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Prepared for Queensland Water Supply Regulator, Department of Energy and Water Supply

Public Report

Chinchilla Beneficial Use Scheme Water Quality Report 01 January - 31 March 2015

Date: April 2015

Project: P-ASWP-0036-AA-01 **File No:** 13-005745/001



Table of Contents

1.	Sum	mary									
2.	Intro	oduction									
3.	Ken	Kenya Water Treatment Facility Description									
	3.1	Aggregation and Feed Ponds									
	3.2	Ultrafiltration									
	3.3	Ion Exchange									
	3.4	Reverse Osmosis									
	3.5	Conditioning									
4.	Арр	rovals									
5.	Water Quality Monitoring										
	5.1	External Water Quality Monitoring									
	5.2	Treated Water Testing Results									
	5.3	Non Compliances									
6.	Abb	reviations and Acronyms10									
List	of F	igures									
Figur	e 1:	Chinchilla Reuse Scheme Overview									
List	of T	ables and the second se									
Table		01 January to 31 March 2015 Treated Water Monitoring Results Summary									
Tuble	. 1.	or January to 31 March 2013 Freuted Water Montoring Results Sammary									
List	of F	Photographs									
Photo	o 1:	Kenya to Chinchilla Weir Pipeline Outfall									

List of Appendices

APPENDIX A: Summary of Weekly and Quarterly Treated CSG Water Quality Monitoring



1. Summary

The Chinchilla Beneficial Use Scheme involves the use of coal seam gas (CSG) water that has been treated at the Kenya Water Treatment Plant (WTP). The overall scheme and pipeline component are managed by SunWater, while the treatment plant operation is managed by QGC Pty Ltd.

SunWater is a bulk water infrastructure developer and manager, playing a key role in Australia's water industry, owning and managing around \$7 billion in water infrastructure assets, and supplying approximately 40% of all water used commercially in Queensland.

The Chinchilla Beneficial Use Scheme involves the release of treated water into the Chinchilla Weir, mainly for use by irrigators. The release of treated water into Chinchilla Weir is regulated under the approved Interim Recycled Water Management Plan (RWMP), which commenced 18 July 2013. The conditions of the approved interim RWMP require the release of quarterly reports covering the water quality analysis. The interim RWMP is administered by the Queensland Water Supply Regulator (QWSR).

The Electricity and Other Legislation Amendment Act 2014 commenced on 01 July 2014 by proclamation. In line with section 669 (2) of the Electricity and Other Legislation Amendment Act 2014, the interim plan continues in effect under the pre-amended Act until the earlier of the following:

- (a) The specific approval of a resource for beneficial use (ENBU02701811) is amended to include public health conditions that are consistent with the interim plan;
- (b) 01 July 2015.

This report presents a summary of the available water quality monitoring results obtained during the 1st Quarter of 2015 for the Chinchilla Beneficial Use Scheme. It covers the period 01 January to 31 March 2015.

During the 1st Quarter of 2015, all confirmed results were within the limits stipulated in the RWMP, with no non compliant results from this monitoring period reported to QWSR.

This report has been produced in accordance with the 'Public Reporting Guideline for Recycled Water Schemes' (DEWS 2011) and the Water Supply (Safety and Reliability) Act 2008 (the Act).

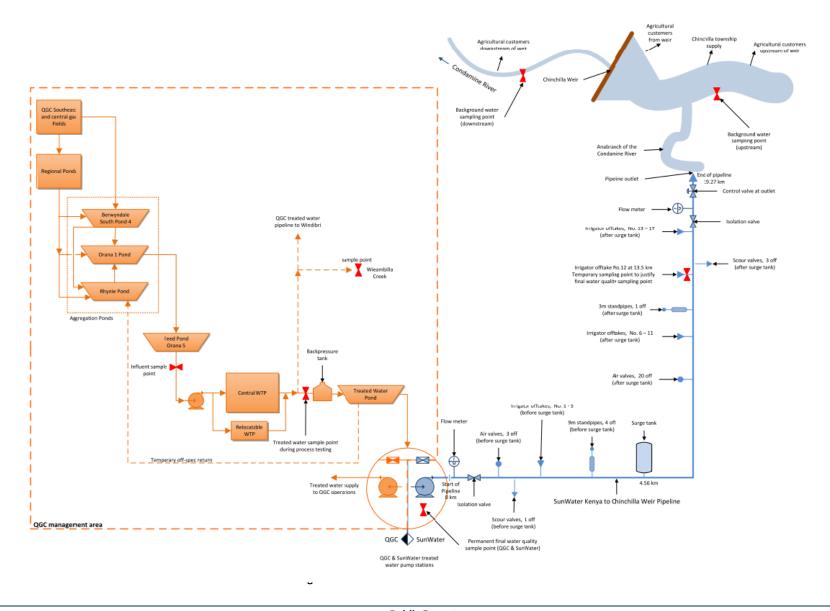


2. Introduction

During the process of CSG extraction, groundwater is released as a by-product, known as CSG water. The quality and quantity of CSG water released through the gas extraction process varies over time and according to the unique geological attributes of a given area. The CSG water quality is generally low, with limited applications for its direct use. To ensure this resource can be beneficially used, the CSG water is treated to a standard suitable for irrigation, stock watering and augmentation of drinking water supplies. The WTP treats the CSG water to a high standard as per the interim RWMP, through a multi-stage robust treatment process, as detailed in Section 3.

The Kenya WTP and the Kenya to Chinchilla Pipeline produce and deliver treated CSG water to agricultural customers for beneficial use as part of the Chinchilla Beneficial Use Scheme. Beneficial use of the treated CSG water occurs along the Kenya to Chinchilla pipeline and within the existing Chinchilla Weir Water Supply Scheme by two groups of customers; agricultural use (irrigation and stock watering); and augmentation of the water supply for the Chinchilla township. The majority of the treated CSG water is used beneficially by irrigators for crop production. Refer to Figure 1 for an overview of the Scheme.







The water is distributed to customers in a manner that ensures it does not pass beyond the boundaries of the scheme, meaning that the Chinchilla Beneficial Use Scheme is operated in a way that preserves and protects the existing cultural and economic values of the receiving environment. The majority of CSG water customers extract water from the Chinchilla Weir. Discharge to the Chinchilla Weir is via the approved discharge point under the RWMP, while monitoring occurs at both the WTP outlet (at the Treated Water Pump Station) and prior to discharge into the Chinchilla Weir.



Photo 1: Kenya to Chinchilla Weir Pipeline Outfall

To ensure the quality of the water provided to SunWater is consistently of a standard that protects public health and safety, water quality samples are taken weekly and sent to NATA accredited laboratory for independent analysis and reporting. The suite of analytes monitored in each sample are in accordance with the conditions of the RWMP, which groups analytes into weekly, quarterly and annual monitoring requirements.

This report summarises the results of the weekly and quarterly monitoring conducted during the period 01 January to 31 March 2015. SunWater is presenting this information in a format consistent with the Interim RWMP requirements to provide transparency in its operations and providing the community of the Western Downs with relevant information.

This report will be made publically available and can be viewed and downloaded from the <u>SunWater</u> <u>website</u>. Any further queries relating to this report can be made by calling 13 15 89.



3. Kenya Water Treatment Facility Description

The Kenya WTP utilises a multiple barrier treatment process including Ultrafiltration (UF), Ion Exchange (IX) and Reverse Osmosis (RO). These steps ensure that the water can safely and reliably be produced to a quality suitable for discharge into the Chinchilla Weir. Key steps used in the treatment process include:

- Aggregation and Feed Ponds
- Ultrafiltration
- Ion Exchange
- Reverse Osmosis
- Conditioning

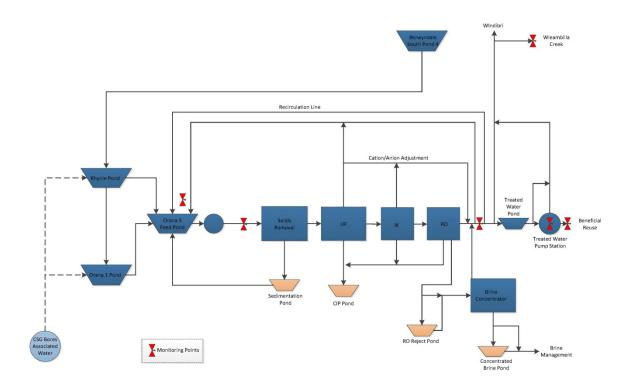


Figure 2: Kenya Water Treatment Plant

3.1 Aggregation and Feed Ponds

The water extracted during the CSG extraction process is stored in aggregation ponds before being delivered to the feed pond prior to the Kenya WTP. As all storage ponds are exposed to their surrounding environment, the water is susceptible to the natural effects of evaporation, sunlight, the atmosphere and rainwater, potentially altering its characteristics.



3.2 Ultrafiltration

Before being fed to the Ultrafiltration units, the water passes through disc filters to remove large solids and all other contaminants which could cause irreversible fouling to downstream water treatment processes, excessive frequency of cleaning, or premature degradation of the RO membranes. The water may also be dosed with additives to prevent bio fouling, scaling and aid in coagulation.

The Ultrafiltration units remove all particulate material, utilising a hollow fibre membrane with ultrafine pores.

3.3 Ion Exchange

The Ion Exchange process removes divalent and trivalent metal ions, such as calcium and magnesium.

3.4 Reverse Osmosis

Water is passed at high pressure through fine membranes. This removes most of the dissolved salts and other trace elements.

3.5 Conditioning

Prior to entering the treated water pond, the pH of the treated CSG water is adjusted to meet stipulated approval limits (6.5 to 8.5 pH units). At this stage calcium and magnesium are added to adjust the Sodium Absorption Ratio (SAR) within stipulated approval limits. This is done in accordance with the Beneficial Use Approval (environmental protection requirements) and to ensure the suitability with intended reuse objectives.

4. Approvals

In order to discharge into the Chinchilla Weir, SunWater have secured two separate approvals. A notice of approval of a resource for beneficial use (ENBU02701811) was granted on 01 August 2011. This approval is managed under the Queensland Governments Department of Environment and Heritage Protection (DEHP). The Beneficial Use Approval is in place to ensure that the water is appropriately reused and carefully managed to minimise any risk of environmental harm.

On 18 July 2013 SunWater, as Scheme Manager for the multiple-entity Chinchilla Beneficial Use Scheme was issued an approval from the Department of Energy and Water Supply for its interim Recycled Water Management Plan. The Electricity and Other Legislation Amendment Act 2014 commenced on 01 July 2014 by proclamation. In line with section 669 (2) of the Electricity and Other Legislation Amendment Act 2014 the interim plan continues in effect under the pre-amended Act until the earlier of the following:

- (a) The specific approval of a resource for beneficial use (ENBU02701811) is amended to include public health conditions that are consistent with the interim plan;
- (b) 01 July 2015.



5. Water Quality Monitoring

5.1 External Water Quality Monitoring

Treated water is sampled on a weekly and quarterly basis in the treated water pump station for the parameters stated in Table 1 of SunWater's interim RWMP approval. Each quarter, one of the weekly sampling events will test for all parameters detailed in Table 1 of the CSG interim RWMP approval, constituting a quarterly monitoring round.

During the period of this report, sampling was undertaken on the following dates:

Weekly Sampling: 05/01/2015, 12/01/2015, 19/01/2015, 27/01/2015, 02/02/2015,

09/02/2015, 16/02/2015, 23/02/2015, 02/03/2015, 09/03/2015,

17/03/2015, 23/03/2015, 30/03/2015.

Quarterly Sampling: 02/03/2015.



5.2 Treated Water Testing Results

The treated water testing results for the 01 January to 31 March 2015 reporting period are summarised in Table 1. A more detailed listing of the monitoring results is contained in Appendix A. All confirmed results were compliant with the specified limits in the interim RWMP.

Table 1: 01 January to 31 March 2015 Treated Water Monitoring Results Summary

Parameter Group	Parameter	CAS Number	Compliance with Water Quality	Water Quality	Unit	Maximum	Count of Samples	Required Testing
		rtambor	Limit	Limit			campios	Frequency
Endocrine Disrupting Compounds	Nonylphenol	25154- 52-3	100%	500	μg/L	<lor< td=""><td>1</td><td>Quarterly</td></lor<>	1	Quarterly
	Bromochloroacetonitrile	83463- 62-1	100%	0.7	μg/L	<lor< td=""><td>1</td><td>Quarterly</td></lor<>	1	Quarterly
	Bromodichloromethane	75-27-4	100%	6	μg/L	<lor< td=""><td>1</td><td>Quarterly</td></lor<>	1	Quarterly
Disinfection	Bromoform	75-25-2	100%	100	μg/L	<lor< td=""><td>1</td><td>Quarterly</td></lor<>	1	Quarterly
By-Products	Chloroform(Trichlorometha ne)	67-66-3	100%	200	μg/L	<lor< td=""><td>1</td><td>Quarterly</td></lor<>	1	Quarterly
	Dibromochloromethane (DBCM)	124-48- 1	100%	100	μg/L	<lor< td=""><td>1</td><td>Quarterly</td></lor<>	1	Quarterly
	Dichloroacetonitrile	3018- 12-0	100%	2	μg/L	<lor< td=""><td>1</td><td>Quarterly</td></lor<>	1	Quarterly
Industrial Organics	Bisphenol A	80-05-7	100%	200	μg/L	<lor< td=""><td>1</td><td>Quarterly</td></lor<>	1	Quarterly
	Bromide	24959- 67-9	100%	7000	μg/L	0.5	13	Weekly
	Cyanide - Total	57-12-5	100%	80	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
Inorganics	Fluoride	16984- 48-8	100%	1500	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
	lodide	20461- 54-5	100%	100	μg/L	0.02	13	Weekly
	Sulfate	14808- 79-8	100%	500000	μg/L	1	13	Weekly
	Aluminium - Total	7429- 90-5	100%	200	μg/L	0.054	13	Weekly
	Antimony - Total	7440- 36-0	100%	3	μg/L	<lor< td=""><td>1</td><td>Quarterly</td></lor<>	1	Quarterly
	Arsenic - Total	7440- 38-2	100%	7	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
	Barium - Total	7440- 39-3	100%	700	μg/L	0.46	13	Weekly
	Boron - Total	7440- 42-8	100%	4000	μg/L	0.48	13	Weekly
	Cadmium - Total	7440- 43-9	100%	2	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
	Chromium - Total	7440- 47-3	100%	50	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
Metals	Copper - Total	7440- 50-8	100%	2000	μg/L	0.001	13	Weekly
	Iron - Total	7439- 89-6	100%	300	μg/L	0.26	13	Weekly
	Lead - Total	7439- 92-1	100%	10	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
	Manganese - Total	7439- 96-5	100%	500	μg/L	0.043	13	Weekly
	Mercury - Total	7439- 97-6	100%	1	μg/L	0.0002	13	Weekly
	Molybdenum - Total	7439- 98-7	100%	50	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
	Nickel - Total	7440- 02-0	100%	20	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
	Selenium - Total	7440- 49-2	100%	10	μg/L	<lor< td=""><td>1</td><td>Quarterly</td></lor<>	1	Quarterly
	Silver - Total	7440-	100%	100	μg/L	<lor< td=""><td>1</td><td>Quarterly</td></lor<>	1	Quarterly



Parameter Group	Parameter	CAS Number	Compliance with Water Quality Limit	Water Quality Limit	Unit	Maximum	Count of Samples	Required Testing Frequency
	Strontium - Total	7440- 22-4	100%	4000	μg/L	0.99	13	Weekly
	Vanadium - Total	7440- 62-2	100%	50	μg/L	<lor< td=""><td>1</td><td>Quarterly</td></lor<>	1	Quarterly
	Zinc - Total	7440- 66-6	100%	3000	μg/L	0.009	13	Weekly
Nitrosamines	NDMA (n- Nitrosodimethylamine)	62-75-9	100%	0.1	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
Nutrients	Ammonia (as N) - Total	7664- 41-7	100%	900	μg/L	0.34	13	Weekly
	Benzo[a]anthracene	56-55-3			μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
	Benzo[a]pyrene	50-32-8			μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
	Benzo[b+j]fluoranthene	205-99- 2 + 205- 82-3	Limits ap	alv to	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
Polycyclic Aromatic	Benzo[k]fluoranthene	207-08- 9	summed to	otal of	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
Hydrocarbons	Chrysene (Benzo[a]phenanthrene)	218-01- 9	Concentration	X 1 2 1.	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
	Dibenzo[a,h]anthracene	53-70-3			μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
	Indeno[1,2,3-cd]pyrene	193-39- 5			μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
	PAH (as B(a)P TEF)		100%	0.01	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
	Lead-210	14255- 04-0			Bq/ L	PEN	1	Quarterly
	Polonium-210	13981- 52-7	Limits ap	oly to	Bq/ L	PEN	1	Quarterly
Radionuclides	Radium-226	7440- 14-4	summed	total.	Bq/ L	PEN	1	Quarterly
	Radium-228	15262- 20-1			Bq/ L	PEN	1	Quarterly
	Total est Radiological Dose (Gamma)		100%	0.5	mSv /yr	PEN	1	Quarterly
	C6-C9 Hydrocarbons				μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
Total	C10-C14 Hydrocarbons		Limits ap	•	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
Petroleum	C15-C28 Hydrocarbons		summed	total.	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
Hydrocarbons	C29-C36 Hydrocarbons				μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
.,	Total Petroleum Hydrocarbons		100%	200	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
	Benzene	71-43-2	100%	1	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
	Ethylbenzene	100-41- 4	100%	300	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
Volatile Organic	Meta & Para Xylenes	108-38- 3/106- 42-3	100%	600	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
Compounds	Ortho-Xylene	95-47-6	100%	600	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
	Toluene	108-88- 3	100%	800	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly
	Total Xylene	1330-		600	μg/L	<lor< td=""><td>13</td><td>Weekly</td></lor<>	13	Weekly

Note *1: The mean has been calculated by interpreting results of less than Limit of Reporting (<LOR) as zero in line with section 2.5.2 of the Public Reporting Guideline for Recycled Water Schemes.

Note *2: 'Count of positives' indicates results recorded above the detection limit.



5.3 Non Compliances

No non compliances were reported between 01 January 2015 and 31 March 2015.

6. Abbreviations and Acronyms

Term/Abbreviation/Acronym	Definition
μg	Micrograms (1 x 10 ⁻⁶ grams)
Bq	Becquerel(s)
CAS	Chemical abstracts service
CSG	Coal seam gas
DEHP	Department of Environment and Heritage Protection
DEWS	Department of Environment and Water Supply
IX	Ion exchange
L	Litre(s)
LOR	Practical limit of reporting.
mSv	Millisievert (measure of radiation dose)
NATA	National Association of Testing Authorities
ND	Not detected
NT	Not tested
рН	Power of hydrogen
QGC	Queensland Gas Company
QWSR	Queensland Water Supply Regulator
RO	Reverse Osmosis
RWMP	Recycled Water Management Plan
SAR	Sodium absorption ratio
TEF	Toxicity equivalence factor
the Act	Water Supply (Safety and Reliability) Act 2008
TPH	Total petroleum hydrocarbon(s)
UF	Ultra filtration
WTP	Water treatment plant

APPENDIX A:

Summary of Weekly and Quarterly Treated CSG Water Quality Monitoring

01 January to 31 March 2015

Parameter Group	Parameter	CAS Number	Compliance with Water Quality Limit	Water Quality Limit	Limit of Reporting (LOR)	Unit	Minimum	Mean	Maximum	Count of Samples	Count of positives	Required Testing Frequency
Endocrine Disrupting Compounds	Nonylphenol	25154- 52-3	100%	500	100	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<>	<lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<>	1	0	Quarterly
	Bromochloroacetonitrile	83463- 62-1	100%	0.7	0.1	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<>	<lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<>	1	0	Quarterly
	Bromodichloromethane	75-27-4	100%	6	0.5	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<>	<lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<>	1	0	Quarterly
Disinfection	Bromoform	75-25-2	100%	100	0.5	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<>	<lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<>	1	0	Quarterly
By-Products	Chloroform(Trichloromethane)	67-66-3	100%	200	0.5	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<>	<lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<>	1	0	Quarterly
	Dibromochloromethane (DBCM)	124-48- 1	100%	100	0.5	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<>	<lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<>	1	0	Quarterly
	Dichloroacetonitrile	3018- 12-0	100%	2	0.1	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<>	<lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<>	1	0	Quarterly
Industrial Organics	Bisphenol A	80-05-7	100%	200	20	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<>	<lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<>	1	0	Quarterly
	Bromide	24959- 67-9	100%	7000	20	μg/L	0.22	0.27	0.5	13	12	Weekly
	Cyanide - Total	57-12-5	100%	80	5	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
Inorganics	Fluoride	16984- 48-8	100%	1500	100	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
	lodide	20461- 54-5	100%	100	20	μg/L	<lor< td=""><td>0.002</td><td>0.02</td><td>13</td><td>1</td><td>Weekly</td></lor<>	0.002	0.02	13	1	Weekly
	Sulfate	14808- 79-8	100%	500000	1000	μg/L	<lor< td=""><td>0.15</td><td>1</td><td>13</td><td>2</td><td>Weekly</td></lor<>	0.15	1	13	2	Weekly
	Aluminium - Total	7429- 90-5	100%	200	5	μg/L	0.006	0.015	0.054	13	12	Weekly
	Antimony - Total	7440- 36-0	100%	3	0.1	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<>	<lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<>	1	0	Quarterly
	Arsenic - Total	7440- 38-2	100%	7	1	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
Metals	Barium - Total	7440- 39-3	100%	700	1	μg/L	<lor< td=""><td>0.25</td><td>0.46</td><td>13</td><td>11</td><td>Weekly</td></lor<>	0.25	0.46	13	11	Weekly
	Boron - Total	7440- 42-8	100%	4000	10	μg/L	0.4	0.43	0.48	13	13	Weekly
	Cadmium - Total	7440- 43-9	100%	2	0.1	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
	Chromium - Total	7440- 47-3	100%	50	1	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly

Parameter Group	Parameter	CAS Number	Compliance with Water Quality Limit	Water Quality Limit	Limit of Reporting (LOR)	Unit	Minimum	Mean	Maximum	Count of Samples	Count of positives	Required Testing Frequency
	Copper - Total	7440- 50-8	100%	2000	1	μg/L	<lor< td=""><td><lor< td=""><td>0.001</td><td>13</td><td>1</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>0.001</td><td>13</td><td>1</td><td>Weekly</td></lor<>	0.001	13	1	Weekly
	Iron - Total	7439- 89-6	100%	300	50	μg/L	<lor< td=""><td>0.02</td><td>0.26</td><td>13</td><td>1</td><td>Weekly</td></lor<>	0.02	0.26	13	1	Weekly
	Lead - Total	7439- 92-1	100%	10	1	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
	Manganese - Total	7439- 96-5	100%	500	1	μg/L	<lor< td=""><td>0.003</td><td>0.043</td><td>13</td><td>2</td><td>Weekly</td></lor<>	0.003	0.043	13	2	Weekly
	Mercury - Total	7439- 97-6	100%	1	0.5	μg/L	<lor< td=""><td><lor< td=""><td>0.0002</td><td>13</td><td>1</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>0.0002</td><td>13</td><td>1</td><td>Weekly</td></lor<>	0.0002	13	1	Weekly
	Molybdenum - Total	7439- 98-7	100%	50	1	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
	Nickel - Total	7440- 02-0	100%	20	1	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
	Selenium - Total	7440- 49-2	100%	10	5	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<>	<lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<>	1	0	Quarterly
	Silver - Total	7440- 22-4	100%	100	1	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<>	<lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<>	1	0	Quarterly
	Strontium - Total	7440- 22-4	100%	4000	1	μg/L	0.01	0.53	0.99	13	12	Weekly
	Vanadium - Total	7440- 62-2	100%	50	1	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<></td></lor<>	<lor< td=""><td>1</td><td>0</td><td>Quarterly</td></lor<>	1	0	Quarterly
	Zinc - Total	7440- 66-6	100%	3000	5	μg/L	<lor< td=""><td>0.002</td><td>0.009</td><td>13</td><td>4</td><td>Weekly</td></lor<>	0.002	0.009	13	4	Weekly
Nitrosamines	NDMA (n- Nitrosodimethylamine)	62-75-9	100%	0.1	0.1	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
Nutrients	Ammonia (as N) - Total	7664- 41-7	100%	900	50	μg/L	<lor< td=""><td>0.12</td><td>0.34</td><td>13</td><td>10</td><td>Weekly</td></lor<>	0.12	0.34	13	10	Weekly
	Benzo[a]anthracene	56-55-3			0.01	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
	Benzo[a]pyrene	50-32-8			0.01	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
Polycyclic	Benzo[b+j]fluoranthene	205-99- 2 + 205- 82-3	Limits ap	alv to	0.01	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
Aromatic Hydrocarbons	Benzo[k]fluoranthene	207-08- 9	summed to Concentratio	otal of	0.01	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
Tryurocarbons	Chrysene (Benzo[a]phenanthrene)	218-01- 9	Joinceilli allo	II A IEF.	0.01	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
	Dibenzo[a,h]anthracene	53-70-3			0.01	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
	Indeno[1,2,3-cd]pyrene	193-39- 5			0.01	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly

Parameter Group	Parameter	CAS Number	Compliance with Water Quality Limit	Water Quality Limit	Limit of Reporting (LOR)	Unit	Minimum	Mean	Maximum	Count of Samples	Count of positives	Required Testing Frequency
	PAH (as B(a)P TEF)		100%	0.01	0.01	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
	Lead-210	14255- 04-0			0.1	Bq/L	PEN	PEN	PEN	1	0	Quarterly
	Polonium-210	13981- 52-7	Limits app	oly to	0.002	Bq/L	PEN	PEN	PEN	1	0	Quarterly
Radionuclides	Radium-226	7440- 14-4	summed	total.	0.1	Bq/L	PEN	PEN	PEN	1	0	Quarterly
	Radium-228	15262- 20-1			0.1	Bq/L	PEN	PEN	PEN	1	0	Quarterly
	Total est Radiological Dose (Gamma)		100%	0.5	0.25	Bq/L	PEN	PEN	PEN	1	0	Quarterly
	C6-C9 Hydrocarbons				20	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
Total	C10-C14 Hydrocarbons		Limits app	oly to	50	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
Petroleum	C15-C28 Hydrocarbons		summed	total.	100	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
Hydrocarbons	C29-C36 Hydrocarbons				50	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
	Total Petroleum Hydrocarbons		100%	200	200	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
	Benzene	71-43-2	100%	1	0.5	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
	Ethylbenzene	100-41- 4	100%	300	0.5	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
Volatile Organic	Meta & Para Xylenes	108-38- 3/106- 42-3	100%	600	1	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
Compounds	Ortho-Xylene	95-47-6	100%	600	0.5	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
	Toluene	108-88- 3	100%	800	0.5	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly
	Total Xylene	1330- 20-7	100%	600	1.5	μg/L	<lor< td=""><td><lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<></td></lor<>	<lor< td=""><td><lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<></td></lor<>	<lor< td=""><td>13</td><td>0</td><td>Weekly</td></lor<>	13	0	Weekly

Note *1: The mean has been calculated by interpreting results of less than Limit of Reporting (<LOR) as zero in line with section 2.5.2 of the Public Reporting Guideline for Recycled Water Schemes.

Note *2: 'Count of positives' indicates results recorded above the detection limit.