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Scientific (Pty). Ltd.

LEADERS IN ENVIRONMENTAL MONITORING

OUTA

WATER QUALITY REPORT

Organisation Undoing Tax Abuse
Hammanskraal

November 2018

Compiled by: Aquatico Scientific
(012) 450 3800

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ORGANISATION UNDOING TAX ABUSE (OUTA)
10TH FLOOR, O'KEEFFE AND SWARTZ BUILDING,
318 OAK AVENUE,
FERNDALE
RANDBURG

26 NOVEMBER 2018

WATER QUALITY REPORT BASED ON TEST REPORT 58069

DISCLAIMER

SANAS (South African National Accreditation System) schedule of accreditation for Aquatico: http://www.sanas.co.za/schedules/testing/T0685-11-2018.pdf. Opinions and interpretations expressed herein are outside the scope of SANAS accreditation

INTRODUCTION:

Aquatico was commissioned by Organisation Undoing Tax Abuse (OUTA) to analyse and evaluate the physical, chemical and bacteriological water quality of one submitted sample. The sample was taken by Aquatico and submitted to the Aquatico Laboratory on 03 October 2018.

Water quality is compared against the SANS 241:2015 drinking water standards and the Quality of Domestic Water Supplies limits. The aim of this study was to determine if the submitted water samples were fit for domestic and potable uses.

Water quality is classified according to the WRC Domestic Use (1998) standard classification system (See Table 1). When comparing the data to the guidelines; the worst substance class will determine the overall class of the water supply.

Table 1: WRC Quality of Domestic Water Supplies – Colour classification system.

Class / Colour	Description	Effects
Class 0	Ideal water quality	No effects, suitable for many generations
Class 1	Good water quality	Suitable for lifetime use. Rare instances of sub-clinical effects
Class 2	Marginal water quality	May cause some effects in sensitive users. Some effects possible after a lifetime of use. Aesthetic effects.
Class 3	Poor water quality	Poses risk of chronic health effects, especially in babies, children and the elderly. Poor aesthetics
Class 4	Unacceptable water quality	Severe acute health effects, even with short-term use. Taste and appearance will lead to rejection of the water.

Table 2: Sampling register, Hammanskraal Potable Water, October 2018.

SAMPLING REGISTER : MONTHLY								
PROJECT NAME:		OUTA						
MONTH:		October 2018						
SAMPLER NAME:								
OUTA								
Locality	Description	Coordinates		Sample Time	Status	Flow /Level	Remarks	Lab no
		Latitude	Longitude					
Other								
OUTA Hammanskraal Potable Water		S25.404474	E28.2855	2018-10-03	Yes	Tap	Clear	59377

ORGANISATION UNDOING TAX ABUSE - PHOTOGRAPHIC MONITORING CATALOGUE	
Locality	Hammanskraal Potable Water
Locality Coordinates	S25.404474 E28.2855
Sample Date	2018-10-03
Sampled By	Erick Dorfling

Figure 1: Photographic monitoring catalogue of the water sample taken at the skills & training centre, Hammanskraal, October 2018.

RESULTS:

Table 3: Water quality results from the representative sample collected in October 2018.

VARIABLE	UNITS	ASSESSMENT 1	ASSESSMENT 2	MONITORING LOCALITIES
				OUTA Hammanskraal Potable Water
pH @ 25°C	pH	5.0/9.7	4.5/10.0	7.84
Electrical conductivity (EC) @ 25°C	mS/m	170	150	92.1
Total Dissolved solids @ 180°C	mg/l	1200	1000	586
Chloride (Cl)	mg/l	300	200	73.3
Sulphate (SO_4)	mg/l	500	400	75.9
Nitrate (NO_3) as N	mg/l	11	10	4.66
Nitrite (NO_2) as N	mg/l	0.9	-	2.73
Ammonium (NH_4) as N	mg/l	1.5	-	12
Ammonia (NH_3) as N	mg/l	-	-	0.313
Fluoride (F)	mg/l	1.5	1	0.344
E.coli	CFU/100ml	0	1	0
Total coliform	CFU/100ml	10	10	0
TotalViableCount	CFU/ml	1000	-	4440
Turbidity	NTU	1	1	1.8
Free chlorine (Cl_2)	mg/l	5	0.6	<0.1
Total organic carbon (TOC)	mg/l	10	-	12.8
Temperature	°C	-	-	20.5
Total oxidised nitrogen	mg/l	-	-	7.39
Monochloramine	mg/l	3	-	0.24
Somatic Coliphages	10 ml	-	-	<1
Microcystin	mg/l	1	-	0.32
Cryptosporodium	oöcysts/10l	-	-	0
Giardia	cysts/10l	-	-	0
Acid Soluble Sodium (Na)	mg/l	-	-	77.4
Acid Soluble Aluminium (Al)	mg/l	0.3	-	0.041
Acid Soluble Cadmium (Cd)	mg/l	0.003	-	<0.002
Acid Soluble Chromium (Cr)	mg/l	0.05	-	<0.003
Acid Soluble Copper (Cu)	mg/l	2	-	0.012
Acid Soluble Iron (Fe)	mg/l	0.3	-	<0.004
Acid Soluble Manganese (Mn)	mg/l	0.1	-	0.147
Acid Soluble Nickel (Ni)	mg/l	0.07	-	<0.002
Acid Soluble Zinc (Zn)	mg/l	5	-	<0.002
Acid Soluble Boron (B)	mg/l	2.4	-	0.076
Acid Soluble Barium (Ba)	mg/l	0.7	-	0.032
Acid Soluble Arsenic (As)	mg/l	0.01	-	<0.006
Acid Soluble Selenium (Se)	mg/l	0.04	-	<0.002
Acid Soluble Uranium (U)	mg/l	0.03	-	<0.015

- The physical characteristic of water sample '**OUTA – Hammanskraal Potable Water**' can be described as neutral (pH 6.0 - 8.5) and saline (TDS 450 - 1000 mg/l) (Table 3).
- Based on the presented variables in Table 3 it can be seen that the submitted water quality exceeded the SANS 241-1:2015 drinking water standard limits in terms of the recorded nitrite (NO_2-N), ammonium (NH_4-N), Turbidity (NUT), Total Organic Carbon (TOC) and Manganese (Mn) concentrations. Furthermore the heterotrophic plate count (TVC count), as well as the colour reading also exceeded this guideline.
- The Quality of Domestic Water Supplies (1998) limits were also exceeded in terms of the recorded Turbidity level.
- Remaining heavy metal or trace metal concentrations (illustrated in Table 3 above) were all recorded within satisfactory limits.
- Based on the variables presented in Table 3, the water quality of the submitted '**OUTA – Hammanskraal Potable Water**' sample can be classified as **Good (Class 01)** according to the WRC Domestic Use (1998) standard classification, due to recorded EC/TDS and NTU levels.

DISCUSSION & CONCLUSIONS:

The physical water quality of the submitted water sample could be described as neutral and saline. A relatively high heterotrophic plate count was detected which increases the risk of infectious disease transmission. High TVC counts are usually an indication of inadequate treatment, pot-treatment contamination or after-growth in the distribution system. No Coliforms were detected decreasing the likelihood of the presence of pathogenic organisms.

Residual chlorine levels were below detection limits. It is recommended that the residual chlorine levels at the point of use be maintained at 0.2 – 0.5 mg/l to ensure effective disinfection.

In terms of chemical variables the nitrite (NO_2-N), ammonium (NH_4-N), Turbidity (NUT), Total Organic Carbon (TOC) and Manganese (Mn) concentrations exceeded the Standard Drinking Water (SANS 241 – 1, 2015) limits. Remaining heavy and trace metals were recorded within satisfactory limits.

No somatic Coliphages or parasites were detected and a very low level of microcystin was recorded. All tested trihalomethane (THM) levels were also within satisfactory ranges.

Based on the above mentioned exceedances this water is **not fit for potable use** and treatment is essential.

REFERENCES:

- DWAF, DOH and WRC 1998. Quality of Domestic Water Supplies, Volume 1: Assessment Guide. Second Edition. Water Research Commission Report No. TT 101/98. ISBN No. 1 86845 4169.
- South Africa Bureau of Standards (SABS), 2015. South African national Standard: Drinking Water.

Appendix A

TEST REPORT

aquatico Laboratories (Pty). Ltd.

ilac-MRA sanas Testing Laboratory T0685

Test Report

Client: Organisation Undoing Tax Abuse
Address: 10th Floor, Okeeffe and Swartz Building, 318 Oak Avenue, Ferndale, Randburg
Report no: 58069
Project: OUTA

Date of certificate: 26 November 2018
Date accepted: 03 October 2018
Date completed: 26 November 2018
Revision: 0

Lab no:				59377
Date sampled:				03-Oct-2018
Sample type:				Water
Locality description:				OUTA Hammanskraal Potable Water
	Analyses	**Unit**	**Method**	
A	pH @ 25°C	pH	ALM 20	7.84
A	Electrical conductivity (EC) @ 25°C	mS/m	ALM 20	92.1
A	Total Dissolved solids @ 180°C	mg/l	ALM 24	586
A	Chloride (Cl)	mg/l	ALM 02	73.3
A	Sulphate (SO_4)	mg/l	ALM 03	75.9
A	Nitrate (NO_3) as N	mg/l	ALM 06	4.66
A	Nitrite (NO_2) as N	mg/l	ALM 07	2.73
A	Ammonium (NH_4) as N	mg/l	ALM 05	12.0
N	Ammonia (NH_3) as N	mg/l	ALM 26	0.313
A	Fluoride (F)	mg/l	ALM 08	0.344
A	Acid Soluble Sodium (Na)	mg/l	ALM 30	77.4
A	Acid Soluble Aluminium (Al)	mg/l	ALM 31	0.041
A	Acid Soluble Iron (Fe)	mg/l	ALM 31	<0.004
A	Acid Soluble Manganese (Mn)	mg/l	ALM 31	0.147
A	Acid Soluble Chromium (Cr)	mg/l	ALM 31	<0.003
A	Acid Soluble Copper (Cu)	mg/l	ALM 31	0.012
A	Acid Soluble Nickel (Ni)	mg/l	ALM 31	<0.002
A	Acid Soluble Zinc (Zn)	mg/l	ALM 31	<0.002
A	Acid Soluble Cadmium (Cd)	mg/l	ALM 31	<0.002
A	E.coli	CFU/100ml	ALM 40	<1
A	Total coliform	CFU/100ml	ALM 40	<1
A	TotalViableCount	CFU/ml	ALM 43	4440
A	Turbidity	NTU	ALM 21	1.80
N	Free chlorine (Cl_2)	mg/l	ALM 23	<0.1
A	Total organic carbon (TOC)	mg/l	ALM 63	12.8
A	Acid Soluble Arsenic (As)	mg/l	ALM 34	<0.006
A	Acid Soluble Selenium (Se)	mg/l	ALM 34	<0.002
A	Acid Soluble Boron (B)	mg/l	ALM 33	0.076
A	Acid Soluble Barium (Ba)	mg/l	ALM 33	0.032

A = Accredited N = Non accredited O = Outsourced S = Sub-contracted NR = Not requested RTF = Results to follow NATD = Not able to determine ATR = Alternative test report ; The results relates only to the test item tested.
Results reported against the limit of detection.
Results marked 'Not SANAS Accredited' in this report are not included in the SANAS Schedule of Accreditation for this laboratory.
Uncertainty of measurement available on request for all methods included in the SANAS Schedule of Accreditation.

Client: Organisation Undoing Tax Abuse
Address: 10th Floor, Okeeffe and Swartz Building, 318 Oak Avenue, Ferndale, Randburg
Report no: 58069
Project: OUTA

Date of certificate: 26 November 2018
Date accepted: 03 October 2018
Date completed: 26 November 2018
Revision: 0

Lab no:				59377
Date sampled:				03-Oct-2018
Sample type:				Water
Locality description:				OUTA Hammanskraal Potable Water
	Analyses	**Unit**	**Method**	
A	Acid Soluble Uranium (U)	mg/l	ALM 37	<0.015
N	Temperature	°C	ALM 20	20.5
N	Total oxidised nitrogen	mg/l	ALM 26	7.39
N	Monochloramine	mg/l	ALM 67	0.24
N	Somatic Coliphages	10 ml	OUT	<1
A	Mercury (Hg)	µg/l	OUT	ATR
A	Total Cyanide	mg/l	OUT	ATR
A	Antimony (Sb)	µg/l	OUT	ATR
A	Trihalomethanes (THM)	µg/l	OUT	ATR
A	Color	mg/l	OUT	ATR
N	Microcystin ELISA	mg/l	OUT	0.32
A	Phenol	mg/l	OUT	ATR
A	Cryptosporodium	oöcysts/10l	OUT	<1
A	Giardia	cysts/10l	OUT	<1

A = Accredited N = Non accredited O = Outsourced S = Sub-contracted NR = Not requested RTF = Results to follow NATD = Not able to determine ATR = Alternative test report ; The results relates only to the test item tested.
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Uncertainty of measurement available on request for all methods included in the SANAS Schedule of Accreditation.

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UIS ORGANIC LABORATORY

sanas Testing Laboratory T0419

TEST REPORT
21867A

Test Description: Trihalomethanes
Test Method: UISOL-T-012

Client and Project Information

Client: Aquatico Laboratories Pty Ltd
Address: PO Box 905008, Garsfontein
Pretoria
0042

Attention: Hermie Holtzhausen
Tel: (012) 450 3800
Email: hermie@aquatico.co.za

Project number: Batch No: 58069
Project name: N/A

Sample Information

Sample ID: 59377 OUTA Hammanskraal Potable
Dilution: No Dilution
Container: Glass

Matrix: Water
Storage: Fridge at 0-6°C

Date Received: 2018-10-05
Date Analysed: 2018-10-06
Date Issued: 2018-10-08

PARAMETER	RESULT
Bromoform	<5 µg/liter
Chloroform	<5 µg/liter
Bromodichloromethane	<10 µg/liter
Dibromochloromethane	<2 µg/liter
Trichloroethene (TCE)	<5 µg/liter
Total THMs **	<10 µg/liter

Disclaimers

1) The results only relate to the test items provided, in the condition as received.
2) This report may not be reproduced, except in full, without the prior written approval of the laboratory.
3) Parameters marked " * " are not included in the SANAS Schedule of Accreditation for this laboratory.
4) A = Concentration outside calibration range, O = Outsourced analysis, UTD = Unable to Determine.
5) Uncertainty of measurement for all methods included in the SANAS Schedule of Accreditation is available on request.
6) Total THMs (marked **) is a summation of Bromoform, Chloroform, Bromodichloromethane and Dibromochloromethane.

Reinardt Cromhout
Authorised Signatory

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T0657

WATER RESOURCES:
Microbiology Laboratory

Name of Customer:	AQUATICO Laboratories
Contact Person:	Hermie Holtzhausen
Address:	89 Regency Drive, R21 Corporate Park, Centurion
Tel:	012 450 3800
Date of Analysis:	28/10/2018
Date of Issue:	29/10/2018

Analytical Report

Report No. 180140

Method PMP 1 was used for the concentration and identification of *Cryptosporidium* and *Giardia* in environmental and drinking water samples. The technique is based on the US EPA method 1623.1 and consists of sample concentration, cyst/oocyst separation using immunomagnetic separation (IMS), and microscopic detection using fluorescent antibody (FA) and DAPI staining.

Sample Name	Sample No.	Description of Sample	RESULTS	
			Cryptosporidium Oocysts Count /10ℓ	*Giardia* Cysts Count / 10ℓ
59377 OUTA Hamman	1	Water	0	0

This report relates only to the water samples received on 08/10/2018 on an acceptable condition, and tested by the CSIR Natural Resources and the Environment. The CSIR does not take any responsibility for any matters arising from further use of these results. This report shall not be reproduced except in full without written approval of the laboratory manager. All work is undertaken according to the CSIR General Conditions of contract.

Date: 29/10/2018

Gerrit Idema: .....
SANAS Approved Technical Signatory

CSIR: Implementation Unit
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CSIR Environmental Laboratory - Pretoria

Tel (+27) 012 841 4145
Fax (+27) 012 841 4653/3691
Email MGovenderKirkpatrick@csir.co.za

T0007

Certificate Of Analysis

Report NO:	I-2018-21019	Sample Description:	Water		
Customer:	NRE Pretoria				
Address:	P.O Box 395 Pretoria	No of Samples	1	Sample Condition:	Room Temperature
	0001	Date Received:	08-Oct-2018	Date Completed:	18-Oct-2018
Phone:	012-841 2045				
Contact:	Wouter Le Roux (WleRoux@csir.co.za,LSchaefer@csir.co.za)				

Analysis	Unit	Method	Lab No Sample ID I-18-167710 59377-OUTA Hammanskraal Potable
Antimony	µg/L Sb	CMP 33	0.42
Colour	mg/l Pt	CMP 12 A	22
Cyanide total	mg/l CN	CMP 28	<0.010
Mercury	µg/L Hg	CMP 33	<1
Phenols	mg/l	CMP 28	<0.010

J. Dikobe - Technical Signatory

Date Printed 18-Oct-2018