural and earthwork practises in the past and is the key pollution source for the upper tweed river.

Agricultural stock accessing the river bank has also led to damage and loss of riparian vegetation



*Agricultural land adjacent to river*



*Cattle in creek*



## Algal blooms and aquatic weed outbreaks

Algae and aquatic weeds can thrive in waterways when given the right combination of conditions. Excess nutrients, warm temperatures, the correct amount of light and stable water conditions (low flows, long retention times, light winds and minimal turbulence) can create the perfect conditions for such blooms.

Two significant problems encountered in the Tweed catchment are:

Blue-green algae (Cyanobacteria) blooms which can be recognised by discolouration of the water, scum on the surface and an earthy or musty odour.



*Blue-green algae in dam October 2009*



*Blue-green algae in dam October 2009*

Salvinia (*Salvinia molesta*) Outbreaks have also occurred in the still or slow flowing parts of Clarrie Hall Dam and river systems.

These outbreaks deplete oxygen levels in the water, choke waterways, prevent birds and wildlife from using the waterway, reduce fish stocks and restrict recreational activities.

During algal blooms, raw water collected for the Bray Park Water Treatment Plant must undergo additional treatment.



*Salvinia upstream of weir October 2009.*



*Salvinia at Crams Farm October 2009*

## Water Quality

Water quality in the catchment has been recorded for an extended period of time and these water quality issues have been identified:

- changes in turbidity with storm or flood-related events
- low raw water alkalinity during high turbidity events
- moderate organic content
- disinfection bi-product formation due to moderate levels of organics in the raw water
- soluble iron and manganese
- algal toxins
- taste and odour compounds

The Bray Park Water Treatment plant was designed to treat these issues and in return produce high quality drinking water for the Tweed.

