Fitzroy River System Water Quality Management

Update 20 January 2009

Introduction

This is an update of water quality in the Fitzroy River system to provide information on water quality implications and responses for a range of uses including domestic, stock, agriculture, irrigation and environmental.

Summary

Water quality has now returned to normal in the Mackenzie and Fitzroy Rivers due to storm runoff since late 2008.

Current Actions

- Heavy rains in late December resulted in Ensham mine releasing 130 ML of water from its surface storage dams, between 02 and 15 Jan 2009. This water release was suspended on 15 Jan 2009. The conductivity of water downstream of the discharge point did not exceed 500 uS/cm during the releases.

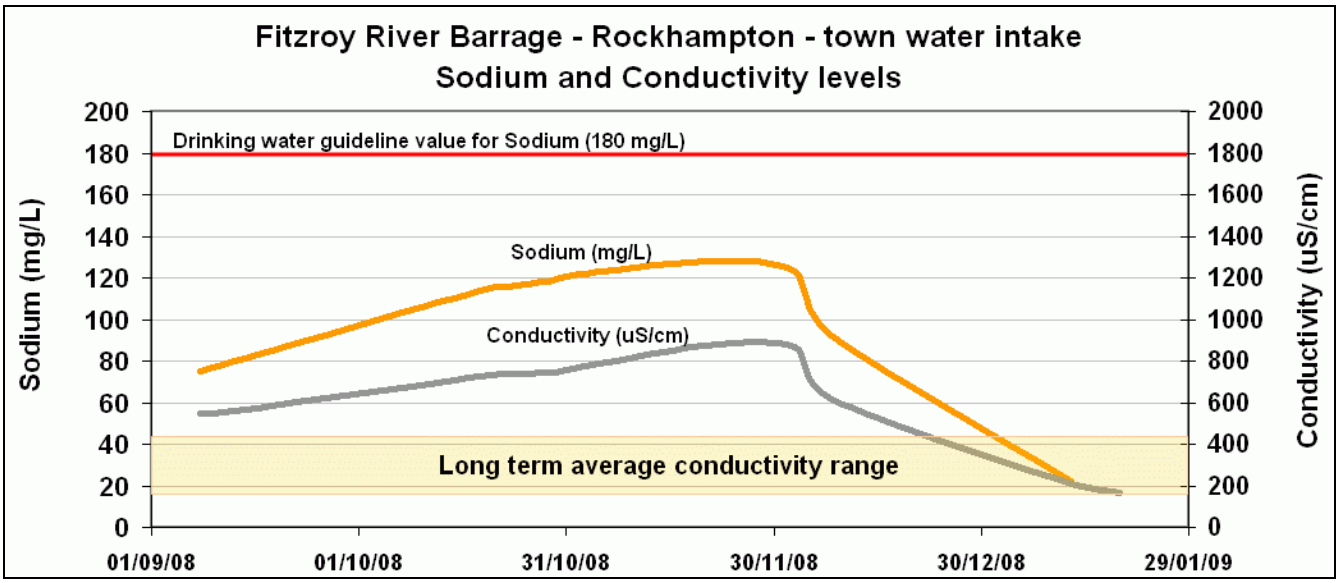
- Water conductivities in the Mackenzie and Fitzroy River systems have returned to normal levels after recent flows from storm runoff. No major changes in conductivity are expected in the short to medium term.

  Cumulative Impact Study – A draft report is now near completion and should be available for review in early February 2009.

Water Quality – lower Fitzroy River

Runoff from storms in the Nogoa, Comet, Mackenzie and Fitzroy catchments from December 2008 to the present have resulted in substantial flows in the Mackenzie and Fitzroy Rivers. These flows have flushed any remaining poor quality water from the lower Fitzroy system.

Sodium concentrations and water conductivities in the Fitzroy River Barrage have decreased significantly during the last month and have now returned to long term average levels. On 12 January 2009 the concentration of sodium in the barrage near the Rockhampton raw water intake was 22 mg/L. The fluctuation of sodium and conductivity values for water in the Fitzroy River Barrage during the last 4 months is shown in the following chart.



Sodium levels in Rockhampton treated tap water have consistently remained below the 180 mg/L guideline value and have been below 50 mg/L since 01 Jan 2009.

Storage and River Flow Summary

Since November 2008 there have been a number of runoff events as a result of storm rain in the Nogoa, Comet, Mackenzie and Fitzroy River catchments. Total flow volumes for the period 01 November 2008 to 20 January 2009 are given in table below.

Date	Total Volume (ML)						
	Comet River	Mackenzie River		Isaac River	Mackenzie River	Fitzroy River	
	Comet Weir	Riley's Crossing	Bingegang	Yatton	Coolmaringa	Riverslea	The Gap
01 Nov 2008 to 24 Dec 2008	18,513	24,696	63,187	14,765	98,918	122,301	123,562
25 Dec 2008 to 20 Jan 2009	114,511	122,195	171,718	6,250	214,637	232,239	235,752
Total	133,024	146,891	234,904	21,014	313,555	354,540	359,314

The capacity of storages as at 20 January 2009:

Storage	Current Capacity (ML)		Full Capacity
	Percentage	Volume in Storage	
Fairbairn Dam	86%	1,123,000	1,301,000
Bedford Weir	78%	17,800	22,900
Bingegang Weir	100%	8,060	8,060
Tartrus Weir	100%	12,000	12,000
Eden Bann Weir	100%	35,900	35,900
Fitzroy River Barrage	100%	81,300	81,300

River flow information is available at:
http://www.derm.qld.gov.au/water/monitoring/current_data/map_details.php?group=fitzroy
http://www.bom.gov.au/hydro/flood/qld/
http://sunwater.com.au

Salinity and Sodium Levels Summary

Salinity levels can be measured by electrical conductivity, expressed as micro-Siemens per cm (µS/cm). The salinity levels in the weirs and waterholes in the Mackenzie and Fitzroy Rivers have reduced to normal levels. Salinity levels in the Mackenzie River, from Bedford Weir to Tartrus Weir, are generally around 100 to 300 µS/cm.

Sodium concentrations are expressed as milligrams per litre (mg/L). On 12 January 2009 sodium levels in the Fitzroy River Barrage were about 22 mg/L. Sodium levels in the water supplies of Blackwater and Tieri were 67 and 135 mg/L respectively on 18 Dec 2008. While there are no recent data available for regional centres it is expected that sodium concentrations for Blackwater, Bluff, Tieri, Middlemount and Dysart bulk water supplies are very low given the water conductivity is very low.

More detailed information on salinity and sodium levels are provided in the attached table.

Human Health Summary - Queensland Health Update

Since August 2008, Queensland Health has been working with local government and other agencies to ensure regular monitoring of a range of substances.

At the affected communities of Blackwater, Tieri, Middlemount and Dysart, reticulated town water has been regularly tested for the following indicators: conductivity, pH, total hardness, alkalinity, dissolved ions, silica, colour and turbidity, sodium, potassium, calcium, magnesium, bicarbonate, carbonate, hydroxide, chloride, fluoride, nitrate, sulphate, iron, manganese, zinc, aluminium, boron, copper, cadmium, chromium, nickel, mercury, arsenic, and lead.

Sodium was the only substance that was consistently elevated above the level recommended in the Australian Drinking Water Guidelines (produced by the National Health and Medical Research Council).

Sodium levels in drinking water have been reducing since October/November 2008. Levels of sodium at Blackwater, Tieri, Dysart and Middlemount have been below the Australian Drinking Water Guideline value of 180mg/L since late November and continue to fall. In these communities, Queensland Health removed all previous advisories regarding water consumption, in December 2008.

On a small number of occasions, concentrations of aluminium and iron in untreated water were mildly elevated. Water treatment processes generally remove these substances to acceptable concentrations in the reticulated supply. However, on a small number of occasions, aluminium was present in reticulated water at levels very slightly above the Australian Drinking Water Guideline value for aluminium of 0.1mg/L. The levels present may have affected the aesthetic quality of the water but were not harmful to human health. Some physical characteristics of the water, such as conductivity, were affected by the raised sodium levels. For all other substances listed, levels in the drinking water were well below Australian Drinking Water Guideline values, and were mostly below levels of laboratory detection.

The drinking water was also tested for the following substances: polycyclic aromatic hydrocarbons, radiological parameters, and bisphenol A (a so-called “endocrine disrupting” substance). For each of these substances, results were well below Australian Drinking Water Guideline values.

The fact sheet that was relevant when sodium levels were elevated is available at <http://www.health.qld.gov.au/ph/Documents/caphs/centralhighlandsfs.pdf>.

Bluff township Water Quality issues

The Central Highlands Regional Council on 16 January 2009 in a media release advised that *E. coli* bacteria was no longer present in the Bluff reservoir and reticulated system and the boiled water alert has been removed. Earlier media releases from the CHRC had advised residents of elevated *E. coli* numbers and to boil water prior to use. Advice from all concerned parties is that this water quality issue is not directly related to past or recent coal mine water releases.

Stock and Agriculture Summary

Salinity levels are now at or below the long term average value for the Mackenzie and Fitzroy Rivers. Therefore, there are currently no water quality issues for stock and agricultural use of water from the Mackenzie and Fitzroy Rivers. Fact sheets relating to stock and agricultural water quality can be found via the links below.

Fact sheets:
http://www.dpi.nsw.gov.au/__data/assets/pdf_file/0009/96273/water-requirements-for-sheep-and-cattle.pdf
http://www.dpi.nsw.gov.au/agriculture/livestock/beef/feed/publications/livestock-water-quality-tests

Additional Information

If you have specific concerns please use these contacts:

Human Health Issues	Contact Queensland Health on ph: (07) 4920 6989
River Water Quality	Contact the EPA's Freshwater and Marine Sciences group on (07) 3896 9241
Stream Flow	Contact NRW on ph: (07) 4938 4951 (Peter Voltz)
Water Management	Contact NRW on ph: (07) 4938 4595 (Kerry Marler)
Water / Soil Irrigation Suitability	Contact NRW on ph: (07) 4938 4246 (Bruce Forster)
Primary Production Issues	Contact DPI&F on Freecall 13 25 23 or www.dpi.qld.gov.au
Town Water Supply Issues	Contact your regional council office: Central Highlands Regional Council – (07) 4982 8333 Fitzroy River Water – 1300 225 577 Isaac Regional Council – (07) 4964 5403

Current Water Quality Information

Summary Guideline values and current Water Quality information for the Fitzroy region are given in the tables below.

These tables have been developed particularly for the Fitzroy river system and provide a summary of the standards, guidelines and thresholds that define the status report in each case.

	DARK GREEN Normal levels	**LIGHT GREEN** Above normal but not exceeding any alert threshold levels	**YELLOW** Early Alert for a particular reason	**ORANGE** Approaching guideline or threshold levels	**RED** Guideline or threshold levels exceeded
Environment Fitzroy Central (most of the Fitzroy Basin)	< 340 µS/cm		340 – 510 µS/cm		> 510 µS/cm
Stock		No adverse impacts on animals expected, although animals may show an initial preference for water from a different source. Beef cattle < 6000 µS/cm Pigs < 6000 µS/cm Dairy cattle < 3700 µS/cm Poultry < 3000 µS/cm Sheep < 7500 µS/cm	Animals may have initial reluctance to drink or there may be some scouring but stock should adapt without loss of production. Beef Cattle 6000 - 7500 µS/cm Pigs 6000 - 9000 µS/cm Dairy Cattle 3700 - 6000 µS/cm Poultry 3000 – 4500 µS/cm Sheep 7500 – 15000 µS/cm		Loss of production and a decline in animal condition and health would be expected. Beef Cattle > 7500 µS/cm Pigs > 9000 µS/cm Dairy Cattle > 6000 µS/cm Poultry > 4500 µS/cm Sheep > 15000 µS/cm
Agriculture / Irrigation / domestic gardens	Suitable for all plants <650 µS/cm	Suitable for the majority of plants 650 -1300 µS/cm	Suitable for plants tolerant to medium levels of salinity 1300 - 3000 µS/cm	Suitable for very tolerant plants only. 3000 - 5000 µS/cm	Generally too saline for all plants >5000 µS/cm

References for guideline values:

Queensland Water Quality Guidelines 2006, Appendix G
Salinity Management Handbook (1997) ISBN072427412X
Australian & New Zealand Guidelines for Fresh & Marine Water Quality, 2000
DPI&F Note.

Update 20 January 2009 – detailed Fitzroy River water quality information

SITE	Sample Date (Previous / Latest)	Test Results (previous / latest) EC (µS/cm)	What this means for: Stock	Agriculture	Environment
Weirs					
Bedford Weir (200m upstream near surface)	08 Dec / 14 Jan	300 / 177	Normal levels	Normal levels	Normal levels
Bingegang Weir (down stream of weir)	09 Dec / 14 Jan	350 / 182	Normal levels	Normal levels	Normal levels
Tartrus Weir (down stream of weir)	04 Dec / 14 Jan	363 / 179	Normal levels	Normal levels	Normal levels
Eden Bann Weir (down stream of weir)	10 Dec / 14 Jan	910 / 145	Normal levels	Normal levels	Normal levels
Fitzroy Barrage (Town Water Supply intake near surface)	15 Dec / 20 Jan	801 / 183	Normal levels	Normal levels	Normal levels
NRW Gauging Stations					
Yatton (Isaacs R)	13 Dec / 20 Jan	263 / 231	Normal levels	Normal levels	Normal levels
Coolmaringa (Mackenzie R)	15 Dec / 20 Jan	348 / 189	Normal levels	Normal levels	Normal levels
The Gap-Eden Bann Weir (Fitzroy R)	15 Dec / 20 Jan	843 / 221	Normal levels	Normal levels	Normal levels

Town Water Supplies		**Sodium (mg/L)**	
Note: While there are no recent sodium values available for regional centres the concentration of sodium at all sites is expected to be low due to low water conductivities. For example, based on recent data, conductivities of 200 to 300 µS /cm are expected to result in sodium concentrations of about 25 to 40 mg/L respectively.			
Tieri	10 Dec / 18 Dec	142 / 135	For details refer to Queensland Health fact sheets http://www.health.qld.gov.au/ph/Documents/caphs/centralhighlandsfs.pdf
Blackwater	10 Dec / 18 Dec	98 / 67	
Dysart	26 Nov / 05 Dec	177 167	
Middlemount	27 Nov / 11 Dec	172 / 76	
Rockhampton	08 Dec / 12 Jan	93 / 22	

Note:

1. This is indicative/selected information to provide a snap shot of the possible impacts on the river system and water users. More detailed information is available if required. Please contact EPA 1300 130 372 (press 2 when prompted) in the first instance to find out what additional information is available and how it can be accessed.
2. The Fitzroy River website at <www.fitzroyriver.qld.gov.au/waterquality/index.html> has information on implications for water quality and responses for domestic, stock, agriculture and irrigation uses.