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Broken Hill Drinking Water Quality Report

1 January 2010 to 31 December 2010

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1 January 2010 to 31 December 2010 – Drinking Water Quality Report

Essential Water produces this report to inform Essential Water customers about their water quality. Water quality testing and monitoring occurs during various stages of the storage and distribution system to ensure that water guidelines are met.

Essential Water's assessment, based on our water quality test results for this period, indicates that drinking water quality has complied with the health and aesthetic values in the Australian Drinking Water Guidelines (ADWG) 2004.

The ADWG 2004 recognise that occasionally there may be health or aesthetic related test results that fall outside the guidelines and that these results are not necessarily an immediate threat to health. The guidelines do not require a 100% results in all cases. All test results above the guidelines are investigated and actions, if necessary, taken.

For more information please call in and see us at out Customer Service Centre, contact us on **13 23 91** or visit **www.essentialwater.com.au**

What is our aim?

Essential Water is committed to providing safe, secure, reliable and high quality water to our customers.

How do we test water quality?

Water samples are taken from 38 locations including the reservoirs, at the inlet and outlet of the water filtration plants, and from various other locations throughout out water network. Independent laboratories certified to the National Association of Testing Authorities (NATA) standards carry out all testing, and the results are reviewed by NSW Health.

In the attached table you will find a summary of the test results for samples collected from the Broken Hill Water Treatment Plant and locations throughout our network over the reporting period (1 January 2010 to 31 December 2010).

What is tested?

Your water is tested for up to 70 different characteristics including taste, colour, odour, micro-organisms and chemical content. This report is a summary of a selection of the health characteristics, chosen in consultation with NSW Health and aesthetic characteristics.

What are the water guidelines we must meet?

Australian Drinking Water Guidelines (ADWG) 2004 is set by the National Health and Medical Research Council (NHMRC) and the Agriculture & Resource Management Council of Australia and New Zealand (ARMCANZ).

The role of Essential Water is to ensure that safe drinking water is supplied to meet all guidelines.

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Table 1: Broken Hill annual drinking water and raw water quality report 1 January 2010 to 31 December 2010

BROKEN HILL		Filtered Water *						
Characteristics		**No. Samples**	**Min**	**Avg**	**Max**	**ADWG**	**% Passed**	**Comply**
Health	**E. coli**	117	0	0	0	0 orgs / 100 mL (98%)	100%	✓
	Fluoride**	12	0.12	0.483	0.97	0.9 to 1.5 mg/L (95%)	100%	✓
	Free Chlorine	107	0.5	1.572	2.99	<5 mg/L (95%)	100%	✓
	Lead	12	0.001	0.001	0.001	<0.01 mg/L (95%)	100%	✓
	Arsenic	12	0.0005	0.0008	0.001	<0.007 mg/L (95%)	100%	✓
	Manganese	12	0.0025	0.003	0.008	<0.1 mg/L (95%)	100%	✓
	Cadmium	12	0.00025	0.00025	0.00025	<0.002 mg/L (95%)	100%	✓
	Copper	12	0.0025	0.0108	0.036	<2 mg/L (95%)	100%	✓
	Mercury	12	0.00005	0.0001	0.0001	<0.001 mg/L (95%)	100%	✓
	Trihalomethanes	13	0.029	0.063	0.123	<0.25 mg/L (95%)	100%	✓
Aesthetic	**Turbidity**	12	0.05	0.1667	0.3	< 5 NTU (95%)	100%	✓
	True Colour	12	0.5	0.75	1	< 15 HU (95%)	100%	✓
	pH	12	7.2	7.658	8	6.5-8.5 pH (95%)	100%	✓
	EC	25	292	349.88	677	<1000 µS/cm	100%	✓
	Zinc	12	0.005	0.0071	0.02	< 3 mg/L (95%)	100%	✓
	Iron	12	0.005	0.0063	0.01	<0.3 mg/L (95%)	100%	✓

* Australian Drinking Water Guidelines 2004. Filtered Water is defined as the water leaving the Water Treatment Plant.
** Low fluoride readings are not classed as health exceedances.

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1 Glossary*

Australian Drinking Water Guidelines (ADWG) – Are intended to provide a framework for good management of drinking water supplies that, if implemented, will assure safety at point of use. The ADWG are designed to provide an authoritative reference on what defines safe, good quality water, how it can be achieved and how it can be assured. The ADWG are not mandatory standards, however they provide a basis for determining the quality of water supplied to customers in all parts of Australia. The ADWG are set by the National Health and Medical Research Council (NHMRC) and the Natural Resource Management Ministerial Council (NRMMC).

Health-related guideline value - which is the concentration or measure of a water quality characteristic that, based on present knowledge, does not result in any significant risk to the health of the consumer over a lifetime of consumption;

Aesthetic guideline value - which is the concentration or measure of a water quality characteristic that is associated with acceptability of water to the consumer; for example, appearance, taste and odour.

Arsenic – From natural sources and mining, industrial and agricultural wastes. The health guideline value for arsenic is 0.007 mg/L.

Cadmium – Indicates industrial or agricultural contamination; from impurities in galvanised (zinc) fittings, solders and brasses. The health guideline value for cadmium is <0.002 mg/L.

Chlorine – Widely used to disinfect water, and this can produce (free) chlorinated organic by-products. Odour thresholds generally 0.6 mg/L, but 0.2 mg/L for a few people. In some supplies it may be necessary to exceed the aesthetic guideline in order to maintain an effective disinfectant residual throughout the system. The health guideline value to chlorine is 5 mg/L and the aesthetic guideline value is 0.6 mg/L.

Copper – From corrosion of pipes/fittings by salt, low pH water. Taste threshold 3 mg/L. High concentrations colour water blue/green. >1 mg/L may stain fittings. > 2 mg/L may cause ill effects in some people. The health guideline value for copper is <2 mg/L and the aesthetic guideline value is <1 mg/L.

E. coli – is a type of thermotolerant coliform bacteria, and is nearly always present in the gut of humans and other warm-blooded animals. E coli is now generally regarded as the most specific indicator of faecal contamination, and therefore the more important indicator for public health. At least 98% of scheduled samples (as distinct from repeat or special purpose samples) should contain no E. coli or thermotolerant coliforms. E. coli is measured in organisms per 100 mL.

Electrical Conductivity (EC) - is a measure of salinity. Electricity is conducted with increased ease as the concentration of dissolved salt in the water increases. Therefore, a high electrical conductivity indicated a high salt concentration of salt. It is measured in microSiemens per centimetre (µS/cm).

Fluoride – Occurs naturally in some water from fluoride-containing rocks. Often added at up to 1 mg/L to protect against dental cavities. >1.5 mg/L can cause dental fluorosis. > 4 mg/L can cause skeletal fluorosis. The health guideline value is <1.5 mg/L.

Iron – Occurs naturally in water, usually at <1 mg/L, but up to 100 mg/L in oxygen-depleted groundwater. Taste threshold is 0.3 mg/L. High concentrations stain laundry and fittings. Iron bacteria cause blockages, taste/odour and corrosion. The aesthetic guideline for iron is <0.3 mg/L.

Lead - Occurs in water via dissolution from natural sources or household plumbing containing lead (e.g pipes or solder). The health guideline value for lead is <0.01 mg/L.

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Manganese - Occurs naturally in water; low in surface water, higher in oxygen depleted water (e.g groundwater at the bottom of deep storages). >0.1 mg/L causes taste and staining, <0.05 mg/L is desirable. The health guideline value is <0.5 mg/L and the aesthetic guideline value for manganese is <0.1 mg/L.

Maximum – The highest recorded reading.

Minimum – The lowest recorded reading.

Mercury - From industrial emissions/spills. Very low concentrations occur naturally. Organic forms most toxic, but these are associated with biota, not water. The health guideline value for mercury is <0.001 mg/L.

pH - While pH values (< 4 and > 11) may adversely affect health, there is insufficient data to set a health guideline value. < 6.5 may be corrosive. > 8 progressively decreases efficiency of chlorination. > 8.5 may cause taste and odour problems. New concrete tanks and cement-mortar lined pipes can significantly increase pH and a value up to 9.2 may be tolerated provided monitoring indicates no deterioration in microbial quality. The aesthetic guideline range for pH is 6.5 – 8.5.

Reservoir – An artificial body of water.

Trihalomethanes (THMs) - A byproduct of chlorination and chloramination. The health guideline value for trihalomethanes is <0.25 mg/L.

True Colour – 15 HU is just noticeable in a glass. Up to 25 HU is acceptable if turbidity is low. If colour is high at time of disinfection, then the water should be checked for disinfection byproducts such as THMs. The aesthetic guideline value for true colour is 15 HU.

Turbidity – 5 NTU is just noticeable in a glass. >1 NTU may shield some microorganisms from disinfection.<1 NTU is desirable for effective disinfection. The aesthetic guideline for turbidity is 5 NTU.

Zinc – Usually from corrosion of galvanised pipes/fittings and brasses. Natural concentrations are generally <0.01 mg/L. Taste problems can occur at >3 mg/L. The aesthetic guideline for zinc is 3 mg/L.

**Glossary definitions adapted from ADWG (2004)*